SAS® Customer Intelligence 360: User’s Guide

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SAS® Customer Intelligence 360: User's Guide

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PART 1

Introduction to SAS Customer Intelligence 360

1

Overview

Access to Components in SAS Customer Intelligence 360

Your license and role determine which parts of SAS Customer Intelligence 360 you have access to. Your license determines the set of functionality that is available to you, and your user role determines the specific menu items and pages that you can access.

How Do I Know Which License I Have?

To find out which licenses are available to you, click ❓ and select **About**.

SAS 360 Discover

Use SAS 360 Discover to collect and analyze web and mobile data about users. The data is loaded into a data warehouse so that it can be used for analysis and reporting. Here are some of the features of this license:

- access to detailed database tables
- access to reports that apply business meaning to data, showing you user trends and transactions

- access to data views and events that you can use to collect data across your sites and mobile applications

You can combine SAS 360 Discover with other licenses to increase the features that you have access to. For example, if you have SAS 360 Discover and SAS 360 Engage: Digital, you can create a web task to deliver content to a website. Then you can use SAS 360 Discover to gain insights about the web content that you are delivering.

SAS 360 Engage: Digital

With SAS 360 Engage: Digital you can deliver content to web and mobile channels. The customer data that this license uses is stored in the cloud. Here are some of the features of this license:

- create segments using your cloud-based customer data
- create tasks to dynamically deliver content to your target audience using mobile and web channels
- create activities to coordinate the tasks that are designed to meet the goals of your marketing campaign
- test content to find the best-performing creatives

You can combine SAS 360 Engage: Digital with other licenses to increase the features that you have access to. For example, if you have SAS 360 Engage: Direct and SAS 360 Engage: Digital, you can create a web task that uses an on-premises segment to define a target audience. If you have SAS 360 Engage: Digital and SAS 360 Plan, you can create planning items that include tasks and activities. For more information about your licenses, see your administrator.

SAS 360 Engage: Direct

SAS 360 Engage: Direct is designed for direct marketing channels that use your on-premises data. Here are some of the feature of this license:

- create segments that use your on-premises data. Use those segments to target users.
- create Direct tasks that combine your on-premises data and analytics from SAS Customer Intelligence 360 to create catalogs and various print marketing material that will be delivered to targeted customers.
- create External tasks that use your on-premises data to send messages and creatives to other campaign systems such as Facebook.

You can combine SAS 360 Engage: Direct with other licenses to increase the features that you have access to. For example, if you have SAS 360 Engage: Direct and SAS 360 Engage: Digital, you can create a web task that uses an on-premises segment to define a target audience. For more information about your licenses, see your administrator.

SAS 360 Engage: Email and SAS 360 Engage: Email Testing

With SAS 360 Engage: Email you can deliver emails to a set of recipients. Here are some of the tasks that you can complete with this license:

- create an email task to deliver information and call-to-action content to your recipient’s inbox
- use email events to capture information about how your recipients interact with email content, such as how many recipients received, opened, clicked, or viewed a link in your email.
- send emails triggered by events in SAS Customer Intelligence 360 or by external events

Note: SAS 360 Engage: Email requires a license for either SAS 360 Engage: Direct or SAS 360 Engage: Digital.

If you have a license for SAS 360 Engage: Email, you can also get a license for SAS 360 Engage: Email Testing. With SAS 360 Engage: Email Testing you can preview email content to ensure it is correct and determine the likelihood that the email is marked as spam by recipients’ inboxes. Here are some of the features in this license:

- eliminate manual testing by previewing email content to see how it is displayed on multiple devices, browsers, email clients, and platforms.
- test your email content across several spam filters to decrease the likelihood that the emails are marked as spam. You can get a score on your email to see how it might perform and correct the content before sending the email.

You can combine SAS 360 Engage: Email with other licenses to increase the features that you have access to. For example, if you have SAS 360 Engage: Email and SAS 360 Engage: Digital, you can orchestrate cross-channel customer journeys including email and web and mobile channels. For more information about your licenses, see your administrator.

SAS 360 Plan

Use SAS 360 Plan to help your marketing department operate more efficiently by integrating and managing end-to-end marketing processes. Here are some of the features of SAS 360 Plan:

- centralize your marketing plans by grouping all of the information that is related to the marketing plans in one place. You can create and approve plans in a centralized repository so that you can easily manage, retrieve them. This feature enables you to plan strategically and collaboratively to ensure that your marketing plan aligns with your organization’s objectives.
- integrated budget and expense management designed to let you monitor finances, track expenses, and automatically update your plans and calendars.
- one calendar that is integrated with your marketing plan and can be used to schedule and track the timing of your plans and tasks for marketing efforts.

- automated workflows to manage assignments and get real-time visibility into project timelines. You can customize the available workflow templates to match your business needs.

You can combine SAS 360 Plan with other licenses to increase the features that you have access to. For example, if you have SAS 360 Plan and SAS 360 Engage: Digital, you can integrate planning, execution, and monitoring of your marketing objectives by associating items used for content creation, omnichannel delivery, and monitoring with your planning items. For more information about your licenses, see your administrator.

License References in This User's Guide

Much of the information that is documented is applicable to more than one user license. As a result, the licenses that apply to a topic are not specified. However, in some parts of the documentation, it is necessary to refer to licenses.

Note: The term "SAS 360 Engage" is used in this user's guide when the documentation applies to all of the following licenses:

- SAS 360 Engage: Digital
- SAS 360 Engage: Direct
- SAS 360 Engage: Email
- SAS 360 Engage: Email Testing

How Roles and Licenses Determine What You See

After your license is purchased, your access is further refined by using roles. There are many user roles available in SAS Customer Intelligence 360, and these user roles determine which parts of the user interface you can access. For more information, see "User Roles" in SAS Customer Intelligence 360: User's Guide.

Note: Only those users who have been assigned to the SAS Administrator role in SAS App Central have access to update roles in SAS Customer Intelligence 360. For more information about roles managed in SAS App Central, see SAS Customer Intelligence 360 Onboarding Guide.

For questions about your access rights, contact the account administrator for your organization.

System Requirements

To see the system requirements for SAS Customer Intelligence 360, click ❓ and select **About**.

Supported Languages

Update the user locale setting so that the user interface is displayed in your preferred language. These languages are supported in SAS Customer Intelligence 360:

- Brazilian Portuguese
- Chinese (Traditional and Simplified)
- English
- French
- German
- Italian
- Japanese
- Korean
- Polish
- Russian
- Spanish

PART 2

Setting Up

2

Settings Overview

About Settings

There are multiple places in SAS Customer Intelligence 360 where you might find settings. Some settings affect user preferences such as locale and are visible only to you. Other settings affect configuration preferences such as domain registration and affect all users.

Settings That Affect User Preferences

User preferences customize your experience with SAS Customer Intelligence 360. You can configure options such as your sign-in screen, locale, and accessibility option by clicking your name on the application bar and selecting **Settings**. For more information, see "Updating User Preferences" on page 12.

Settings That Affect Configuration Preferences

Configuration preferences are available from the navigation bar and affect every user's experience with the product. For example, if you add a domain in **General Settings** ⇨ **Site Configuration** ⇨ **Domains**, then that site can be accessed by anyone using SAS Customer Intelligence 360.

To access these configuration preferences, from within the product, navigate to **Configuration** ⇨ **General Settings**.

Updating User Preferences

There are settings that you can change to customize your experience with SAS Customer Intelligence 360. Changing these settings does not affect other users. To access these preferences, click your name on the application bar and select **Settings**.

Change the Sign-in Screen

By default, the Home page is displayed when you sign in. To change the initial screen to an option other than Home:

1. From the navigation bar, click **Home**.

   Note: Make sure that you click the **Home** link that is on the **SAS Home** page and not the link on the SAS Customer Intelligence 360 home page.

2. Click your user name on the application bar and select **Settings**.
3. Navigate to **Home** ⇨ **Initial Screen**.

   Note: The **Initial Screen** setting is available only from **Home** ⇨ **Settings**.

4. Select another option from the **Set initial screen** list.

Update General Settings

Some of the settings that are available from the **SAS Home** page affect only the **SAS Home** page, and they do not persist on other product pages, such as Tasks, Activities, or the SAS Customer Intelligence 360 home page. As a result, some user preferences need to be set twice. For example, you change the locale by accessing **Settings** from the Home page. When you navigate to Activities, you notice that the locale is no longer set to what you specified from the Home page. This change does not persist because Home acts like a portal from where you can access other applications and products, and Home is a separate component from SAS Customer Intelligence 360. As a result, you might need to make the same change in Settings from within one of the SAS Customer Intelligence 360 pages.

In the **General Settings** page for SAS Customer Intelligence 360, you can specify a different user locale, change the theme, or reset messages.

- By default, the user locale is set to match your browser locale. The user locale specifies the geographic region whose language and conventions are used in the applications. If you do not want your user locale and browser locale to be the same, change the value of the **User locale** setting.

- The SAS Corporate theme is the default theme. If available, you can select another theme to change the look of the applications in the **Theme** setting.
- If you want to start seeing a message type or warning type that you previously chose to hide, click **Reset Messages**. By default, all warnings and messages are displayed.

Accessibility

To customize accessibility settings, click your name in the application bar and select **Settings**. In the **Settings** menu, navigate to the **Accessibility** section.

Note: These settings are in the SAS Customer Intelligence 360 product. There are similar settings available from the **SAS Home** page.

- Select **Enable sounds** to hear audio indicators for events that occur within the user interface.
- Select **Enable visual effects** to show animations that indicate state changes. For example, if this setting is enabled when you delete an item, a subtle animation is shown when you remove the item.
- Select **Invert application colors** to make the user interface easier to see for users with sensitivity to certain bright colors (for example, a black-on-white display). You can also use the Ctrl+` (Ctrl+back quote) keyboard shortcut to invert the application colors.

  Note: The in-field hint text might not be visible unless you increase the contrast on your browser or computer monitor.
- Select **Display tooltips when using the keyboard to navigate** to enable keyboard-only users to access tooltips. If this option is enabled, focusing on a control also displays the tooltip on the screen. By default, this option is not selected and a mouse is required to see a tooltip.
- Make the focus indicator easier to see by selecting **Customize the focus indicator settings** and adjusting the color, thickness, and opacity. If you cannot see the focus indicator after customizing it, try updating your computer's accessibility settings to change how the focus indicator is displayed.

For more information, see SAS Customer Intelligence 360: Accessibility Features.

Configuring SAS Customer Intelligence 360

Enable users such as marketers, business analysts, and designers to create the items that SAS Customer Intelligence 360 uses to deliver content and collect and analyze data.

Note: Only users with administrative privileges can see the data collection settings.

1 Prepare the site that you want to collect data for.
   - Verify that load balancing works as intended and site traffic is manageable.

- Ensure that all elements in your HTML have unique IDs.
- Review the supported media types and adjust your web pages accordingly.

For more information, see “Preparing Your Site” on page 15.

2 For each page that you want to monitor, insert the SAS tag (a JavaScript tag that references a file that is downloaded to a visitor's browser) into your site's HTML. The tag enables you to collect a user's web behavior and enables web personalization and digital marketing. For more information, see “Preparing Your Site” on page 15.

3 Define your domain so that SAS Customer Intelligence 360 can collect data on the pages in the domain. For more information, see “Domains” on page 20.

4 Assign predefined roles to users. Any user that is a member of a role has all of that role’s capabilities. For more information, see “Assign Roles to a User” on page 84.

5 Import customer and location data to make this information available to SAS Customer Intelligence 360.

   a Define a data descriptor so that SAS Customer Intelligence 360 knows how to parse your data files. For more information, see “Creating an Import Descriptor” on page 185.

   b Upload your customer data files. For more information, see “Data Sources” on page 23.

6 Identify users so that when they enter information that is recognized, you can map their interactions to their user profiles. For more information, see “User Identities” on page 87.

7 (Optional) Deactivate any event types that you do not want to collect data from. For more information, see “Events” on page 34.

8 (Optional) Set page and session settings to configure session options such as page active time and session time-out. For more information, see “Page and Session” on page 34.

9 (Optional) Specify to collect data either from all forms or from forms that match rules that you define. For more information, see “Form Fields” on page 40.

10 (Optional) Configure settings such as Do Not Track (DNT) and IP address so that you can define how to determine a customer's location. For more information, see “Personally Identifiable Information” on page 42.

Note: By default, SAS Customer Intelligence 360 ignores the DNT setting and locates and stores a visitor's entire IP address.

11 (Optional) Upload assets so that your users can start creating messages. For more information, see “Upload a Batch of Assets” on page 427.

12 (Optional) Register your mobile application, activate data collection, and enable push notification services. For more information, see “Creating a Mobile Application” on page 385.

13 (Optional) Create email send agents to establish a connection to an outbound mail server for the delivery of emails. For more information, see “Email Settings” on page 44.

14 (Optional) Create templates that are used for exporting data in a direct marketing task. For more information, see "Exporting Data in a Direct Marketing Task" on page 51.

15 (Optional) Create an access point that can be used to interact with SAS Customer Intelligence 360 data, create an API user for use in external systems, and specify the external applications that can send events to SAS Customer Intelligence 360. For more information, see Chapter 6, "External," on page 53.

16 Specify how a code is generated for each Engage or Plan item. For more information, see "Specifying Code Settings" on page 101.

17 (Optional) Configure analytic settings. For example, update the preferences for running A/B tests, discovering segments, and creating segment profiles. For more information, see Chapter 10, "Analytics," on page 103.

18 Required for SAS 360 Discover only: Define data collection rules to collect data that can be exported for analysis in other SAS solutions such as SAS Adaptive Customer Experience. For example, you can define collection rules for generating demographic information or for tracking individual behavior patterns. For more information, see "About Events and Collecting Data" on page 299.

Preparing Your Site

Prerequisites

Before SAS Customer Intelligence 360 can start monitoring your site for events and collecting behavioral data, you need to edit your site's source code and configure some basic settings.

To prepare the site that you are going to collect data for:

1 Verify that load balancing is working as intended and site traffic is manageable.

2 Ensure that all elements in your HTML have unique IDs.

3 Ensure that your pages do not include more than one <meta> tag with the same name. This rule is especially important to verify if you created your site with WordPress or similar tools.

4 Review "Collecting Data from Media" on page 349 and make adjustments to your web pages as necessary.

Adding the SAS Tag

Insert the JavaScript

For each page that you want to monitor, insert the SAS tag in your site's HTML. The tag enables you to collect a client's web behavior and enables web personalization and digital marketing.

Follow these instructions to get the JavaScript code to insert:

1. Click **General Settings** on the navigation bar and select **Site Configuration ⇨ SAS Tag Instructions**.

2. Copy the JavaScript code on the **SAS Tag Instructions** page. Add the code to the head tag of your site's pages (loading it as early as possible). The JavaScript function is similar to this example:

```
<script>
(function() {
  var ot = document.createElement('script');
  ot.type = 'text/javascript'; ot.id = 'ob-script-async'; ot.async = true;
  ot.src = 'https://<server>.sas.com/js/ot_boot-min.js';
  var a = document.createAttribute('a');
  a.nodeValue = '83a61275aa00013aa39c7b62'; // This value is your external tenant I
  ot.attributes.setNamedItem(a);

  var s = document.getElementsByTagName('script')[0];
  s.parentNode.insertBefore(ot, s);
  })();
</script>
```

   When you view these instructions in the user interface, the server variable is populated with the actual server address.

   CAUTION! Do not modify the SAS tag with additional logic or code. Modifications to the SAS tag are not supported and might cause issues with its operation. Contact your SAS representative if you have a special case that needs to be considered.

SAS Customer Intelligence 360 uses a class attribute to hide page elements while spot content is loaded. If spots cannot be filled, elements are unhidden after two seconds. Unhiding elements prevents spots from flickering while content is loading from the DAM, and as a result it might improve page performance.

By default, the class attribute is "sas-ci360-hidden", but you can use a custom class by changing the hiddenClass variable in the SAS tag. Add this code above the line that contains `var s`:

```
var hiddenClass = document.createAttribute('hiddenClass');
hiddenClass.nodeValue = 'hidden-element'; // Change 'hidden-element'
                                          // to your custom value.
ot.attributes.setNamedItem(hiddenClass);
```

Elements must use the attribute value exactly (including case sensitivity), but elements can include other class attributes, too. For example, assume you set hiddenClass to "hidden-element". In this case, `<div class="hidden-element nice-bg-color"/>` is hidden, but `<div class="hidden-element01"/>` is not hidden.

Capturing Sessions That Cross Domains

If your customers interact with your sites across multiple domains, you want to capture this behavior in a continuous session to get the most comprehensive view of the customer.

In most cases, you can add the SAS tag with your tenant ID to both sites, and SAS Customer Intelligence 360 joins user data across those domains with no extra setup. As long as the customer accepts third-party cookies, SAS Customer Intelligence 360 tracks them as a single session across both domains.

Some situations might require a more advanced approach. For example, if you run a large enterprise site with thousands of third-party vendors, you might not want each vendor to embed its tag directly on your site's pages. In this case, one solution might be to code an iFrame that contains the SAS tag, and you explicitly pass attributes to the iFrame. You might also need to write some custom script to ensure that the SAS tag is monitoring the iFrame for information that it has access to. However, in this example, the SAS tag—and therefore SAS Customer Intelligence 360—is not able to access other attributes such as page elements.

If you think you need to use a more advanced method for your sites, contact your SAS support representative to determine the best solution.

Using a Tag Management System

Tag management systems enable you to manage how you include multiple JavaScript tags for your site's pages. The SAS tag can be added to your tag management system and managed alongside other tags. For example, Telium iQ Tag Management (external link) includes the SAS tag as one of their tag options.

3

Site Configuration

Update the settings that impact how your site interacts with SAS Customer Intelligence 360.

SAS Tag Instructions

For each page that you want to monitor, insert the SAS tag in your site's HTML. The tag enables you to collect a client's web behavior and enables web personalization and digital marketing.

Follow these instructions to get the JavaScript code to insert:

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2 Copy the JavaScript code on the **SAS Tag Instructions** page. Add the code to the head tag of your site's pages (loading it as early as possible). The JavaScript function is similar to this example:

```
<script>
(function() {
  var ot = document.createElement('script');
  ot.type = 'text/javascript'; ot.id = 'ob-script-async'; ot.async = true;
  ot.src = 'https://<server>.sas.com/js/ot_boot-min.js';
  var a = document.createAttribute('a');
  a.nodeValue = '83a61275aa00013aa39c7b62'; // This value is your external tenant I
  ot.attributes.setNamedItem(a);

  var s = document.getElementsByTagName('script')[0];
  s.parentNode.insertBefore(ot, s);
  })();
</script>
```

When you view these instructions in the user interface, the server variable is populated with the actual server address.

CAUTION! Do not modify the SAS tag with additional logic or code. Modifications to the SAS tag are not supported and might cause issues with its operation. Contact your SAS representative if you have a special case that needs to be considered.

SAS Customer Intelligence 360 uses a class attribute to hide page elements while spot content is loaded. If spots cannot be filled, elements are unhidden after two seconds. Unhiding elements prevents spots from flickering while content is loading from the DAM, and as a result it might improve page performance.

By default, the class attribute is "sas-ci360-hidden", but you can use a custom class by changing the hiddenClass variable in the SAS tag. Add this code above the line that contains `var s`:

```
var hiddenClass = document.createAttribute('hiddenClass');
hiddenClass.nodeValue = 'hidden-element'; // Change 'hidden-element'
                                          // to your custom value.
ot.attributes.setNamedItem(hiddenClass);
```

Elements must use the attribute value exactly (including case sensitivity), but elements can include other class attributes, too. For example, assume you set hiddenClass to "hidden-element". In this case, `<div class="hidden-element nice-bg-color"/>` is hidden, but `<div class="hidden-element01"/>` is not hidden.

Domains

About Domains

Domains are classified in two primary categories: approved (active or inactive) and unapproved. Data collection depends on which category a domain is included in.

Approved
: Domains that you explicitly defined (or approved from the unapproved list). These are domains that you know traffic is going to come from.

- Active domains are approved domains that you want to collect data for.
- Inactive domains are approved domains that you do not want to collect data for. Possible reasons are because you want resources for a rush on another domain or you want to suspend collection from that domain.

Unapproved
: Traffic coming from sources that are not defined. Domains that are not defined are unapproved by default.

Define a Domain

After your site includes the SAS tag and is ready to collect data, you need to define the domain of the site to monitor. When you define a domain, any data that is collected from that domain is associated with the definition that you provided.

1 From the navigation bar, click **General Settings** and select **Site Configuration ⇨ Domains**.

2 Click and complete the fields on the **Domain** page.

On the **Domain** page, complete these actions:

- activate or deactivate data collection.
- specify a default path for elements in that domain.
- create rules to exclude data collection from certain elements. You can use keywords or regular expressions in this field.

Here is an example of values that you can use to define a domain:

Table 3.1 Domain Definition

Name	Value
Domain	www.mysite.com Note: Do not include a protocol (for example, http://), path (for example, mysite.com/some_path), or port number (for example, www.mysite.com:7556) in the **Domain** field.
Default URL	https://www.mysite.com/homepage#lnk=gnavweeklyad
Data Collection Status	Active

Here is an example of an exclusion rule that you can define that excludes any "admin" pages from being tracked:

Table 3.2 Exclusion Rule for a Domain

Name	Value
URL path	**Contains** `admin`

3 (Optional) Set the domain as the default in the **Approved Domains** list. When you set a domain as the default, that domain is used to automatically populate the domain fields for configuration rules for other data collection settings.

Activate or Deactivate a Domain

You can suspend data collection for one or more sites if you want SAS Customer Intelligence 360 to stop monitoring it. For example, a site might be offline for a few days for maintenance and you no longer need to use resources to monitor it. In another case, you might have a promotion for one site that generates heavy customer traffic, and you want to deactivate other domains and focus data collection and processing on that site.

To suspend data collection for a domain that you defined:

1 Select a domain from the **Approved Domains** list.

2 Set the status to **Inactive** on the **Edit Domain** page.

To activate, deactivate, or delete multiple domains at the same time:

1 Click **Select** on the **Approved Domains** list.

2 Select one or more domains in the list, or select the checkbox at the top of the list to select all domains.

3 Click **Activate**, **Deactivate**, or 🗑, depending on the action that you want to take.

Manage Unapproved Domains

If you implement a site with a SAS tag without defining a domain for the site, the data is collected in the **Unapproved Domains** section of the **Manage Domains** page.

To approve a domain that is not defined:

1 Select a domain from the **Unapproved Domains** list.

2 Click **Approve**.

To delete entries from the list of unapproved domains:

1 Click **Select** in the **Unapproved Domains** table.

2 Select one or more domains.

3 Click 🗑.

4

Data Management

Update the settings that impact how data is collected.

Data Sources

The **Data Sources** page displays a table that contains the existing data descriptors in your environment. Data descriptors describe the structure of a data set and how SAS Customer Intelligence 360 should process the contents. For every data set that you want to import, there must be a corresponding data descriptor in this table.

Note: If you click a data descriptor in the table, the **Upload** dialog box is used to import data that is associated with that descriptor. To update the import descriptor, you must use the REST API.

Uploading Customer Data

Import customer data to use in targeting, segments, and personalization. If you would rather use the REST API to import data, see “Importing Data through the REST API”.

To upload customer data through the user interface:

1 Before you submit an import job, ensure that your import data follows these guidelines:
   - Remove any duplicate customer records from your data tables. Customer records must be unique for each identifiable person.
   - Select a file type and structure that matches the data descriptor:
     - The file must use UTF-8 encoding.
     - Only CSV files are currently supported.
   - When you import data through the user interface, ensure that your file includes a header row. If you import data with the REST API, you can specify whether a header row exists when you set up the import.

2 From the navigation bar, click **General Settings** and select **Data Management** ⇨ **Data Sources**.

3 If you know the import descriptor that you want to use, complete these steps:

   a Click the name of the import descriptor in the table. If you need to create or update a data descriptor, see “Managing Data Descriptors”.

   b In the **Upload New File** dialog box, click **Browse** to select the data file on your system.

   c Choose the upload method.

   > **TIP** Select **Update** unless you have a specific reason to use a different method. The update method can perform Replace operations and Append operations as needed.

   d Click **OK** to submit the import job.

4 If you need to filter the import descriptors based on the type, complete these steps:

   a Click and select **Customer**.

   b Select an existing data descriptor from the table. If you need to create or update a data descriptor, see “Managing Data Descriptors”.

   c Click **Browse** and locate the file on your local system.

   d Click **Upload Data** to schedule the upload job.

Uploading Location Data

Beacons are transmitters that can be used to deliver proximity-based, context-aware messages. A beacon transmits signals that lets a user’s mobile device determine its proximity to the broadcaster. A *geofence* is a virtual geographic boundary that enables software to trigger a response when a mobile device enters or leaves an area of interest. A geofence can contain several beacons. In order to report region changes in a timely manner, the region that is monitoring service requires network connectivity.

There is a limit of 20 regions in the geofence definition data descriptor in use at any one time for both iOS and Android. SAS Customer Intelligence 360 reserves the first region (of the 20), which is used as an overarching boundary for all locations of interest. Within this first region, there are 19 geofences that can be defined. In order to stay within iOS and Android limits for regions and to optimize the number of regions defined, follow these guidelines:

- Beacon UUIDs need to be the same within a single geofence (in the upload file).
- Geofences must be larger than 100 meters.

  Note: If you define a large geofence that encompasses places where your customers might spend a lot of time (for example, home, work, school), remember that the detection of this geofence might always be "on". This definition could have a negative impact on the battery level of your customers' device.
- Geofences cannot overlap.
- Select a file type and structure that matches the data descriptor. Only CSV files are currently supported.

Note: In iOS 6, regions with a radius between 1 and 400 meters work better on iPhone 4S or later devices. On these devices, an app can expect to receive the appropriate region entered or region exited notification within 3 to 5 minutes on average, if not sooner.

For more information about working with location data, see the appropriate section of the Apple Developer website (external) or the Google Developer website (external).

To upload beacon or geofence data through the user interface:

1 Before you start the import process, ensure your data file has all the necessary information:

   - The CSV file must contain 13 column headings. All column headings are required.
   - The following columns must be populated before the file can be uploaded: mobile_appid, latitude, longitude, radius, and geofence_name.

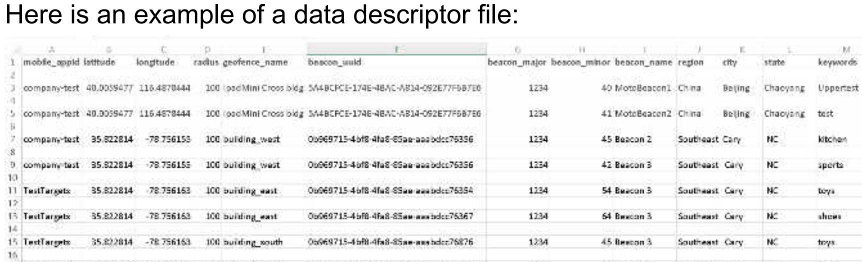
   This table describes the columns and data that should be in the imported file:

   Table 4.1 Data Descriptor Column Headings

Column Heading	Type	Description
mobile_appid	String	The ID of your registered mobile app. For more information, see “Register a Mobile Application”. Must be populated.
latitude	Number	Up to six digits after the decimal, ranging from MIN to MAX (for example, 49.420432). Must be populated.
longitude	Number	Up to six digits after the decimal, ranging from MIN to MAX (for example, –78.754268). Must be populated.

Column Heading	Type	Description
radius	Integer	Min value: 100 meters Max value: 10,000 meters Must be populated.
geofence_name	String	Up to 100 characters in length. Must be populated.
beacon_uuid	String (unique)	Determined by the manufacturer of the beacon device.
beacon_major	Integer	Determined by the manufacturer of the beacon device. Leave blank if you are using only geofences.
beacon_minor	Integer	Determined by the manufacturer of the beacon device. Leave blank if you are using only geofences.
beacon_name	String	Up to 60 characters in length. Leave blank if you are using only geofences.
region	String	Up to 60 characters in length (for example, Southeast).
city	String	Up to 60 characters in length (for example, Cary).
state	String	Up to 60 characters in length (for example, NC).
keywords	String	Up to 100 characters in length. Space delimited (for example, shoes).

Here is an example of a data descriptor file:



mobile_appid	latitude	longitude	radius	geofence_name	beacon_uuid	beacon_major	beacon_minor	beacon_name	region	city	state	keywords
company-test	40.0039477	116.4878444	100	ipadMini Cross bldg	5A4BCFCE-174E-4BAC-A814-092E77F6B7E6	1234	40	MotoBeacon1	China	Beijing	Chaoyang	Uppertest
company-test	40.0039477	116.4878444	100	ipadMini Cross bldg	5A4BCFCE-174E-4BAC-A814-092E77F6B7E6	1234	41	MotoBeacon2	China	Beijing	Chaoyang	test
company-test	35.822814	-78.756153	100	building_west	0b969715-4bf8-4fa8-85ae-aaabdcc76356	1234	45	Beacon 2	Southeast	Cary	NC	kitchen
company-test	35.822814	-78.756153	100	building_west	0b969715-4bf8-4fa8-85ae-aaabdcc76356	1234	42	Beacon 3	Southeast	Cary	NC	sports
TestTargets	35.822814	-78.756163	100	building_east	0b969715-4bf8-4fa8-85ae-aaabdcc76354	1234	54	Beacon 3	Southeast	Cary	NC	toys
TestTargets	35.822814	-78.756163	100	building_east	0b969715-4bf8-4fa8-85ae-aaabdcc76367	1234	64	Beacon 3	Southeast	Cary	NC	shoes
TestTargets	35.822814	-78.756163	100	building_south	0b969715-4bf8-4fa8-85ae-aaabdcc76876	1234	45	Beacon 3	Southeast	Cary	NC	toys
TestTargets	35.822814	-78.756163	100	building_south	0b969715-4bf8-4fa8-85ae-aaabdcc76366	1234	67	Beacon 3	Southeast	Cary	NC	toys

2 From the navigation bar, click **General Settings** and select **Data Management ⇨ Data Sources**.

3 If you know the import descriptor that you want to use, complete these steps:

a Click the name of the import descriptor in the table. If you need to create or update a data descriptor, see “Managing Data Descriptors”.

b In the **Upload New File** dialog box, click **Browse** to select the data file on your system.

c Choose the upload method.

> **TIP** Select **Update** unless you have a specific reason to use a different method. The update method can perform Replace operations and Append operations as needed.

d Click **OK** to submit the import job.

4 If you need to filter the import descriptors based on their type:

a Click and select **Location**.

b Select an appropriate data descriptor (geofence_definition). If you need to create or update a data descriptor, see “Managing Data Descriptors”.

c Click **Browse** and locate the file on your local system.

d Click **Upload Data** to schedule the upload job. A message is displayed stating that the existing data associated with the data descriptor is overwritten. Click **Yes**.

After the data is uploaded, all mobile apps that have the mobile SDK deployed must have a focus event where users open the app at least once. This action triggers their devices to get the most recent list of locations of interest (beacons, geofences). Location Services must also be enabled on the devices. The upload should take only a few minutes, but you can view the **Job Information** page to check the status of your upload.

Managing Data Descriptors

Create a Data Descriptor

When you create a data descriptor to import data, you must use the REST API to upload the descriptor. The following steps describe the basic procedure for creating a data descriptor. To see these steps in context with the other topics that explain the required attributes, see Chapter 20, “Importing Data,”.

To create a data descriptor:

1 Open a text editor and create a basic template for your descriptor. You can use text similar to this example:

```
{
  "name": "",
  "description": "",
  "type": "",
  "dataItems": [
    {
      "name": "",
      "label": "",
      "description": "",
      "type": "",
      "tags": []
    },
    {
```

```
            "name": "",
            "label": "",
            "description": "",
            "type": "",
            "tags": []
          }
        ]
      }
```

2 Define the top-level attributes. For more information, see "Import Descriptor Attributes".

3 Define a data item for each column of your input data. For more information, see "Data Item Attributes".

4 (Optional) Modify attributes to use merge tags with imported data. Merge tags enable you to personalize messages and creatives for specific members of the audience. You can use merge tags to dynamically retrieve personalized information about your recipient (such as his or her first name). This information can then be used to customize the content of a task.

   To make your imported data available to merge tags, set these properties in the data descriptor:

   a Add the EMAIL_CONTACT field tag to a data item that contains email addresses.

   b Set the channelContactInformation attribute to `true` for the data item.

   > **TIP** If you have data that could be used for merge tags but are unsure, add the channelContactInformation property just in case you do decide to use the data later.

5 (Optional) Modify attributes for segmentation. Set these attributes to control how SAS Customer Intelligence 360 uses your data in segment discovery, segment creation, and targeting:

   a Set the type attribute for the data descriptor object (the top-level element) to `customer`.

   b For best results, set these values for each dataItems property in the data descriptor:

Table 4.2 Property Settings for Segmentation

Property	Recommended Value	Description
segmentation	true	Enables an item to be used as criteria when you define a segment in the UI.

Property	Recommended Value	Description
excludeFromAnalytics	false	If the value is **true**, then analytics cannot view the property. So, the user record cannot be part of a discovered segment criteria or segment profiles. Segment profiling still runs using that criteria to define the segment and the population, but that record is not part of the resulting analysis.
segmentProfilingField	true	Enables the system to use this record for segment profiling.

To illustrate how these settings interoperate and affect your data, assume that you have dataItems properties for "gender" configured as follows:

- `"segmentation": true`
- `"excludeFromAnalytics": true`

If you use the condition "gender=F" to define a segment, then analytics uses that criteria to split the data in half (in the segment and in the population). However, gender is not profiled by analytics and gender does not appear in any discovered segments. If the segmentation property is set to **false**, then analytics does not process it regardless of the value of the excludeFromAnalytics property.

This granular design enables you to explicitly define segments that were discovered by analytics in a task. If the segmentation property is set to **false**, then you cannot define that segment. This means that analytics is discovering segments that you cannot use for future targeting.

6 Upload the import descriptor. Use this REST call:

```
POST https://design-<server>/SASWebMarketingMid/rest/descriptors/
```

In the body of the REST call, paste the JSON code for the import descriptor.

Follow these guidelines when you submit a REST call:

- When you include JSON data in the body, set the Content-Type header value to **application/json**. How you set this value depends on the REST client.
- You must be authenticated with SAS Customer Intelligence 360. In most cases you can submit authentication information through your REST client.

If you receive an OK (response code 200) as a response, the upload was successful. If you need to update a descriptor, see "Update an Import Descriptor".

Update a Data Descriptor

To update an existing data descriptor, you must use the REST API.

Complete these steps:

1 Find the ID (the **id** value) for the data descriptor that you want to update:

```
GET https://design-<server>/SASWebMarketingMid/rest/descriptors/<import_descriptor_ID>
```

> **TIP** If you know the name of your descriptor, you can retrieve it with this REST call:
>
> ```
> GET https://design-<server>/SASWebMarketingMid/rest/
>    descriptors?name=<descriptor_name>
> ```

If you do not know the ID or name, you can review the list of descriptors:

```
GET https://design-<server>/SASWebMarketingMid/rest/descriptors
```

2 Copy the descriptor's contents from the JSON response to the GET call.

3 Edit the data items that you want to update. You can change these data items in a descriptor:

- channelContactInformation
- customProperties
- description
- delimiter
- identityAttribute
- key
- label
- predefinedValues
- segmentation

  Note: If excludeFromAnalytics is set to **false** (that is, analytics is aware of this data), you cannot change the segmentation value from **true** to **false** after it is set.
- segmentProfilingField
- tags
- uniqueValuesAvailable

4 Use a POST call to update the descriptor.

a Use the PATCH method in the POST call's URL:

```
POST
   https://design-<server>/SASWebMarketingMid/rest/descriptors/
   <import_descriptor_ID>?_method=PATCH
```

Note: Be sure to include the underscore (_) in the URL.

b Include the updated descriptor as the JSON body for the POST call.

Note: If you attempt to update a field that cannot be changed, the request to change that field is silently ignored.

5 (Optional) Verify your updates by reviewing the contents of the descriptor. Use a GET call with the descriptor's ID:

```
GET https://design-<server>/SASWebMarketingMid/rest/descriptors/<import_descriptor_ID>
```

Defining Custom Properties

See “Custom Properties”.

View Status of Import Jobs

To view the status of import jobs that are initiated through the user interface:

1. On the top navigation bar, click . The **Job Information** page lists your submitted jobs. You can click **Processes** to view the batch jobs.

   The job status is indicated by these icons:

   - indicates the job completed successfully.
   - indicates the job failed.
   - indicates the job is in progress.

2. To view the details of a job, click . The **Job Details** page shows the list of successes and errors for the job. Errors are grouped by the type of error message.

   For customer imports, the following information is displayed about each job:

   Table 4.3 *Details about Import Job*

Name	Description
Import Details	The import request ID, the data descriptor ID, and the table name that was imported.
Import Validation	The validation status. When the data is validated, this field displays the date and time at which validation completed.
Data Processing	The status of data processing. When processing is complete, this field displays this information: ■ the date and time at which processing completed ■ the total number of records that were uploaded

Name	Description
Identity Processing	Detailed information about how identity information was processed. The date and time of completion is also displayed. These categories are displayed: Total Number of Records Processed The number of identity records that were processed. Total Number of Records Not Processed The total number of records that could not be processed successfully. Error messages include information about the column that caused the problem, invalid characters in a field value, names of missing columns, and data type mismatches. Total Number of Identities Rejected The number of identity records that were rejected. These records were processed successfully but were not converted to identity IDs in the data hub. Total Number of Identities Created The number of identities (with corresponding IDs) that are created as a result of the data import. This number includes only identities that are from records that are successfully processed. Total Number of Identities Updated The number of identity IDs that are updated as a result of the data import. Updated identity IDs are existing IDs that are updated because of a mapping or merge of an identity type into the ID. This number includes only IDs that are updated from rows that are successfully processed. Total Number of Identities Deleted If the import data descriptor was a deleteList type, then this field displays the number of identities that were deleted successfully. If there are import failures, use the REST API to download a CSV with the failed rows.
Input File Processing	The percentage of the input file that has been processed.

Name	Description
Overall Import Status	The overall status of the import request. When the import is complete, this field displays the date and time at which the job finished. These are the possible statuses in their sequential order: CREATED The import request has been successfully created. VALIDATING Import resources are being validated. These statuses can follow the VALIDATING status: VALIDATED The imported resources are successfully validated. FAILED_VALIDATION One or more resources failed validation. Data processing is stopped. PROCESSING The import request is being processed, and that data is being loaded into the data warehouse. These statuses can follow the PROCESSING status: COMPLETE Data is successfully loaded into the data warehouse. IMPORTED Data was successfully imported. This status is displayed at this point only when the input data does not contain identity data. FAILED Data could not be loaded into the data warehouse successfully. Data processing is stopped. PROCESSING_IDENTITIES Identity data is being processed. These statuses can follow the PROCESSING_IDENTITIES status: SYNCING_IDENTITIES Identity data is being synchronized with data in the data warehouse. COMPLETED_IDENTITIES Identity processing is complete. FAILED_IDENTITIES Processing failed when the system was processing identity data. IMPORTED Data was successfully imported. The data is ready to be used.

3 (Optional) Click **Download the Upload Summary** to download a text version of the details.

4 (Optional) Click 🗑 to delete a job. You cannot delete a job in progress.

5 Click **Close**.

Events

The settings page for **Events** enables you to quickly enable or disable collection for specific types of events. If you deactivate an event type on this page, any rules or configurations that are defined for that type are not used.

1 From the navigation bar, click **General Settings** and select **Data Management** ⇨ **Events**.

2 Activate or deactivate an event type to control data collection for that type.

   Note: By default, **Field Interactions** and **Form Submits** are not enabled. If you want to collect data from these types, enable these options and review the settings on the **Data Management** ⇨ **Form Fields** page. For more information, see “Form Fields”.

3 (Optional) Add rules to the **Data Collection Exclusion Rules** section to exclude specific types of events from being monitored. For example, you can set exclusion rules to ignore traffic from specific locations, IP addresses, or browser types. Exclusion rules apply to all events in the session.

   Note: Exclusion rules for data collection are case insensitive. Double-byte characters are not supported for this rule type. If a URL contains double-byte characters, use the ASCII-encoded URL path instead.

Note: In addition to these rules, there are other situations in which SAS Customer Intelligence 360 cannot collect data. For more information, see “When Data Cannot Be Collected” on page 303.

Page and Session

The **Page and Session** page is where you define values for pages and sessions, specify the spots that are eligible for selection, and supply HTML content from your site. For page active time and session duration settings, you can set different values depending on whether visitors are using your website or a mobile app.

Click **General Settings** on the navigation bar and select **Data Management** ⇨ **Page and Session**.

Set Page Active Time

Specify the amount of time that a page is active on a website or mobile app.

Set Session Duration for Data Collection

This setting controls the time period that is used to calculate metrics for data collection records.

Note: This setting controls only the session duration for data that is collected for SAS 360 Discover. This setting does not control how other features use session duration. For example, impression limits for web tasks are set at the task level.

Session duration and page active time are based on different starting points, so their values might be different depending on which events a customer triggers on a page. For example, assume that there are three events related to a page loading:

1. page load event
2. new session event
3. load event

The session duration is calculated from the new session event, but the page active time (the time difference between a load event and any subsequent events) is not calculated until an event takes place after the load event. In situations where there are no events after the load event, the session duration would continue to increment, but the page active time would remain 0.

Set Maximum Session Duration

Set the maximum amount of time that a session can remain open. If events occur in the same session after the maximum period has elapsed, they are considered part of a new session.

Note: This setting controls only the session duration for data that is collected for SAS 360 Discover. This setting does not control how other features use session duration. For example, impression limits for web tasks are set at the task level.

Set Page ID

Enter a JavaScript variable that can be used to detect the ID of a web page. This value is optional.

Specify Eligible Spot Elements

By default, any element can be defined as a spot on a web page.

Complete these steps to limit the elements that are available to select as spots:

1 Select **Only elements matching a specified selector can be defined as a spot**.

2 Enter the selector that the element must contain in order to be defined as a spot. For example, to identify elements that are assigned to the sas-replaceable class, enter `.sas-replaceable`.

If you are a web developer, you can create a subset of eligible elements by modifying the HTML for the pages on your site. Assign special CSS classes to the DIV elements that can contain personalized content. For example, you can assign a CSS class that is named `sas-replaceable`.

Then, when the user creates a spot, only those spots with the defined selector are available for selection. In Figure 4.1, only Spot 7 is available for selection.

Figure 4.1 Eligible Spot

You can select an eligible spot element. In Figure 4.2, `.sas-replaceable-id-7` is selected in the HTML code.

Figure 4.2 HTML Code for Eligible Spot

```
▶ <div>…</div>
  <div class="sas-replaceable sas-replaceable-id-">Here is more generic content that should be replaced</div>
▶ <div class="row">…</div>
▶ <div class="row">…</div>
▼ <div class="row">
    ::before
  ▶ <div class="col-xs-4">…</div>
    <div class="col-xs-4"> </div>
  ▶ <div class="col-xs-4">…</div>
  ▶ <div class="col-xs-4">…</div>
    <div class="col-xs-4">Not replaceable</div>
  ▼ <div class="col-xs-4">
      <div class="sas-replaceable sas-replaceable-id-7">replaceable</div> == $0
    </div>
    ::after
  </div>
```

Set the Browser Sandbox Attribute

SAS Customer Intelligence 360 uses an inline browser to display content when you perform tasks such as previewing creatives, selecting pages for events, and so on. The inline browser uses a sandbox feature to provide a layer of security that prevents you from unintentionally browsing outside of SAS Customer Intelligence 360 and losing work.

By default, the sandbox is enabled and uses these restrictions:

- The sandbox blocks content such as APIs, links that target specific browser contexts (such as "_parent" or "_top"), and so on.
- The content that is enabled is equivalent to setting an iframe's sandbox attribute to `"allow-same-origin allow-scripts allow-forms allow-popups"`. For more information about how these values affect content, see HTML <iframe> sandbox Attribute (external).

Disable this feature when you need to browse or test web content that is blocked.

Note: The sandbox setting is common across all instances of the inline browser. Configure the setting based on the most common use cases. You can also toggle the feature for specific content when it is necessary.

Inject HTML Content

Introduction

You can replace HTML content based on customer behavior or other factors. Select **Web content injected by custom JavaScript**. Write custom JavaScript code so that the content is delivered to the page from your site rather than from SAS Customer Intelligence 360.

When a spot is made available and processed by the SAS tag, the client JavaScript is notified. The client receives a JSON object that enables the client to find the spot element on the page and associate the element with content. For more information, see "Adding the SAS Tag" on page 16.

JSON Object Fields

The JSON object contains these fields. Depending on the definition of the spot, creative, or task, some of the fields might be blank.

`spotid`
: the ID that is associated with the spot.

`taskid`
: the ID that is associated with the task.

`creativeid`
: the ID that is associated with the creative.

`customid`
: the ID in the element's class. For `.sas-replaceable.sas-replaceable-id-7`, the `customid` is `7`. Alternatively, you can use the `selector` field.

`productid`
: the ID that is associated with the product.

`productsku`
: the product SKU.

`controlgroup`
: the ID that is associated with a control group. A control group is a subset of the target audience that receives the control variant or is assigned to the control path in testing. For more information, see "Control Group" on page 105.

`variantid`
: the ID of the variant used in testing. For more information, see "Setting Up Variants" on page 950.

`selector`
: the CSS selector for the spot. Alternatively, you can use the element's class name and `customid`. For example: `var target = jQuery(".sas-replaceable.sas-replaceable-id-"+ detailsObject.customid);` .

`url`
: the URL where content is loaded for the spot.

`idreference`
: the ID that is specified when the spot is defined. For example: `<idreference>4002448101901</idreference>`. The `idreference` is specified in the HTML body.

`content`
: the HTML code that is loaded by the calling URL. The content is URL encoded.

Here is an example of fields in an event.detail JSON object:

```
{
   "spotid":"46591556-a508-42de-8aec-e9fdd1b97d83",
   "taskid":"55136e4c-06a2-4732-9bd6-42d054635296",
   "creativeid":"482a739e-2651-4d01-99f1-dbf28b9c7f3c",
   "customid":"121212",
   "productid":"DGRET454",
   "productsku":"S12T-Gec-RS",
   "controlgroup":"34",
   "variantid":"54645",
```

```
    "selector":"div.sas-replaceable.sas-replaceable-id-121212",
    "url":"https://obsidian-ads.aimatch.com/obsidian/hserver?domain=sample_domain.sas.com
    &customerid=b75dcad3-d793-3091-bb47-0fc15def00cf
    &spot_id=46591556-a508-42de-8aec-e9fdd1b97d83/viewid=38106044682/hint=x",
    "idreference":"4002448101901",
    "content":"%3Chtml%3E%3C!--%20Enter%20the%20HTML%20source%20code%20for%20…"
}
```


Sample JavaScript Code

The following code is an example of the JavaScript that you might use. The code follows these steps:

1 The JavaScript waits for the spot to become available. If no spot is available, then no action is taken.

2 When the spot is available, the spot details are extracted from the event.detail JSON. This example uses ReplaceSpot.to replace the spot with the relevant content. There are other methods that you can use.

3 The event.detail JSON is parsed and a JavaScript object is created.

4 The spot element is retrieved by its CSS selector.

5 If a value for the idreference variable is available, find the custom content. SAS Customer Intelligence 360 provides the idreference value. The user retrieves the content that is based on the value for idreference. If no idreference value is available, use the default content from SAS Customer Intelligence 360.

```
<script type="text/javascript">

/*
Wait for the spot to become available.
Extract spot details from event.detail JSON.
*/

jQuery(document).on("spotReady", function(event){
    console.log("spotReady was triggered", event);
    ReplaceSpot(event.detail);
});

/*
ReplaceSpot is one example of how to replace the spot with relevant content.

*/

function ReplaceSpot(details){
    console.log("Spot is being replaced",details);

    /*
    Parse JSON and create a JavaScript object.
    */
    var detailsObject = JSON.parse(details);

    /*
    Get spot element using its CSS selector.
    */
```

```
    var target = jQuery(detailsObject.selector);

    /*
    If the idreference variable is available, find the custom content.
    Otherwise, use the default content from SAS Customer Intelligence 360.
    SAS Customer Intelligence 360 provides the idreference.
    The user must retrieve the content that is based on the idreference.
    */

    if (detailsObject.idreference) {
        alert(
        'Spot id : ' +detailsObject.spotid+
        '\nTask id : ' +detailsObject.taskid+
        '\nCreative id : ' +detailsObject.creativeid+
        '\nCustom id : ' +detailsObject.customid+
        '\nProduct id : ' + detailsObject.productid+
        '\nProduct SKU : ' +detailsObject.productsku+
        '\nControl Groupd : ' +detailsObject.controlgroup+
        '\nVariant id : ' +detailsObject.variantid+
        '\nSelector : ' +detailsObject.selector+
        '\nURL : ' +detailsObject.url+
        '\nid reference : ' +detailsObject.idreference+
        '\nContent : ' +detailsObject.content);

        target.load("/reactjs/"+detailsObject.idreference+".html");

    } else {
        target.html(decodeURIComponent(detailsObject.content));
    }
}
</script>
```

Form Fields

To configure how data is collected from form fields on your website:

1 Click **General Settings** on the navigation bar and select **Data Management** ⇨ **Form Fields**.

2 In the **Form Fields to Collect** section, select the collection behavior from one of these options:

Collect all form data
: collects all form data by default, but you can create rules to exclude specific types of fields.

Collect only specified form data
: collects data only from fields that match rules that you define. This option is selected by default.

Rules are evaluated according to these behaviors:

- On the **Rule to Find Page** tab, the only page attributes that are available are URL protocol, URL domain, and URL path.(entire path).

- Each form rule is independent from other rules. You can make rules as specific as you need, but make sure that rules do not conflict.
- Form fields of the `password` type are automatically ignored.
- Within each rule, sub-rules are combined with implicit logical AND operations to test whether conditions are met. For example, assume that you create an ignore rule with these values on the **Fields to Ignore** tab:

Table 4.4 *Ignore Rule for Form Fields*

Name	Value
Form: id	**Equals** `MyForm`
Field: id	**Contains** `hideme`

This rule is evaluated as follows: if the form ID equals "MyForm" AND the field ID contains "hideme", then ignore this field and do not include it in the submit event.

- Within each sub-rule, you can create logical OR conditions by separating values with a comma. For example, assume that there is a collection rule with these values:

Table 4.5 *Collection Rule for Form Fields*

Name	Value
Form: id	**Equals** `MyForm`
Field:name	**Contains** `show,diplay`

This rule is evaluated as follows: if the form ID equals "MyForm" AND the field name contains "show" OR "display", then include this field in the submit event.

Note: Ensure that the **Field Interactions** option and the **Form Submits** option are enabled on the **Data Management** ⇨ **Events** page. Those settings override settings on the **Form Fields** page. For information about event settings, see “Events”.

3 (Optional) In the **Obscured Form Fields** section, create a rule to obscure values that are collected from form fields. This rule is useful for hiding values for items such as real names or passwords in your data collection.

Rules are based on the ID attribute or name attribute. Form fields must contain at least one of these attributes to be obscured.

Personally Identifiable Information

1 Click **General Settings** on the navigation bar and click **Data Management** ⇨ **Personally Identifiable Information.**

2 In the **Do Not Track (DNT) Settings** section, select whether to honor Do Not Track (DNT) information in a user's HTTP header.

You can also set a DNT cookie in your users' browsers to control DNT settings.

3 In the **IP Address** section, select the option for how to process a user’s IP address. You can choose a combination of options to determine a user’s location and how the IP address is stored in your system.

Options that obscure the IP address replace the last octet of the address with a “0”. This preserves a user’s privacy but still enables you to determine whether IP addresses are internal or external to your network.

Note: Removing the last octet of a user’s IP address might reduce the accuracy of geographic reporting.

5

Content Delivery

Update the settings that manage how content is delivered to users.

Activity Settings

To set the default behavior for each task that you add to an activity map:

1 Click **General Settings** on the navigation bar and select **Content Delivery** ⇨ **Activities**.

2 Select **Impression** if you want customers to continue through the activity map only when they have seen the impression for the current task.

3 Select **Conversion** if you want customers to continue through the activity map only when they have reached the conversion goal for the current task.

If you change the default behavior, tasks that have already been added to an activity map are not affected.

For more information about these settings, see “Continue from Impression or Conversion” on page 747.

Email Settings

Configure Unsubscribe Settings

Set Up an Additional Domain for Reply Processing

Before you can configure unsubscribe settings for a tenant, you must set up additional mail exchanger (MX) records within the Domain Name System (DNS) that hosts records for the inbound domain. The inbound domain is the domain for the reply address. This domain is often associated with the same domain that is used for sending email, or the from address. These domains are typically in the same hosted zone. The inbound domain might be a subdomain of the sending domain.

The inbound domain must have an MX record established in the DNS as follows:

Table 5.1 *MX Record for Inbound Domain*

Name	Type	Data	Priority
your.inbounddomain.com	MX	.mx.e.sparkpost.com	10

In addition to this MX record in your own DNS, SAS must make additional configurations for your tenant and its dedicated SparkPost account. Please contact your SAS account manager for further assistance.

Specify How to Receive Unsubscribe Requests

To receive unsubscribe requests from recipients through an email reply, you can configure unsubscribe settings for a tenant. You can also configure unsubscribe settings for a single task. In an email task, you can override the unsubscribe settings that you configured for a tenant.

Note: The capability to receive unsubscribe requests through email reply is supported only for send agents that use SparkPost.

To configure unsubscribe settings for a tenant, from the navigation bar, click **General Settings** and select **Content Delivery** ⇨ **Email Settings**.

To configure unsubscribe settings in an email task, select **Orchestration** ⇨ **Delivery**.

Select an option to configure unsubscribe settings:

- If you do not want to receive unsubscribe requests through an email reply, select **Disable unsubscribe requests through email reply**.
- If you want to receive unsubscribe requests through an email reply, select **Enable unsubscribe requests through email reply**.

If you select **Enable unsubscribe requests through email reply**, specify one or more keywords that the subject text of the email reply must contain to process the unsubscribe requests. For example, you could specify the keywords “Unsubscribe” and “Opt out”. If an email reply from your recipient contains any of the keywords that you specified, the system processes the unsubscribe request. The preferences-related data is updated in the data hub records, and the email address is automatically excluded from future email tasks. If the subject text of an email reply contains multiple keywords that you specified, the system processes the unsubscribe request regardless of the order or the font case of the keywords.

Note: Use of special characters is not supported in the subject line of unsubscribe requests through email reply.

If you add or update a keyword after you have published a task, you must save and republish the task, and then update the custom unsubscribe text in your email. Unsubscribe requests are processed only for email replies that contain the updated keywords in the subject text.

For example, you specified the keyword “Unsubscribe” and you published the email task. An opt-out request is processed for all of the email replies that contain the keyword “Unsubscribe”. You modify the task and replace the keyword “Unsubscribe” with “Opt out”. You save and republish the task with the same email content. An unsubscribe request is processed for only those email replies that contain the word “Opt out”, not “Unsubscribe”.

CAUTION! Specify a single keyword in languages that do not use space separators between multiple words. For languages that do not use space separators between multiple words (for example, Chinese), you must specify options for single keywords. To unsubscribe through email reply, recipients must be directed to insert a single keyword in the subject text. Unsubscribe requests will not be honored for email replies with subject text that contains multiple keywords without space separators.

Note: The keywords that you specify in an email task take precedence over the keywords that you specify for a tenant. That is, task-level keywords are used to process unsubscribe requests. If no keywords are specified at the task level, then the keywords that you specified for the tenant are used to process unsubscribe requests.

All unsubscribe requests are processed through the send agent. If the selected send agent, which is used by a task, is associated with a program identifier, the unsubscribe requests are processed only for that program. If the selected send agent is not associated with a program identifier, unsubscribe requests are processed for all of the programs.

Conditionally Suppress PII Data in Unsubscribe Requests

When a recipient sends an unsubscribe request, the recipient is redirected to a default or a custom web page. The web page URL displays the email address of the recipient that sent the unsubscribe request, which is passed as a query parameter and is stored in the web logs. Since the email address is considered as personally identifiable information (PII) of a recipient, you can conditionally suppress the email address by configuring the values for a tenant property. For more information and assistance with the configuration of the tenant property, contact your SAS technical consultant.

Manage Replies

Receive Replies

To receive replies, you must specify a **Reply-to address** or the **Reply-to domain** that you have configured on the **New Send Agent** page that displays the information about a selected send agent. For more information, see “Create an Email Send Agent” on page 47. You can also select the email address or domain to receive replies in the **Reply-to** field on the **Header** tab in an email task. For more information, see “Specify Information for Email Header Fields” on page 586.

Make sure that a reply-to domain is already configured to receive unsubscribe replies, and a static email address is specified for forwarding received replies. If you configured the setting **Enable unsubscribe requests through email reply** or you specified an address for forwarding received replies, the Reply-to address in the received email is encoded. Otherwise, the Reply-to address that you specified displays as is. For more information and assistance with the configuration of the Reply-to domain, contact your SAS technical consultant.

Manage Automated Replies

You can create a triggered email task to send an automated response to recipients who reply to emails that are delivered by a bulk email task. The system records a reply event when a recipient replies to the email. When a reply event occurs, the triggered email task sends the automated response content. You can customize the content to convey that the email address, which the recipient has replied to, is not intended to receive replies, and that no human being is reading the replies.

To create an email task to send an automated response, complete these actions:

1. Create a new email task. Select **Triggered** as the delivery type, and select **Design your own layout** to build a new layout.

   For more information, see “Creating an Email Task” on page 561.

2. On the **Content** tab, in the **Layout** pane, select **HTML** or **Plain Text** , and open an editor window. For more information, see “Manage Your Content” on page 562.

3. Add the text for the automated response. For more information, see “Adding Content to a Task” on page 562.

   > **TIP** It is recommended that you set an Impression Limit to one per day for a triggered email task that delivers automatic response text. This setting prevents delivery of infinite automated response emails and also prevents the impressions from being exhausted after a single reply. For more information, see “Set Impression Limits” on page 563.

4. On the **Orchestration** tab, click **Trigger** and select **Email Reply** as the trigger event. To add a trigger for a specific task, add an event attribute condition and select **Task** as the criteria. To specify a value, select a bulk email task. For more information, see “Adding a Trigger” on page 597.

5. Click **Delivery** and select a send agent.

6 Specify the relevant information on the **Header** tab and publish the task.

The email task delivers content when a reply event occurs and a recipient replies to the email that was delivered by the bulk email task.

Note: If a value for the program_ID property is specified for the send agent that is used by the triggered email task, email recipients who click the unsubscribe link are opted out of that program. If no value is specified, they are opted-out of all the programs and will not receive the automated response or any further emails. For more information, see “Unsubscribe Recipients from a Program” on page 49.

Scenarios When Unsubscribe Requests Are Not Processed

If you have enabled unsubscribe requests through email reply, in some cases the system might be unable to honor an unsubscribe request in an email reply. If recipient replies to an HTML or Plain Text email that is delivered by a bulk email task with the appropriate keywords, and if the following conditions are true, the recipient cannot be opted out:

- The recipient has replaced or deleted the original subject text.
- The recipient has modified the original Reply-to address.
- In case of HTML, the recipient has deleted or replaced the original content.

If the above conditions are true, an opt-out event is not recorded because the system cannot track the identity of the recipient. However, in the above scenario, the Email reply event is recorded and the automated email response text is sent.

Create an Email Send Agent

A send agent represents a connection to an outbound mail server for the delivery of emails. For example, a connection that is configured to the Amazon Simple Email Service (SES) might be defined as a send agent. As an administrative user, you can create a send agent or delete an existing send agent.

To create an email send agent:

1 From the navigation bar, click **General Settings** and select **Content Delivery** ⇨ **Email Settings**.

2 In the **Send Agents** section, click .

3 On the **New Send Agent** page, specify the information for the new send agent in these fields:

Name
Specify a unique name for the send agent.

Delivery service
Select the email delivery service provider that is available for your site.

Properties
Contains information about the delivery service. Next to each property, its value is specified in the **Value** column.

Note: To select a different encoding format for the email content, specify a value for the `message_encoding` property. The default value for this property is set to UTF-8 encoding.

4 (Optional) In the **Notifications** section, select the **Send email notifications for task execution** check box. Enter the email addresses of the users who need to receive a notification when the execution of a bulk email task is completed. The email contains metrics such as these:

- the total number of recipients that are targeted. This number excludes the recipients who opt out.
- the total number of email imprints that are created. This number includes the imprints that are delivered successfully as well as the imprints that fail to be delivered.
- the total number of recipients that are excluded. Recipients are excluded when email addresses are invalid, the impression limit is achieved, or data is not found. For certain identities, imprints are not generated due to insufficient data.

5 In the **From Addresses and Domains** section, select **From address** or **From domain** from the drop-down list. Click + to add one or more values that are available after the sender verification process is complete for that email address or domain. For more information about the sender verification process, contact your SAS Solutions on Demand (SSOD) representative.

Specify at least one value for the **From address** or **From domain**. In the **Display as** field, you can specify a display name for the **From address**.

6 In the **Reply-to Addresses and Domains** section, you can add one or more addresses or domains to receive replies to your emails. Select **Reply-to address** or **Reply-to domain** from the drop-down list. Click + to add an approved value in the user-entry box.

In the **Display as** field, you can specify a name for the **Reply-to address**. @ is not a supported character in the value for the **Display as** field.

7 Click **Done** to create the send agent.

Note: Provision for sending emails is activated during the tenant on-boarding process. For more information and assistance with the configuration of the email sending account, contact your SAS technical consultant.

When you create the first send agent, it is automatically defined as the default send agent. If you create multiple send agents, use the toggle buttons to define the default send agent. You can define only one default send agent at a time. The default send agent cannot be deleted.

Delete an Email Send Agent

In the **Send Agents** section, click **Select**. Select a check box to delete one or more send agents, and then click .

Unsubscribe Recipients from a Program

After you create a send agent, you can associate a send agent with a program for a specific line of business. When a task selects the send agent, the task is automatically associated with that program. To associate a send agent with a program, you must create a program ID, which is unique identifier that is assigned to the program.

In the **Send Agents** section, click a send agent to display the send agent information. In the **Properties** field, for the program_ID property, specify the unique identifier in the **Value** column.

Note:

The value for the program_ID property has a limit of 72 characters and only alphanumeric characters are supported. For languages with double-byte character set (DBCS) and multi-byte character set (MBCS), the limit is proportionately reduced, depending upon the length of each character. Characters that exceed the limit are truncated, and consequently the user is unsubscribed from the truncated program ID, which might have unexpected results.

An email recipient can choose to unsubscribe from all of the promotional emails or from a specific program. When an email recipient clicks the unsubscribe link for a program, the recipient is unsubscribed from receiving emails for that program, but continues to receive emails for other programs and promotional emails that do not specify a program ID. An opt-out event is recorded and the preferences-related data is updated in the data hub records. When emails are sent by a task that is associated with the program ID, the task automatically filters and excludes unsubscribed recipients for that program.

Note: If you do not specify a value for the program_ID property in the send agent that is used by a task, email recipients who click the unsubscribe link are opted out of all of the programs.

During execution of a task, the program_ID value that is provided for a selected send agent is considered. Later, if the program_ID value of the send agent is changed and the send agent is selected for the same task, then the changed program ID value is considered for the next execution cycle of the task.

Program data that is captured by an opt-out event can be sent to an external system. An email send agent must be associated with an on-premises agent in order for the email send agent to send generated opt-out events data to the on-premises agent for processing. For more information, see “Add a General Access Point” on page 54.

Mobile Applications

You can create and manage mobile applications (apps). Ensure that you have downloaded and activated the mobile SDK for your iOS or Android mobile device. For more information about working with your mobile device in SAS Customer Intelligence 360, see “About the Mobile SDK”. And for the most updated information about your device, see the Apple Developer website or the Google Developer website.

Create Mobile Applications

Before working with your application, you need to create and register your mobile application:

1. Click **General Settings** from the navigation bar and select **Content Delivery** ⇨ **Mobile Applications**.

2. Click .

3. Specify the application name and ID. The system uses the application ID to associate the application with the mobile events and spots that you create. The application ID must be unique.

4. Select whether you want the data collection status to be active or inactive. Selecting inactive stops the collection of data for the mobile app.

5. Enter the required credentials for Apple or Google notifications:

   - Click **Add** in the **Apple Production Certificate and Key** section. Enter the Apple Push Services production certificate and key, and then click **OK**.

     For more information, see "Apple Production and Development Certificates and Keys for Enabling Push Services" on page 386.

     For more information about setting up your iOS device, see the appropriate Apple Developer website.

   - Click **Add** in the **Apple Development Certificate and Key** section. Enter the Apple Push Services development certificate and key, and then click **OK**.

     For more information, see "Apple Production and Development Certificates and Keys for Enabling Push Services" on page 386.

     For more information about setting up your iOS device, see the Apple Developer website.

   - Click **Add** in the **Firebase Cloud Messaging Server Key** section. Enter the Firebase cloud messaging server key, and then click **OK**.

     For more information, see "Firebase Cloud Messaging Service Key" on page 391.

     For the most recent information about registering and setting up your mobile app on Android, see the Firebase Developers website.

6. Click **Done**.

Manage Mobile Applications

You can select and download the framework for an application.

1. Click **General Settings** from the navigation bar and select **Content Delivery** ⇨ **Mobile Applications**.

2 Click **Select** and select the appropriate application.

3 Click to download the application framework. A ZIP file appears at the bottom of the screen. Click the ZIP file to access the Android and iOS files.

To delete an application, select the application and click .

Exporting Data in a Direct Marketing Task

You can create and manage templates that are used for exporting data in a Direct Marketing task. For more information about Direct Marketing tasks, see “About Direct Marketing Tasks” on page 523.

Create a Template for Exporting Data

1 From the navigation bar, click **General Settings** and select **Content Delivery** ⇨ **Export**.

2 Click .

3 If you want to export data from an on-premises data source, select **Use on-premises datamart**. If you want to export data from the cloud, select **Use cloud datahub**.

4 Perform the following actions on the **Properties** tab:

- Enter information in the **Name** field.
- (Optional) Enter information in the **Description** field.
- Select **Comma separated values (.csv)**, **SAS data set**, or **Table** from the **Output type** list.

If you selected **Use on-premises datamart**, perform these additional actions on the **Properties** tab:

- In the **Export location** field, specify a default location for the new export table.
- To add a header row to the export template so that the exported data displays the output name for every export field, select **Include header row**.
- To exclude duplicate rows or subjects from the export file, select **Discard rows with duplicate subject IDs per input node**.

  Note: A subject might continue to appear multiple times if the same subject comes from separate input nodes.

5 Perform the following actions on the **Export Selection** tab:

- If you selected **Use on-premises datamart**, select a **Subject** to determine the output of the template.

- If you selected **Use on-premises datamart** or **Use cloud datahub**, click **Add Fields** and continue with the next step.

6 Select one or more fields in the Select Criteria window. To select all fields, click the top row.

Note: Data items can be at multiple subject levels in on-premises segments. If you select a data item in the Select Criteria window that is at both the Customer and Household subject level, the data item is still available if you change the subject for the on-premises segment from **Customer** to **Household**.

7 Click **OK**. The export field appears in the table.

8 To add another export field to the table:

a Click .

b In the Select Criteria window, select one or more fields in the Select Criteria window and click **OK**.

9 To change an existing export field, click in the Export Field column, select a field, and click **OK**.

10 Click or to move export fields up or down in the list.

11 To remove export fields, select the rows for the fields, and then click .

12 Select the rows for the export fields that you want to add. To select all fields, click the top row.

13 If you selected **Use on-premises datamart**, you can also specify a sort order for the export fields on the **Sorting Options** tab.

To specify the primary sort order, click **Add Sort Order**. To create another sort order, click . To delete a sort order, click .

14 Click **Done**.

Delete a Template

1 Click **Select** and select templates that you want to delete. To delete all templates, click the check box in the top row of the template table.

2 Click .

3 Click **Yes** in the confirmation window.

6

External

Create an access point that can be used to interact with SAS Customer Intelligence 360 data and specify the external applications that can send events to SAS Customer Intelligence 360.

External Access

Click **General Settings** on the navigation bar and select **Access** below the **External** heading to create access points and access point credentials that help manage the processing of data between SAS Customer Intelligence 360 and your site. You can download the ZIP file that contains the access point SDKs to a file directory in an on-site environment or in a private cloud environment.

View Access Point Status

To view the status of an existing access point, click . The **Access Point Status** window notifies you as to which components contain errors (for example, configuration is invalid), which components are currently disabled, and which components are reporting success (for example, status is healthy and responding as expected), as well as the number of components in the access point exhibiting each status. To export the status messages, click .

Add a General Access Point

To use the on-premises gateway functionality, you must define a general access point in SAS Customer Intelligence 360. If you need to set up SAS Real-Time Decision Manager or on-premises SAS Event Stream Processing to process SAS Customer Intelligence 360 events, you must download the general access point ZIP file, unzip it, and configure it. You do not need to download the ZIP file to send external events to SAS Customer Intelligence 360. You can also set up your own process to receive SAS Customer Intelligence 360 events without downloading the ZIP file.

To add a general access point:

1 Click .

   a Select **New General Access Point** from the drop-down list.

2 Click **Access Point Credentials**.

3 Enter unique information in the **Name** field.

   The **ID** is automatically generated by the system.

4 To add general access point credentials (that is, a key for the access point), click **Add**.

5 To activate the general access point, select **Active**. By default, the status of the general access point is **Inactive**.

   Note: You must add general access point credentials before you can change the status of the access point to Active.

6 In the **Request New Credentials** dialog box, click **OK** to accept the system-generated **Tenant ID** and **Client secret**.

7 If necessary, replace or remove the credentials. To replace the client secret, click **Replace**, and then click **OK** in the **Request New Credentials** dialog box. To remove the system-generated tenant ID and client secret, click **Remove**, and then click **Yes** in the confirmation dialog box.

8 To identify the events that you want SAS Customer Intelligence 360 to send to the general access point, click **Associations**, select **Select events**, and then complete these actions:

   a Click .

b Select the check box in the row for the event that you want to add. To add all items in the table, select the check box in the top row of the event table.

To search for an event, enter information in the search box in the **Select Event** window.

c Click **OK**.

9 To identify the data views that you want SAS Customer Intelligence 360 to send to the general access point, click **Associations**, select **Select data views**, and then complete these actions:

a Click .

b Select the check box in the row for the data view that you want to add. To add all items in the table, select the check box in the top row of the data view table.

To search for a data view, enter information in the search box in the **Select Data View** window.

c Click **OK**.

10 To specify the IDs that become mapped to the internal ID for outgoing and incoming events:

a Click **Associations**.

b Select **Associated IDs**.

c Select one or more items in the **Available items** panel, and then click . To select all available items, click . To undo your selection, click .

The values for these IDs are inserted into events sent from SAS Customer Intelligence 360 to the on-premises access point (outgoing events) and into events sent from the on-premises access point to SAS Customer Intelligence 360 (incoming events).

11 Email send agents must be associated with an on-premises access point in order for the email send agent to send generated opt-out events to the on-premises access point for processing. For more information, see “Email Settings” on page 44.

Note: If any of the email send agents are associated with an external access point, then that external access point also receives all hard-bounce events for that tenant.

To associate an email send agent with the access point, click **Email**, select **Select send agents**, and then complete these actions:

a Click .

b Select the check box in the row for the send agent that you want to add. To add all send agents in the table, select the check box in the top row of the send agent table.

c Click **OK**.

12 To associate a third-party content management system (CMS) with the general access point, click **Content Management**, and then complete these steps:

a Select the **Enable content management** check box. Only a single general access point for a tenant is allowed to have CMS integration enabled.

b Enter appropriate information into the **Name** field.

c Enter the name of the class defined in your JAR file into the **Class** field.

d (Optional) Select the **Allow search** check box if your CMS is enabled to allow searches.

e (Optional) Select the **Allow folders** check box if your CMS includes folders.

13 To map SAS Event Stream Processing windows either inbound to or outbound from SAS Customer Intelligence 360 external events, click **SAS Event Stream Processing**, and complete these actions:

a Select the **Enable events from or to SAS Event Stream Processing** check box.

b Enter the location of the SAS Event Stream Processing application in the **SAS Event Stream Processing URL** field.

c Click either the **Inbound Events** or **Outbound Events** tab.

d Click the **Add Event Maps** button.

e Enter the names of SAS Event Stream Processing windows that are being mapped into (inbound) or out from (outbound) SAS Customer Intelligence 360 external events in the **Event Stream Processing window** field.

f In the **Trigger event** field, click and select external events that are being mapped into (inbound) or out from (outbound) SAS Customer Intelligence 360.

Note: For inbound events, the **Event Stream Processing window** field appears first, followed by the **Trigger event** field to signify that the mapping goes in the direction of SAS Customer Intelligence 360. For outbound events, these fields appear in reverse to signify that the mapping is out from SAS Customer Intelligence 360.

g In the **Attributes** field, enter SAS Event Stream Processing window variables and SAS Customer Intelligence 360 event attributes in this format: `window variable name, event attribute` for inbound mappings and `event attribute, window variable name` for outbound mappings. You can enter multiple pairs of window variables and event attributes that are separated by a new line.

h To map additional SAS Event Stream Processing windows to SAS Customer Intelligence 360 events, click +.

i To remove an event map, click in the panel for the map.

14 To map SAS Customer Intelligence 360 events to SAS Real-Time Decision Manager events, click **SAS Real-Time Decision Manager**, and then complete these actions:

a Select the **Enable streaming events to SAS Real-Time Decision Manager** check box.

b Enter the location of the SAS Real-Time Decision Manager application in the **SAS Real-Time Decision Manager URL** field.

c Click and then select a SAS Customer Intelligence 360 trigger event. The occurrence of this event generates an offer from SAS Real-Time Decision Manager.

d In the **Real-Time Decision Manager event** field, enter the SAS Real-Time Decision Manager event that you want to map to a SAS Customer Intelligence 360 event.

e (Optional) Click and select an external event in SAS Customer Intelligence 360 to use as a response event.

f In the **Attributes** field, enter SAS Customer Intelligence 360 event attributes and SAS Real-Time Decision Manager event attributes in this format: `SAS Customer Intelligence 360 event attribute, SAS Real-Time Decision Manager event attribute`. You can enter multiple pairs of event attributes that are separated by a new line.

g To map additional SAS Customer Intelligence 360 events to SAS Real-Time Decision Manager events, click ✚.

h To remove an event map, click in the panel for the map.

15 To download the general access point SDK, click **Download Framework**, and then click **Download General Framework** to download the ZIP file to a directory on your local system. Provide the file and login credentials to users who need access to interact with SAS Customer Intelligence 360.

To configure the general access point, manually copy and paste the tenant ID and client secret to the /config/event-streaming-configuration.properties file located in the folder where the access point is installed and included in the downloaded SDK ZIP file. For more information about configuring the general access point, see “Contents of the General Access Point SDK” on page 61. Be sure to delete “#” in the lines that contain the tenant ID and client secret.

16 Click **Done**. The general access point appears in the table on the **Access** page.

Add a Direct Access Point

Note: SAS Customer Intelligence 360 can use only one direct access point. If there is an existing direct access point, you must delete it before you can create a direct access point.

A direct access point in SAS Customer Intelligence 360 is typically installed on customer premises and is intended to process requests from SAS Customer Intelligence 360 in the cloud. The direct access point uses a SAS Information Map and the customer data mart to process the requests.

To add a direct access point:

1 Click .

a Select **New Direct Access Point** from the drop-down list.

2 Click **Access Point Credentials**.

3 Enter unique information in the **Name** field.

The **ID** is automatically generated by the system.

4 To add direct access point credentials (that is, a key for the access point), click **Add**.

5 To activate the direct access point, select **Active**. By default, the status of the direct access point is **Inactive**.

Note: You must add direct access point credentials before you can change the status of the access point to Active.

6 In the **Request New Credentials** dialog box, click **OK** to accept the system-generated **Tenant ID** and **Client secret**.

7 If necessary, replace or remove the credentials. To replace the client secret, click **Replace**, and then click **OK** in the **Request New Credentials** dialog box. To remove the system-generated tenant ID and client secret, click **Remove**, and then click **Yes** in the confirmation dialog box.

8 To enable the direct access point to use an on-premises data source for segmentation, to create export files, or to use an on-premises SAS installation to run SAS code from SAS Customer Intelligence 360, click **On-premises SAS Configuration** and complete these steps:

   a (Optional) Enter your SAS user ID.

   b (Optional) Enter your SAS password.

   c When you use an on-premises data source for segmentation or for creating export files, you must specify a SAS Information Map. Enter the path to the SAS Information Map to be used by the direct access point for accessing the on-premises data source. The SAS Information Map must be located on the SAS Metadata Server and the path must be specified as follows: "/<*metadata root folder*>/<*sub-folder*>/<*case-sensitive SAS Information Map name*>." For example, you might enter /CI Assets/Information Maps/<*case-sensitive SAS Information Map name*>.

   d Download the satellite package to access on-premises data and click the **Download** button.

9 To download the direct access point SDK, click **Download Framework**, and then click **Download Direct Framework** to download the ZIP file to a directory on your local system. Provide the file and login credentials to users who need access to interact with SAS Customer Intelligence 360.

To configure the direct access point, manually copy and paste the tenant ID and client secret to the /config/event-streaming-configuration.properties file located in the folder where the access point is installed and included in the downloaded SDK ZIP file. For more information about configuring the direct access point, see "Contents of the Direct Access Point SDK" on page 64. Be sure to delete "#" in the lines that contain the tenant ID and client secret.

10 Click **Done**. The direct access point appears in the table on the **Access** page.

Edit a General Access Point

Note: Edits to associated IDs, associated SAS Real-Time Decision Manager and SAS Event Stream Processing events, and associated email send agents are updated dynamically. Edits to the client secret and the class name for the CMS require a restart of the general access point.

1. In the table on the **Access** page, select a general access point.

2. Click **Access Point Credentials** to modify the general access point name, status, and credentials.

   Note: You cannot edit the existing general access point ID.

3. If you want to discontinue sending events to the general access point, click **Associations** and select **None**.

   To change the events that are sent to the general access point, click , select the events that you want to send, and then click **OK**.

   To delete an event that is being sent to the general access point, click in the row for the event.

   To search for an event, enter information in the search box in the **Select Event** window.

4. If you want to discontinue sending data views to the general access point, click **Associations** and select **None**.

   To change the data views that are sent to the general access point, click , select the data views that you want to send, and then click **OK**.

   To delete a data view that is being sent to the general access point, click in the row for the data view.

   To search for a data view, enter information in the search box in the **Select Data View** window.

5. If you want to modify the associated IDs for a general access point, perform the following actions:

   a. Select **Associations**.

   b. Select **Associated IDs**.

   c. Select one or more items in the **Available items** panel, and then click . To select all available items, click . To undo your selection, click .

      To deselect items, select one or more items in the Selected items pane, and then click . To deselect all items, click . To undo your deselection, click .

6. If you want to discontinue the general access point's existing association with email send agents, click **Email** and select **None**.

   To change an existing association with send agents, click , select the email send agents that you want to associate with the general access point, and then click **OK**.

   To delete an email send agent that is associated with the general access point, click in the row for the email send agent.

7. If you want to associate a CMS with the general access point, click **Content Management**, and then complete these steps:

   a. Select the **Enable content management** check box. Only a single general access point for a tenant is allowed to have CMS integration enabled.

b Enter appropriate information into the **Name** field.

c Enter the name of the class defined in your JAR file into the **Class** field.

d (Optional) Select the **Allow search** check box if your CMS is enabled to allow searches.

e (Optional) Select the **Allow folders** check box if your CMS includes folders.

8 If you want to modify existing map events for SAS Event Stream Processing, click **SAS Event Stream Processing**, and then enter information in fields and make selections as desired.

9 If you want to modify existing map events for SAS Real-Time Decision Manager, click **SAS Real-Time Decision Manager**, and then enter information in fields and make selections as desired.

10 If you want to download the general access point SDK, click **Download Framework**, and then click **Download General Framework** to download the ZIP file to a directory on your local system. Provide the file and login credentials to users that need access to interact with SAS Customer Intelligence 360.

To configure the general access point, manually copy and paste the tenant ID and client secret to the /config/event-streaming-configuration.properties file located in the folder where the access point is installed and included in the downloaded SDK ZIP file. For more information about configuring the general access point, see “Contents of the General Access Point SDK” on page 61. Be sure to delete “#” in the lines that contain the tenant ID and client secret.

11 Click **Done**.

Edit a Direct Access Point

1 In the table on the **Access** page, select a direct access point.

2 Click **Access Point Credentials** to modify the direct access point name, status, and credentials.

Note: You cannot edit the existing direct access point ID.

3 If you want to enable the direct access point to use an on-premises data source for segmentation, to create export files, or to use an on-premises SAS installation to run SAS code from SAS Customer Intelligence 360, click **On-premises SAS Configuration** and complete these steps:

a Enter your SAS user ID.

b Enter your SAS password.

c When you use an on-premises data source for segmentation or for creating export files, you must specify a SAS Information Map. Enter the path to the SAS Information Map to be used by the direct access point for accessing the on-premises data source. The SAS Information Map must be located on the SAS Metadata Server and the path must be specified as follows: “/<*metadata root folder*>/<*sub-folder*>/<*case-sensitive SAS Information Map name*>.” For example, you might enter /CI Assets/Information Maps/<*case-sensitive SAS Information Map name*>.

d Download the satellite package to access on-premises data and click the **Download** button.

4 If you want to download the direct access point SDK, click **Download Framework**, and then click **Download Direct Framework** to download the ZIP file to a directory on your local system. Provide the file and login credentials to users who need access to interact with SAS Customer Intelligence 360.

To configure the direct access point, manually copy and paste the tenant ID and client secret to the /config/event-streaming-configuration.properties file located in the folder where the access point is installed and included in the downloaded SDK ZIP file. For more information about configuring the direct access point, see “Contents of the Direct Access Point SDK” on page 64. Be sure to delete “#” in the lines that contain the tenant ID and client secret.

5 Click **Done**.

Deactivate an Access Point

1 In the table on the **Access** page, select an access point with the status of Active.

2 Select **Inactive**.

3 Click **Done**.

Delete an Access Point

1 Click **Select**.

2 Click the check box in the row for the access point that you want to delete. To delete all access points in the table, click the check box in the top row of the access point table.

3 Click 🗑.

4 Click **Yes** in the confirmation dialog box.

Contents of the General Access Point SDK

The SDK contains a ZIP fileset for Windows or a .tar fileset for UNIX. The contents of the general access point file are as follows:

bin
: contains these files:

- mkt-agent-sdk. This file contains the access point start-up script for UNIX.
- mkt-agent-sdk.bat. This file contains the access point start-up script for Windows.

- mkt-agent-service.bat. This file creates a Windows service to run the agent.
- mkt-agent-upgrade. This file is used to upgrade the existing access point to the latest version of UNIX.
- mkt-agent-upgrade.bat. This file is used to upgrade the existing access point to the latest version of Windows.

config
: contains these files:

- agent-endpoints.properties. This file contains the endpoint URLs for SAS Customer Intelligence 360, SAS Real-Time Decision Manager, and SAS Event Stream Processing.
- agent-runtime.properties. For information about this file, see the downloaded installation guide.
- agent-shell.properties.

  Here is information about the default properties for the file:

  - agent.shell.enable=true. When set to true (the default), this property controls whether the access point starts up and enables the user to issue commands in the shell. When set to false, the access point starts up with no shell available for user-driven (headless) commands. Setting the property to false enables you to run the access point in background mode on a Linux operating system.
  - agent.shell.defer.logging=true. When set to true (the default), and when agent.shell.enable is set to true, no access point start-up logs are sent to the console during start-up. The logs are deferred to the log file (depending on the logging configuration) or are cached and sent to the console, if possible, at access point shutdown.
- banner.txt. For information about this file, see the downloaded installation guide.
- event-streaming-configuration.properties. This file configures the access point. Edit this file with the values for your site.
- logback-spring.xml. This file sets logging levels, log file name, and log location. By default, a log file named sas.mkt.apigw.sdk.log is created in the logs folder. You can edit the name and location of this file in the logback-spring.xml file. You can also edit the logging levels such as INFO, DEBUG, and TRACE.
- logback-upgrade.xml. This file contains the logging configuration for the program that performs the agent upgrade.

doc
: contains these files:

- cms-configuration.json. This file contains code that enables you to integrate SAS Customer Intelligence 360 with a CMS. Information about this file is included in the on-premises access point installation guide.
- customerIntelligence-to-eventStreamProcessing-event-mappings.json. This file maps SAS Customer Intelligence 360 events to on-premises SAS Event Stream Processing windows.
- customerIntelligence-to-rtdm-event-mappings.json. This file maps SAS Customer Intelligence 360 events to on-premises SAS Real-Time Decision Manager events.

- eventStreamProcessing-to-customerIntelligence-event-mappings.json. This file maps on-premises SAS Event Stream Processing windows to SAS Customer Intelligence 360 events.
- LocalCmsProcessor.java. This file contains an example of how you can write your own CMS integration code.
- On Premise Agent Installation Guide.docx
- SampleEventProcessor.java. This file contains an example for processing events when building a third-party plug-in.
- sampleExternalEvent.json. This file contains the configuration information for sending external events to SAS Customer Intelligence 360.
- SampleExternalEventProcessor.java. This file contains an example for injecting events when building a third-party plug-in.

lib
: contains the SAS Customer Intelligence 360 access point JAR file and all Spring and third-party JAR file dependencies.

libThirdParty
: contains the README.txt file.

sdk
: contains the following items that can be used to create a custom access point:

- sample/folder
  - logback.xml. This item defines the logging setting for the sample access point.
  - pom.xml. This item defines Maven dependencies of the sample access point.
  - SampleAgent.java. You can use the sample code in this file to create an access point that connects to the SAS Customer Intelligence 360 event stream, prints all events that arrive from SAS Customer Intelligence 360, sends an external event to SAS Customer Intelligence 360, and requests a Signed S3 URL be returned for uploaded events into SAS Customer Intelligence 360.
  - SampleCMSAgent.java. You can use the sample code in this file to create an access point that processes CMS messages from SAS Customer Intelligence 360. You can also connect to the SAS Customer Intelligence 360 event stream and forward messages to the CMS.
  - SampleCMSMessageProcessor.java. You can use the sample code in this file to create an access point to enable SAS Customer Intelligence 360 to process CMS messages.
  - SampleMultiAgent.java. You can use the sample code in this file to create multiple access points that connect to the SAS Customer Intelligence 360 event stream. You can print all events that arrive from SAS Customer Intelligence 360, send an external event to SAS Customer Intelligence 360, and request a Signed S3 URL be returned for uploaded events into SAS Customer Intelligence 360.
- mkt-agent-sdk-jar-<*release*>.jar. These Java classes can be used to interact with SAS Customer Intelligence 360.
- mkt-agent-sdk-jar-<*release*>.javadoc.jar. These Java docs are for mkt-agent-sdk-jar-<*release*>.jar.

- pom.xml. This item defines Maven dependencies of mkt-agent-sdk-jar-<*release*>.jar.
- README_SampleAgent.txt. This item describes how to use the SampleAgents and mkt-agent-sdk-jar-<*release*>.jar to create an access point that can interact with SAS Customer Intelligence 360.

stage
: contains assets for the on-premises SAS Real-Time Decision Manager environment to stage treatments into SAS Customer Intelligence 360. The stage folder contains the lib folder, which contains the JAR files required for staging plus these files:

- ci360staging.properties. For information about this file, see README_install.txt.
- CI360StagingAssets65.spk. For information about this file, see README_install.txt.
- CI360StagingAssetsPre65.spk. For information about this file, see README_install.txt.
- README_install.txt. This file contains instructions for setting up the staging feature.

systemd
: This folder contains information about running the agent as a service in a Linux environment with System D. For more information about this folder, see the downloaded installation guide.

- mkt-agent-sdk. This file contains the access point start-up script for UNIX.
- mkt-agent-sdk.service. This file contains information about running the agent as a service in a Linux environment with System D. For more information about this file, see the downloaded installation guide.

upstart
: This folder contains information about running the agent as a service in a Linux environment with upstart. For more information about this folder, see the downloaded installation guide.

- mkt-agent-sdk.conf. This file contains information about running the agent as a service in a Linux environment with upstart. For more information about this file, see the downloaded installation guide.

README_stage.txt
: This file points to README_install_txt, which contains instructions for setting up the staging feature.

Contents of the Direct Access Point SDK

The SDK contains a ZIP fileset for Windows or a .tar fileset for UNIX. The contents of the direct access point file are as follows:

doc
: contains these files:

- CI360DirectAgentSetup.docx.
- CI360DirectAgentSetup.txt.

lib
: contains the SAS Customer Intelligence 360 access point JAR file and all Spring and third-party JAR file dependencies.

log_config
: contains these files:

- installer-log4j.xml.
- SASCustIntelOnPremDirect-log4j.xml.

systemd
: contains these files:

- direct-agent-service.env.
- direct-agent-service.service.

upstart
: contains these files:

- direct-agent-service.conf.

WEB-INF
: contains the following items that can be used to create a custom access point:

- spring-config/ folder
  - aop-config.xml.
  - application-context.xml.
  - ci-querytransfersvc-config.xml.
  - ci-ws-client-config.xml.
  - data-config.xml.
  - infrastructure-config.xml.
  - services-config.xml.
  - webapp-config.xml.
- CIOnPremDirect.xml.
- local-jps.properties.
- web.xml.

cionprem.properties
: Note: You can set the nonProxyHosts parameter in cionprem.properties so that the agent will start on a non-proxy host.

direct-agent-service.bat

dm.bat

dm.sh

docker.config.properties

install_app.bat

install_app.sh

logging.properties

run.cmd

run.sh

shutdown.cmd

shutdown.sh

Start the Access Point

The access point processes events from SAS Customer Intelligence 360 and publishes the events to plug-ins for SAS Real-Time Decision Manager and SAS Event Stream Processing.

To start the access point, navigate to the **\bin** folder. Issue this command:

```
mkt-apigw-sdk
```

Note: The **\bin** folder contains separate start-up scripts for Windows and UNIX.

The access point connects to the SAS Customer Intelligence 360 stream and begins to process events.

Upgrade the Access Point

The access point contains upgrade scripts to help keep the on-premises access point up-to-date. The two new scripts in the **\bin** folder that can be used to upgrade the existing access point to the latest version of Windows or UNIX are mkt-agent-upgrade.bat and mkt-agent-upgrade, respectively. Running these scripts requires the existing access point to be stopped. An error is returned if an upgrade is attempted while the access point is running. The upgrade process consists of these phases:

- Download: The latest access point code is downloaded from the SAS Customer Intelligence 360 gateway to the access point system and is placed in a folder named **new**.
- Backup: Any files to be replaced by an upgrade are backed up in a ZIP file. This backup is in the access point's root folder and is named access point<*date*>.zip.
- Overlay: Existing files that must be updated are overwritten with the version from the **new** folder. The list of files to be overwritten can vary depending on the current version and the new version of the access point. This list typically includes all files in the lib, doc, sdk, and stage folders of the access point SDK. Other files are also included, as needed. This phase can also include merging the contents of a new version of the file with the existing contents.
- Cleanup: Any temporary files that are created during the upgrade process (including the **new** folder created during the download phase) are removed.

Connect an Access Point to a Server or to the External API Gateway through a Proxy

Many corporate networking environments require that applications connect to servers through a proxy. To specify the proxy that is used by the http protocol handler, set the following properties:

- http.proxyHost: the host name of the proxy server.
- http.proxyPort: the port number. The default value is 80.
- http.nonProxyHosts: a list of hosts that must be connected directly, bypassing the proxy. This is a list of patterns that are separated by '|'. The patterns can start or end with a '*' for wildcards. Any host matching one of these patterns is connected directly instead of through a proxy.

To specify the proxy that is used by the https (http over SSL) protocol handler, set the following properties:

- https.proxyHost: the host name of the proxy server.
- https.proxyPort: the port number. The default value is 443.
- http.nonProxyHosts: a list of hosts that must be connected directly, bypassing the proxy. This is a list of patterns that are separated by '|'. The patterns can start or end with a '*' for wildcards. Any host matching one of these patterns is connected directly instead of through a proxy.

It is recommended that you set these properties for the protocol handlers as command line options in the Windows or UNIX access point start-up script.

Here is an example of setting command line options in Windows to specify a proxy for both http and https protocol handlers and to specify a list of non-proxy hosts:

```
"%JAVA_EXE%" %DEFAULT_JVM_OPTS% %JAVA_OPTS% %MKT_EXTAPIGW_SDK_OPTS% -classpath "%CLASSPAT
com.sas.mkt.apigw.sdk.streaming.agent.Application %CMD_LINE_ARGS% -Dhttp.proxyHost=myprox
-Dhttp.proxyPort=80 -Dhttps.proxyHost=myhttpsproxy.com -Dhttps.proxyPort=443 -Dhttp.nonPr
rtdm_server -Dhttp.nonProxyPort=7980
```

Here is an example of setting command line options in UNIX to specify a proxy for both http and https protocol handlers and to specify a list of non-proxy hosts:

```
exec "$JAVACMD" -Dhttp.proxyHost=myproxy.com -Dhttp.proxyPort=80 -Dhttps.proxyHost=
myhttpsproxy.com -Dhttps.proxyPort=443 -Dhttp.nonProxyHosts=rtdm_server -Dhttp.nonProxyPo
"${JVM_OPTS[@]}" -classpath "$CLASSPATH" com.sas.mkt.apigw.sdk.streaming.agent.Applicatio
```

For more information about specifying properties for a proxy, see the Oracle Java documentation at https://docs.oracle.com/javase/8/docs/technotes/guides/net/proxies.html.

To create a proxy that enables the access point SDK to make WebSocket, REST, and other http connections to the external API gateway, set the same -D command line options that are described in the previous section when you use the access point SDK to start the application. To use the BASIC and DIGEST authentication supported by the access point SDK, you must also set the following -D options:

- http.proxyUser or https.proxyUser is the user login for the proxy server.
- http.proxyPassword or https.proxyPassword is the user password for the proxy server.
- http.proxyRealm or https.proxyRealm is the protected area in the proxy where the login and password are valid.

General Access Point Commands

`agent config`
: displays access point configuration information.

`agent health`
: displays the health of the access point.

`agent metrics`
: displays the metrics of the access point.

`agent stop`
: stops the access point and exits the shell.

`event send`
: sends an external event to SAS Customer Intelligence 360.

`exit`
: stops the access point and exits the shell.

`help`
: lists all command usage.

`quit`
: stops the access point and exits the shell.

`version`
: displays the shell version.

Direct Access Point Commands

There are tools available from the command line that enable you to interact with the SAS Customer Intelligence 360 direct agent. (For more information about the direct access point commands, see the CI360DirectAgentSetup.docx file in the ZIP file that you downloaded.) The dm.sh command (UNIX) and dm.bat command (Windows) provide access to these tools:

`help`
: displays the list of available commands.

`cim`
: clears the SAS Information Map cache.

`gmd`
: generates metadata for the SAS Information Map.

This command has the following suboptions:

- character <*method name*> queries the method for character tables.
- clearcache clears metadata cache after generation.
- dataitems <*value,value...*> generates metadata for data items separated by ','.
- datehistogram <*method name*> queries the method for date histogram tables.
- histogram <*method name*> queries the method for histogram tables.
- mameta <*library name*> is a MAMeta metadata library.
- maxconcurrent <*value*> is the maximum number of concurrent processes per metadata generation.
- <*method name*> queries the method for all tables.
- numeric <*method name*> queries the method for numeric tables.
- tables <*value,value...*> generates metadata for tables separated by ','.

- univariate <*method name*> queries the method for univariate data.
- upload <*value,value....*> creates uploads separated by ',' after successful generation.
- uploadallitems uploads data for all subjects.

`qs`
: queries subjects.

This command has the following suboption:

- all returns all subjects.

`qmd`
: queries data item metadata.

This command has the following suboptions:

- compatibleSubjectsOnly queries metadata for compatible subjects only (when subject is not specified).

  Note: By default, all subjects are used if the compatibleSubjectsOnly suboption is not included in the command line.
- id <*dataitem id*> queries data item IDs associated with the metadata (for example, 'root.Age'). This argument is required.
- count returns only a count.
- subject <*subject id*> queries a subject ID associated with the metadata (override) (for example, SUBJECT_ID_CUSTOMER).

`qdi`
: queries data item hierarchy.

This command has the following suboptions:

- compatibleSubjectsOnly queries data items for compatible subjects only (when subject is not specified).

  Note: By default, all subjects are used if the compatibleSubjectsOnly suboption is not included in the command line.
- hasMetadata queries data items with metadata.

`ss`
: sends subjects to SAS Customer Intelligence 360 .

`smd`
: sends data item metadata to SAS Customer Intelligence 360.

This command has the following suboptions:

- compatibleSubjectsOnly sends metadata for compatible subjects only (when subject is not specified).

  Note: By default, all subjects are used if the compatibleSubjectsOnly suboption is not included in the command line.
- id <*dataitem id*> sends data item IDs that are associated with the metadata (for example, 'root.Age'). This argument is required.

`sdi`
: sends data item hierarchy to SAS Customer Intelligence 360.

Note: You can enter up to 255 characters in the SAS Information Map **Description** field for a data item. If the description is longer than 255 characters, this command fails.

This command has the following suboptions:

- compatibleSubjectsOnly sends data items for compatible subjects only (when subject is not specified).

  Note: By default, all subjects are used if the compatibleSubjectsOnly suboption is not included in the command line.

- noSubjects does not send subjects.

`qstp`
: queries SAS Stored Processes.

  This command has the following suboptions:

  - all includes all individual field types.
  - list includes list field types.
  - ranges includes range field types.

`sstp`
: sends SAS Stored Processes to SAS Customer Intelligence 360.

  This command has the following suboptions:

  - all includes all individual field types.
  - list includes list field types.
  - ranges includes range field types.

How On-Premises Processes Interact with SAS Customer Intelligence 360

Here are the methods that can be used to enable on-premises processes to interact with SAS Customer Intelligence 360:

- running the downloaded access point. For more information, see “External Access” on page 53.
- using the SDK from the ZIP file to build your own access point. For more information, see “Setting Up Sample Access Points for Customization” on page 70.
- making REST calls directly to SAS Customer Intelligence 360. For more information, see “Setting Up the External API Gateway” on page 813.

Setting Up Sample Access Points for Customization

Set Up an Access Point

1. Download Java SDK 1.8 or higher from Oracle.
2. Download Maven 3.5.3 or higher from maven.apache.org.

3 Add the Maven bin directory to $PATH or %PATH%.

4 Set or the export JAVA_HOME environment variable to point at the Java install root directory.

5 Install the SAS Customer Intelligence 360 SDK JAR file into your local repository: `mvn install:install-file -Dfile=<path where the access point was downloaded>/sdk/mkt-agent-sdk-jar-1.<current release>.jar \ -DpomFile=<path where the access point was downloaded>/sdk/pom.xml`

6 Create a directory for building the sample access point.

7 Copy `<path where the access point was downloaded>/sdk/sample/pom.xml` to the <*sample access point*> folder

8 Copy `<path where the access point was downloaded>/sdk/sample/logback.xml` to the <*sample access point*> folder

9 Create the **`src/main/java/sample`** subfolder under the <*sample access point*> folder.

10 Copy `<path where the access point was downloaded>/sdk/sample/*.java` to the ***`<sample access point>`*****`/src/main/java/sample`** folder.

11 Change the directory to the <*sample access point*> directory that you created.

12 Build the sample access points mvn compile.

13 In SAS Customer Intelligence 360, select **General Settings** ⇨ **External** ⇨ **Access** and then copy the displayed URL for the external gateway for SAS Customer Intelligence 360 that is used in the following sections.

Note: Only the host name is used in the URL for the gateway (for example, extapigwservice-prod.ci360.sas.com).

14 Create an access point definition in SAS Customer Intelligence 360 that is used in the following sections. For more information, see “Add a General Access Point” on page 54.

Run the Sample Access Point to Retrieve and Display Events from SAS Customer Intelligence 360

Use the following code to run the sample access point from the <*sample access point*> directory:

```
mvn exec:java -Dci360.gatewayHost=<SAS Customer Intelligence 360
Gateway host> -Dci360.tenantID=<tenant ID> -Dci360.clientSecret=<client
secret> \ -

Dlogback.configurationFile=logback.xml
-Dexec.mainClass="sample.SampleAgent" -s "<maven install root
directory>\conf\settings.xml"
```

The access point generates all events that were configured to be sent to the access point in the previous section. The following commands are also available:

`send <external event JSON>`
: injects the external event into SAS Customer Intelligence 360

`bulk <application ID>`
: requests a signed URL into which a set of events to be injected into SAS Customer Intelligence 360 can be written

`ping`
: indicates whether the SAS Customer Intelligence 360 Gateway is available

`healthcheck`
: indicates whether the SAS Customer Intelligence 360 gateway is running

`connection`
: returns the status of the streaming connection with the gateway

`diagnostics`
: returns a detailed status of the SAS Customer Intelligence 360 Gateway

`exit`
: exits the sample access point

Run the Sample CMS Access Point to Integrate a Third-Party CMS into SAS Customer Intelligence 360

Use the following code to run the sample CMS access point from the <*sample access point*> directory

```
mvn exec:java -Dci360.gatewayHost=<Gateway host for SAS Customer
Intelligence 360> -Dci360.tenantID=<tenant ID>
-Dci360.clientSecret=<client secret> \
```

```
-Dci360.cmsURL=<URL of the 3rd party CMS> \ -
Dlogback.configurationFile=logback.xml
-Dexec.mainClass="sample.SampleCMSAgent" -s "<maven install root
directory>\conf\settings.xml"
```

. The access point forwards all CMS requests from SAS Customer Intelligence 360 to the CMS that is configured in the ci360.cmsURL property. In SAS Customer Intelligence 360, you can view the assets that are stored in the third-party CMS. For more information, see “About Creatives” on page 435.

The following command is available:

`exit`
: exits the sample access point

Run the Sample Multiple Access Point File to Retrieve Events from SAS Customer Intelligence 360 for Two Access Points

1 Create another access point definition to be associated with the access point that you created in in “Set Up an Access Point” on page 70. For information about creating an access point, see “Add a General Access Point” on page 54.

2 Use the following code to run the sample access point from the <*sample access point*> directory

```
mvn exec:java -Dci360.gatewayHost1=<Gateway host for SAS Customer
Intelligence 360> -Dci360.tenantID1=<first tenant ID>
-Dci360.clientSecret1=<first client secret> \
```

```
-Dci360.gatewayHost2=<second gateway host for SAS Customer
Intelligence 360> -Dci360.tenantID2=<second tenant ID>
-Dci360.clientSecret2=<second client secret> \

-Dlogback.configurationFile=logback.xml
-Dexec.mainClass="sample.SampleMultiAgent" -s "<maven install root
directory>\conf\settings.xml"
```

The access point receives and displays events for both access points. You can use the commands that are listed in “Run the Sample Access Point to Retrieve and Display Events from SAS Customer Intelligence 360” on page 71.

Connect to the SAS Customer Intelligence 360 Gateway through a Proxy Server

The SDK for the custom access point supports connecting to SAS Customer Intelligence 360 through a proxy HTTP server. To use a proxy server, you enter the following options in the `mvn` command lines in the previous sections:

Note: The connection to the proxy can be secure or non-secure and can be authenticated or unauthenticated.

- Options for the proxy server using the http protocol handler:
  - Dhttp.proxyHost: the host name of the proxy server
  - Dhttp.proxyPort: the port used by the proxy server
- Options for the proxy server using the http protocol handler when the connection is authenticated:
  - Dhttp.proxyUser: the user name on the proxy server
  - Dhttp.proxyPassword: the user password on the proxy server
  - Dhttp.proxyRealm: the authentication realm for the proxy server
- Options for the proxy server using the https protocol handler:
  - Dhttps.proxyHost: the host name of the proxy server.
  - Dhttps.proxyPort: the port of the proxy server.
- Options for the proxy server using the https protocol handler when the connection is authenticated:
  - Dhttps.proxyUser: the user name on the proxy server
  - Dhttps.proxyPassword: the user password on the proxy server
  - Dhttps.proxyRealm: the authentication realm for the proxy server

External API Users

You can use the displayed API users to facilitate the integration of SAS Customer Intelligence 360 with the external applications that access the APIs in SAS Customer Intelligence 360. The API user credentials cannot be used to sign in to SAS Customer Intelligence 360, and the API users do not appear in the list of users on the **User Roles** page. Users who need to sign in to SAS Customer Intelligence

360 must be added in SAS App Central. Click **General Settings** on the navigation bar and select **External** ⇨ **API Users**.

Add an API User

To create an API user and manage the API user credentials for use in external systems:

1 Click .

2 Enter a user ID for the API.

Note: The user ID that you enter in this field is prepended with an identifier that is unique to your tenant to distinguish it from other users in the system. This user ID is used to access public APIs. An API user ID cannot be used to sign in to SAS Customer Intelligence 360.

Note: Only letters (A–Z, a–z), digits (0–9), hyphens, and underscores are allowed in user IDs.

3 (Optional) Enter a description.

4 Click **Generate Secret** to generate a secret password used to access a public API.

Note: A secret is automatically generated for your API user ID. You can enter these credentials for the API user into an external system in order to access SAS Customer Intelligence 360 APIs. Write down the secret and keep it in a secure location so that you can refer to it later. The secret is not stored in SAS Customer Intelligence 360. If you forget the secret for this API user ID after it is generated, click **Replace** to generate a new one.

5 Select **Active** or **Inactive** in order to set the status for the API user.

Edit an API User

To edit an existing API user and manage the API user credentials for use in external systems:

1 Click on the row containing the user ID credentials that you want to edit.

2 (Optional) Edit the existing description or enter a new one.

3 If you forgot the secret for this API user ID, click **Replace** to generate a new one.

4 Select **Active** or **Inactive** in order to set the status for the API user.

External Applications

Click **General Settings** on the navigation bar and then select **External ⇨ Applications** to manage on-premises applications that can send external events to SAS Customer Intelligence 360.

Add an External Application

1 Click .

2 Enter unique information in the **Application name** and **Application ID** fields.

Note: The application ID must match the configuration for the on-premises access point for the external application.

3 Click **Done**. The application appears in the table on the **Applications** page.

Edit an External Application

1 In the table on the **Applications** page, select an application.

2 Modify the application name as desired.

Note: You cannot edit the application ID.

3 Click **Done**.

Delete an External Application

1 Click **Select**.

2 Click the check box in the row for the application that you want to delete. To delete all applications in the table, click the check box in the top row of the application table.

3 Click .

4 Click **Yes** in the confirmation dialog box.

7

User Roles

Administrators can assign user roles that have specific capabilities in SAS Customer Intelligence 360.

About User Roles

In SAS Customer Intelligence 360, a user role provides access rights to specific menu items and pages in the user interface. The availability of user roles is dependent on the product that you licensed. Any user who is a member of a role has all of that role’s access rights. User roles are managed on the **User Roles** page.

Whether you have access to the **User Roles** page depends on the role you are assigned to in SAS App Central. The **User Roles** page is available only to users who have been assigned the SAS administrator role in SAS App Central. The users that have been assigned the SAS user role in SAS App Central cannot access the **User Roles** page in SAS Customer Intelligence 360.

Note: Only people who are assigned the SAS user role in SAS App Central appear in the list of users on the **User Roles** page. People who are assigned the SAS administrator role in SAS App Central do not appear on the **User Roles** page, because a SAS administrator already has access to all parts of the user interface.

By default, users who are assigned to the SAS user role in SAS App Central are assigned to the Engage Viewer and Insights Viewer roles in SAS Customer Intelligence 360. And users who are assigned to the SAS administrator role in SAS App Central are assigned to the Super Admin role in SAS Customer Intelligence 360.

List of Roles

Add one or more roles to a user in order to manage access to various parts of SAS Customer Intelligence 360.

Types of Roles

The **User Roles** page is available only to people who are administrators in SAS App Central, and is where administrators can add predefined roles to SAS Customer Intelligence 360 users. Most of the predefined roles can be grouped into the following categories:

- Roles restricted to Read-Only access. Use these roles when you want a user to view an item, but do not want that user to create or edit the item. Look for roles with “Viewer” in the name.
- Roles that allow users to view, create, and edit an item and mark that item ready for publishing. Users with this role cannot publish, pause, or complete an item. Look for roles with “Designer” or “Creator” in the name.
- Roles restricted to the ability to configure settings. Users with this role cannot access or edit items, but can edit the settings for a set of items. Look for roles with “Admin” in the name.
- Roles that do not restrict access. Users with this role can view, edit, and create items. They can also publish items. Assign this role to experienced users who need to access various parts of the user interface and affect content that is live. Look for roles with “Super User” in the name.
- Roles that allow publishing. The Publisher role allows a user to publish, pause, or complete items. A person with only this role cannot view, create, or update items. Combine this role with other roles that grant the access to view or edit the appropriate areas of the site. For example, you might pair the Publisher role with a Designer role to ensure that users have access to the items that they need to publish.

Roles Available

By assigning multiple roles to a user, you customize the type of access each person has to the different parts of SAS Customer Intelligence 360. The roles available are dependent on licensing. For more information about licensing options, see “Access to Components in SAS Customer Intelligence 360” on page 3.

Note: Users who are SAS App Central administrators have access to the **User Roles** page in SAS Customer Intelligence 360, but are not listed on the page.

Read-only

Use these roles when you want to limit a user's access to viewing items. These roles are intended to give users the ability to view different parts of SAS Customer Intelligence 360, but not to update or publish any items. Use the descriptions of the permissions granted by each role to determine which roles to add to a user.

Table 7.1 Read-only Roles

User Role	Offering	Description
Asset Viewer	SAS 360 Plan	View assets.
Engage Viewer	SAS 360 Engage: Digital, SAS 360 Engage: Direct, SAS 360 Engage: Email	One of two default user roles. Add to users who need to view various parts of SAS Customer Intelligence 360. Users who have this role can view activities, assets, creatives, data views, tasks, events, messages, segments, and spots.
Engage Financials and Planning Viewer	SAS 360 Engage: Digital, SAS 360 Engage: Direct, SAS 360 Engage: Email	Comment on planning items and view financial information for those planning items. Users who have this role can create, edit, and delete comments.
Insights Viewer	SAS 360 Discover, SAS 360 Engage: Digital, SAS 360 Engage: Direct, SAS 360 Engage: Email, SAS 360 Plan	One of the default user roles. Add to users who need only to view the **Insights** page.
Planning Viewer	SAS 360 Plan	View planning items without the ability to view financial information. Users who have this role can also create, edit, and delete comments on plan items.
Plan Viewer	SAS 360 Plan	View planning items and the financial information for the item. Users who have this role can view plans, planning items, financials, plan workflows, plan approval cycles, workflows, workflow tasks, messages, creatives, and assets.
Plan Financials Viewer	SAS 360 Plan	View planning items and the financial information for the item. Users who have this role can also create, edit, and delete comments on plan items.

User Role	Offering	Description
Reports Viewer	SAS 360 Discover, SAS 360 Engage: Digital, SAS 360 Engage: Direct, SAS 360 Engage: Email, SAS 360 Plan	View a report and its comments. Users that have this role can also export, print, email, and personalize reports.
Workflow Contributor	SAS 360 Plan	Use workflow tasks. Users who have this role can view and complete workflow tasks, edit and delete comments, and view planning information related to the tasks.

Edit

Add these roles to users who need to edit items or content. These roles do not include permission to publish items. Use the descriptions of the permissions granted by each role to determine which roles to add to a user.

Table 7.2 *Roles with Edit capability*

User Role	Offering	Description
Activity Designer	SAS 360 Engage: Digital, SAS 360 Engage: Direct, SAS 360 Engage: Email	Create, edit, and schedule activities. Includes the ability to create tasks and view creatives, events, and messages.
Asset Designer	SAS 360 Engage: Digital, SAS 360 Engage: Email, SAS 360 Plan	Create and edit assets. Does not grant access to delete assets.
Asset Manager	SAS 360 Engage: Digital, SAS 360 Engage: Email, SAS 360 Plan	Manage assets. Users who have this role can create, edit, and permanently delete assets.
Creative Designer	SAS 360 Engage: Digital, SAS 360 Engage: Direct, SAS 360 Engage: Email, SAS 360 Plan	Create and edit assets, creatives, and messages.
Direct Marketing Designer	SAS 360 Engage: Digital , SAS 360 Engage: Direct	Create and manage direct marketing tasks. Users who have this role can create, edit, and schedule data views, direct marketing tasks, and creatives. Users can also view events, messages, segments, and spots.

User Role	Offering	Description
Email Designer	SAS 360 Engage: Email, SAS 360 Engage: Email Testing	Create email tasks. Users who have this role can create, edit, and schedule the data views and email tasks. Users can also view creatives, events, messages, segments, and spots.
Engage Financials Creator	SAS 360 Engage: Digital, SAS 360 Engage: Direct, SAS 360 Engage: Email	Edit financial information. Users who have this role can also view planning items and edit or delete comments.
Engage Planning Creator	SAS 360 Engage: Digital, SAS 360 Engage: Direct, SAS 360 Engage: Email	Add to users who work on marketing strategies. Users who have this role can create and edit planning items, as well as add and delete comments.
Event Designer	SAS 360 Discover, SAS 360 Engage: Digital, SAS 360 Engage: Direct, SAS 360 Engage: Email	Create and edit events.
Mobile Designer	SAS 360 Engage: Digital	Create mobile tasks. Users who have this role can create, edit, and schedule mobile tasks and data views. Users can also view creatives, events, messages, spots, and segments.
Plan API User	SAS 360 Plan	Add to users who work with the Plan API. Users who have this role can edit and delete planning items, including financial information and comments.
Plan Approvals Creator	SAS 360 Plan	Create and edit workflows and approval tasks. Users who have this role can also edit and delete comments.
Plan Planning Creator	SAS 360 Plan	Create and edit planning items. Users who have this role can also edit and delete comments.
Plan Financials Creator	SAS 360 Plan	Add or edit financial information to planning items. Users who have this role can also edit and delete comments and view planning items.

User Role	Offering	Description
Plan Approver	SAS 360 Plan	Add to users who need to approve approval tasks. Users who have this role can also edit and delete comments.
Segment Designer	SAS 360 Engage: Digital, SAS 360 Engage: Direct, SAS 360 Engage: Email	Create segments. Users who have this role can also view data views and events.
Spot Designer	SAS 360 Engage: Digital	Create and edit spots.
Web Designer	SAS 360 Engage: Digital	Create web tasks and set schedules for the tasks. Users who have this role can create and edit data views. They can also view creatives, events, messages, spots, and segments.
Workflow Manager	SAS 360 Plan	Create workflows. Users who have this role can also edit and delete comments and view planning items.

Configure

Add these roles to users who need to update settings and configure the site. These roles do not give a user access to the **User Roles** page, or access to view or create related items or content. The role descriptions list which configuration pages users are given access to. Use the descriptions the permissions granted by each role to determine which roles to add to a user.

Table 7.3 *Roles with Configure capability*

User Role	Offering	Description
Configuration Admin	SAS 360 Discover, SAS 360 Engage: Digital, SAS 360 Engage: Direct, SAS 360 Engage: Email, SAS 360 Plan	Add to users who need to update settings but do not need to manage roles. Users who have this role can access the **General Settings** and **Data Processing** pages from the **Configuration** section of the navigation bar. Note: This role does not give a user access to the **User Roles** page.

User Role	Offering	Description
Discover Admin	SAS 360 Discover	Set up rules for data collection and create events. Users who have this role can access the **Basic Collection Rules**, **Advanced Collection Rules**, and **Events** pages from the **Setup** section of the navigation bar.

Administer or Publish

Add these roles to users who can be trusted with unrestricted access or who need to be able to publish content.

Table 7.4 Roles for Super Users

User Role	Offering	Description
Engage Super User	SAS 360 Engage: Digital, SAS 360 Engage: Direct, SAS 360 Engage: Email	Add to users who require unrestricted access to all areas of the product. Users with this role can create, schedule, and publish items and content.
Plan Super User	SAS 360 Plan	Add to users who require unrestricted access to all areas of SAS 360 Plan. Users with this role can create, schedule, and publish planning and workflow items and content.
Publisher	SAS 360 Discover, SAS 360 Engage: Digital, SAS 360 Engage: Direct, SAS 360 Engage: Email	Add to users who need to publish, pause, or complete items. This role does not include the ability to view, create, or edit items. For example, a user with this role cannot edit or pause a web task unless that user also has the Web Designer role. For this reason, we recommend combining this role with other roles that grant access to the appropriate areas of the site.

Default User Roles

The following roles are added by default for new users. Users that are licensed for multiple offerings are given the default roles for all of the offerings.

Table 7.5 Default User Roles

Default User Roles	License
Insights Viewer and Reports Viewer	SAS 360 Discover
Reports Viewer, Insights Viewer, and Engage Viewer	SAS 360 Engage: Digital, SAS 360 Engage: Direct, SAS 360 Engage: Email, and SAS 360 Engage: Email Testing
Plan Viewer	SAS 360 Plan

Assign Roles to a User

An administrator can assign roles to a user in order for the user to have predefined access to certain areas of the user interface in SAS Customer Intelligence 360. For example, an administrator can assign the Event Designer role to a user so that the user can view and edit events on the **Events** page.

1 Click **General Settings** on the navigation bar and then select **Users** ⇨ **User Roles**.

2 To assign a role to individual users, select a row for the user and then click . The **Edit Roles** window appears.

   To assign roles to multiple users, select the rows for two or more users and then click +. The **Add Roles** window appears.

   Note: Users who were assigned the SAS Administrator role in App Central do not appear in the list of users. SAS Administrators automatically have complete access to all of the functionality that the tenant is licensed for.

   To search for a user, enter information in the search box.

   To filter users by **Role**, click .

3 Select rows for the roles that you want to assign. To select all rows, select the check box in the top row.

   Note: If the roles that are selected have already been assigned to selected users, the roles are retained for those users.

4 Click **OK**. Assigned roles take effect after the user signs out of SAS Customer Intelligence 360 and then signs back in.

   Note: It might take up to 15 minutes for role assignments to take effect.

Modify Roles for a User

An administrator might want to change the access rights that are available to a user. For example, a user who has been assigned only the Event Designer role might also need to be able to modify settings in SAS Customer Intelligence 360. To give the user access rights to the **Settings** page, the administrator must also assign the Admin Settings role to the user. An administrator might also need to remove role assignments from a user when a user's job responsibilities have changed. For example, an administrator might need to remove the Asset Manager role from a user because the user no longer needs to edit, view, or delete assets.

1 Click **General Settings** on the navigation bar and then select **Users** ⇨ **User Roles**.

2 Select the row for a user and then click . The **Edit Roles** window appears.

3 Select rows for the roles that you want to assign or deselect rows for the roles that you want to remove.

4 Click **OK**. Role assignments take effect after the user signs out of SAS Customer Intelligence 360 and then signs back in.

   Note: It might take up to 15 minutes for role assignment changes to take effect.

Remove Roles from Multiple Users

An administrator might need to remove role assignments for multiple users. For example, role assignments might need to be removed if the job responsibilities have changed for employees who have moved to a new department in a company. The administrator might need to remove the Engage Super User role from all these employees because they no longer need the access rights for that role in their new department.

1 Click **General Settings** on the navigation bar and select **General Settings** ⇨ **User Roles**.

2 Select the rows for two or more users and then click . The **Remove Roles** window appears.

3 Select the row for the roles that you want to remove from the selected users. To select all rows, select the check box in the top row.

   Note: Roles that have already been removed for selected users stay removed.

4 Click **OK**. Roles are removed after the user signs out of SAS Customer Intelligence 360 and then signs back in.

   Note: It might take up to 15 minutes for role removals to take effect.

8

Classification

Update the settings that control how incoming data is categorized.

User Identities

About the Identity Service

SAS Customer Intelligence 360 has the ability to collect data for both anonymous users and users with identifiable characteristics. These users can be identified through forms or by page view events. When users enter information that is recognized, you can map their interactions to their user profiles. For more information, see Chapter 19, “Managing Customer Identities,” on page 167.

You can also upload existing customer identities through the REST API. For more information, see Chapter 20, “Importing Data,” on page 185.

Create a Rule to Identify Users

1 From the navigation bar, click **General Settings** and select **Classification** ⇨ **User Identities**.

2 Click

3 Select the event type.

- Select **Click** if you want to monitor a page element when it is clicked. The page element that a user clicks is known as the click target.
- Select **Form Submit** if you want to specify form elements on a page to monitor.

- Select **Page View** when you want to specify a specific page or pages that match a pattern that you define.

Note: The **Advanced Event** option is no longer available. Existing advanced events still generate data for SAS 360 Discover, but they cannot be used in other licenses of SAS Customer Intelligence 360.

4 Select the page on your site to watch for this event.

CAUTION! Define only one identity event for a page on a site. When more than one identity event exists for the same page on a site, there is no way to ensure which event is triggered. Also, be sure your site's pages follow the guidelines for preparing your site on page 15.

- For a click event, navigate to the page that contains the click target. From the navigation bar, change the radio button to **Select** (from **Navigate**).

  Select the click target to highlight it. You can change this element later on the **Target Location** tab.

- For a form submit event, navigate to the page that contains the form. From the navigation bar, change the radio button to **Select** (from **Navigate**).

  Select the form element to highlight it. You can change this page or form element later on the **Form Location** tab.

- For page view events, select the page that you want to monitor.

  Note: You can change this page or page view event later on the **Page Location** tab.

5 Click **Create Definition**.

6 Select the identification type. The identification type is the category that best fits the user ID that you are capturing. All identity types are bridged together in the system to create unique customer profiles.

Select one of these types:

Login
: a login ID that represents a customer. For example, this value could be the user name that the customer uses for your site. Customer profiles can be associated with more than one login ID.

  Note: For SAS 360 Discover, you must define the user identity as a login type to ensure it is written to the SESSION_FACT.LAST_USER_ID table and automatically used as the primary key for the ECV process.

Customer ID
: a unique ID for a customer on your site. For example, this value could be the customer's account number. Typically, a customer has only one customer ID, but customers can be associated with multiple customer identities.

7 Refine which pages to include in the event on the **Event Configuration** tab.

a For form submit events, refine the elements that are used to identify the form in the **Form Identification** section.

b In the **Pages Containing Form** or **Pages in Event** section (depending on your event type), specify the pages to monitor for this event.

- To use only the page that you selected originally, select **Only page where selector was chosen** or **Selected page** (depending on your event type).

- Select **Pages matching attribute pattern** to define rules that determine which pages to include.
- Select **Any page** to include all pages.

8 Complete the fields on the **User ID Attribute** tab.

a Define how to capture the identification data.

- For form submit events, click  for the **Field Name, ID** field and select the form field to use.

  For the **Return** field, select the appropriate value from the menu. You might need to complete additional information based on the option that you choose.
- For click events and page view events, select an element that contains the information that you need.

  For the **Return value from** field, select a value based on the type of element:

  - For attributes, select the name of the attribute.
  - For field values, select **value**.
  - For the content of a node, select **innerHTML** or **innerText**, depending on the node type.
  - If you use a JavaScript object, you must specify *object.property* in the **Variable name** field. You cannot specify only the object.

b For the **Obscured** option, select **Yes** or **No**. This option specifies whether values are obscured before they are saved.

CAUTION! For best results, do not modify this setting after identities are created. If you change the obfuscation value after identities are created, the existing identities can be adversely impacted in the back-end database.

9 (Optional) Define an event to confirm a user's ID.

a Set the time period in which the user ID must be confirmed. The time can be in seconds or minutes. The default is one minute.

b Specify the page attributes that identify the confirmation event.

For example, assume that the body tag contains the text "isLoggedIn" for logged-in users. In the **Page Attributes** section, enter this text in the **Page element** field: `body:contains(isLoggedIn)`

Traffic Sources

In SAS Customer Intelligence 360, you assign customers to traffic sources based on their origination data. Depending on the origination and your configuration, this data can be populated automatically, determined through a set of rules that you define, or processed with built-in rules.

Overview

About Originations

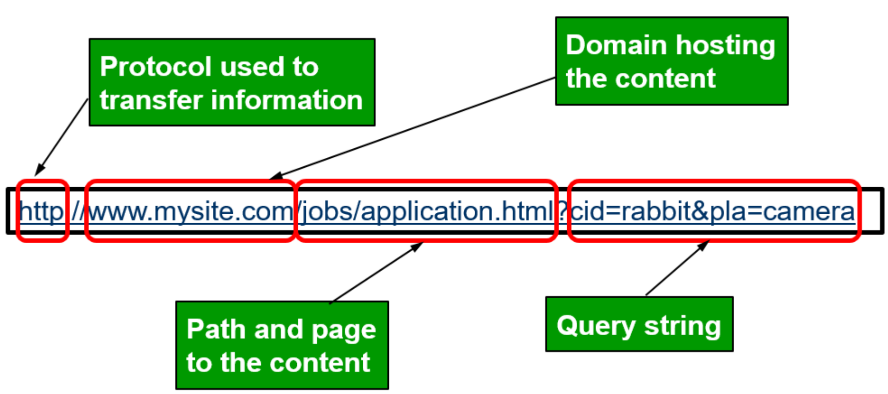
An *origination* is the original link, ad, search result, and so on, that leads a customer to your site. Originations contain referral information that helps you determine how visitors arrived at your website. This knowledge enables you to analyze the effectiveness of marketing and email campaigns, search engine optimizations (SEOs), and other channels that you use to communicate with visitors.

The source of a visit might be from one of the following origins:

- a personal referral or brand aware link
- an email
- a banner ad
- a sponsored search
- a natural (organic) search

An origination link should be constructed so that it contains referral information that you can use in your traffic source definitions. For example, a link might have the parts shown in this image:

Figure 8.1 *Traffic Source Link*



The *query string* is the series of characters that follow the question mark (?) in the URL of the landing page. The query string has these features::

- the string consists of [identifier]=[value] or name/value parameter pairs, which are typically separated by an ampersand (&) character
- the string can provide instructions that define what to display to your content management system

You can add additional data to the query string, which can assist with identifying a campaign or promotion, without affecting the content management system.

TIP If you include a CID query attribute in your link, then SAS Customer Intelligence 360 can use the link to populate some of the traffic source's attributes (such as placement, type, and creative). Alternatively, if a visitor uses a generic link, then SAS Customer Intelligence 360 can process the link based on custom or built-in rules.

Origination Configuration

SAS Customer Intelligence 360 processes data from origination links to identify customers' traffic sources by parsing the query parameters of the landing page, referral information in the URL, cookie information, search terms, and so on.

These standard attributes can be used to capture specific sources and assign each visit to the appropriate origination:

Origination Type
: the category for the traffic source (how the customer found your site). Some examples are banner ads, organic search, pay-per-click, referrals, partner sites, affiliates, email, or newspaper articles.

Origination Name
: the name of the campaign to which a link belongs.

Origination Placement
: a reference to where on the external page or site the banner or link was located.

Origination Creative
: specifies the visual element or message that is associated with the link, email, and so on.

Origination Tracking Code
: the campaign tracking code that is used to link to additional campaign information (such as cost, media agency used, and so on) in an external table.

Each of these attributes can be automatically generated (partially or completely) from data from a referring site, link information for one of your landing pages, or cookie content. For some definitions you might not want or need to populate every attribute.

How you use each attribute can also be customized based on the type of traffic source. For example, a creative attribute does not need to describe an image. In an ad-word campaign, the creative could be the search phrase that was used.

TIP To make the best use of origination data:

- Avoid link redirection, or request that affiliates encode unique IDs if they do redirect links. Link redirection might strip out important URL data that you want to track.
- Direct visitors to a URL that is specific to each marketing campaign, rather than sending them to a general home page.
- Start planning your origination approach early to ensure the quality of data. Create a template for origination links that you can take advantage of later.

  For example, you could always use the same attribute names, query strings, and identifiers for every origination link. Then, configuring traffic source rules in SAS Customer Intelligence 360 can be much simpler and most of the data can be generated for you automatically.

Using Attributes from Google Analytics

The five origination attributes for SAS Customer Intelligence 360 are similar to campaign attributes that Google Analytics defines with UTM parameters. Because many organizations use the Google UTM campaign parameters when they set up standard parameters, you could take advantage of that setup when deciding on your setup for SAS Customer Intelligence 360.

This table shows the origination attributes for Google Analytics:

Table 8.1 *Attribute Identifiers for Originations*

Attribute	Identifier
Name	`CID=/utm_campaign=` This attribute is required in the landing page URL query string. SAS Customer Intelligence 360 does not provide a default value.
Type	`TYPE=/utm_medium=` This attribute is given a default value if none is specified.
Placement	`PLA=/utm_source=` This attribute is not given a default value if none is specified.
Creative	`CRE=/utm_content=` This attribute is not given a default value if none is specified.
Tracking Code	`utm_term=` SAS Customer Intelligence 360 cannot process this value automatically. The value must be configured in the traffic source definition.

Note: UTM parameters are case sensitive. For example, `utm_source` is a different parameter than `UTM_source`.

Alternatively, you can use these identifiers:

- CID=
- TYPE=
- PLA=
- CRE=

It is possible to use other definitions (instead of CID or PLA), but you should review configuration definitions and agree to them with all stakeholders.

You can also enable auto-tagging in Google AdWords. In that case, Google AdWords automatically adds a gclid= parameter to your URL. Then, you can use that parameter in your traffic source definition.

Defining Rules for a Traffic Source

To define a rule to assign traffic sources:

1 From the navigation bar, click **General Settings**.

2 Click **Classification** ⇨ **Traffic Sources**.

3 Click to create a new rule.

4 On the **Source Properties** tab, define rules to identify the landing page for this traffic source. You can match patterns based on parts of the URL, a referral URL, values in a stored cookie, page attributes, and so on.

5 Perform these steps on the **Source Information** tab:

   a Define rules for how to construct the name for this source. Enter a custom value, or click + to construct the name based on attributes or elements from the page.

   For example, you can use these attribute rules to construct the traffic source name based on part of the referring URL's domain:

   Table 8.2 Definition for Traffic Source Name

Name	Value
Attribute name	`Referrer site`
Source attribute	Referrer URL domain
Return	After
After	`http://www.`

   b Select a type that fits this traffic source. Types of traffic sources might be displayed in other parts of SAS Customer Intelligence 360 if traffic source information is used (such as the **Attribution** tab for a data view).

   You can select one of these types:

   - **Affiliate**: an origination that contains information for an affiliate program.
   - **Email**: an origination from an email.
   - **Organic Search**: an origination that is the result of a customer entering one or more terms into a search engine and then clicking a search result that is not a paid ad. Organic searches are generated by a search engine’s algorithm, and the results are based on relevance instead of sponsored placement.
   - **Poster**: an origination that is associated with a poster ad campaign.
   - **Print**: an origination that is associated with a print ad campaign. For example, this link could be tied to a QR code in a magazine.

- **Referrer**: an origination associated with a referral link from a third-party website.
- **Search**: an origination that is associated with a search type. You can use this type to cover both sponsored searches and organic searches, or you could use this type to cover an origination that might not fit those other types.
- **Sponsored Search**: an origination that is the result of a customer entering one or more terms into a search engine and then clicking one of the paid ads.
- **TV**: an origination that is associated with a television ad campaign.
- **Other**: an origination that does not fit another, predefined type.
- **Custom value**: an origination that is a custom type that you define.

If an origination does not match one of the traffic source types, it is processed based on built-in rules. In this case, all of the origination information (such as creative or placement) might not be assigned to the traffic source record.

TIP You can define a rule as one of the general types (such as Other) to act as a default in case you want to prevent a session or visit from being evaluated with the built-in rules.

Here are the built-in rules:

Bookmark

classifies visitors who land deep in your site and there is no referrer information. Landing page URLs are generally long and not likely entered by hand, so visitors most likely used a bookmark to visit this page. Sessions and visits are assigned to this type if these conditions are true:

- The visitor’s first page is not a home page.
- There is no referral information.

These values are assigned for this type:

Table 8.3 Values for Bookmark Traffic Sources

Name	Value
Origination type	Organic
Origination name	Bookmark
Origination placement	
Origination creative	
Origination tracking code	

Brand Aware

identifies visitors who arrive directly to the website. A session or visit is assigned to the brand-aware origination if these conditions are true:

- The first page matches a landing page that is defined in SAS Customer Intelligence 360.

- There is no referral information, which means that the visitor entered the URL or used a bookmark.

Note: A search might start from a search engine (such as Google), but it is evaluated as a Brand Aware source when the visitor uses a set of predefined search terms (such as the website address, a brand name, or a brand product).

These values are assigned for this type:

Table 8.4 Values for Brand Aware Traffic Sources

Name	Value
Origination type	Organic
Origination name	Brand Aware
Origination placement	
Origination creative	
Origination tracking code	

Organic Search
: a traffic source or a search result that is a product of a search engine's algorithm. A session or visit is assigned to this definition if these conditions are true:

- The referrer matches a search engine that is recognized by SAS Customer Intelligence 360.
- The referrer contains the query string for a known search engine.

These values are assigned for this type:

Table 8.5 Values for Organic Search Traffic Sources

Name	Value
Origination type	Organic Search
Origination name	The name of the search engine (such as Google, Yahoo, or Bing)
Origination placement	The referrer's domain (such as google.com, yahoo.com, or bing.com) but without the specific server
Origination creative	
Origination tracking code	

Social Media
: traffic from social network sites. A session or visit is assigned to the name of the social network if it does not match a defined type and the referrer matches a social network site.

These values are assigned for this type:

Table 8.6 Values for Social Media Traffic Sources

Name	Value
Origination type	Social Media
Origination name	The name of the social media site (such as Facebook or Twitter).
Origination placement	The complete referral information
Origination creative	
Origination tracking code	

Unlisted Campaign
classifies visitors who land deep in your site and there is referral information. The visitor has most likely clicked a link that was provided at a third-party site that did not contain any campaign parameters. Sessions and visits are assigned to this type if these conditions are true:

- The visitor’s first page is not a home page.
- The referrer is not null.

These values are assigned for this type:

Table 8.7 Values for Unlisted Campaign Sources

Name	Value
Origination type	Unlisted Campaign
Origination name	The referrer’s domain
Origination placement	The complete referral information
Origination creative	
Origination tracking code	

Unlisted Affiliate
classifies visitors who land on one of your publicly advertised home pages, and there is information about the referring site. Sessions and visits are assigned to this type if the following conditions are true:

- The visitor’s first page is a home page.
- The referrer is not null.

These values are assigned for this type:

Table 8.8 *Values for Unlisted Affiliate Traffic Sources*

Name	Value
Origination type	Affiliate
Origination name	Unlisted Affiliate
Origination placement	The domain of the referrer
Origination creative	The complete referral information
Origination tracking code	

6 (Optional) On the **Source Attributes** tab, configure the following items:

- In the **Traffic Source Placement** section, define a placement rule. This rule defines the location of the element or link that led a visitor to your site. This location can be a specific page, site, or even location within a web page.

  For example, you can define the placement by extracting the title for a landing page:

Table 8.9 *Definition for Traffic Source Placement*

Name	Value
Attribute name	Product landing page
Source attribute	Page element
Selector	`div#product-805 > div.summary.entry-summary > h1.product_title.entry-title`
Return value from	Inner text
Return	Everything

- In the **Traffic Source Tracking Code** section, define a rule to determine the tracking code. This tracking code could be something that you use to identify specific demographics, targeted campaigns, and so on.
- In the **Traffic Source Creative** section, define a rule to associate this traffic source with a creative.

9

Tags and Codes

Create and manage search tags and codes.

Search Tags

To manage tags in the global tag universe, click **General Settings** from the navigation bar and select **Tag Cloud** ⇨ **Search Tags**. From this page, you can add, edit, and delete tags in the global tag universe.

About Tags

Tags are simple strings that you can associate with item instances in SAS Customer Intelligence 360. You can create tags independent of any item, or you can create and add a tag directly from an item itself. You can also edit or delete tags from an item's details or from the global tag list.

Here are some of the benefits of using tags:

- Explicit association. Tagging an item enables you to associate it with a known value, so you can group items that might not be naturally related.

  For example, you might want a group of assets that are associated with cloth. This category could contain items such as jeans, car seats, and towels. Without tags, you would need to create a custom attribute or include specific words in the description so that the search could find the items. However, if you add a "cloth" tag, retrieving this group is simple.

- Precise search result. Some items might have names or descriptions that are useful for their purpose but are not precise enough for some searches. Tags enable you to select distinct words that you know are associated with items.

- Multiple associations. Items can have as many tags as you need, so you could have one item that is a member of multiple tag groups.

- Global content management. You can review global tag lists to see all the items in your environment that use specific tags. This benefit enables you to quickly retrieve and operate on items that are in separate areas.

Global Tag Management

Create a New Tag

1 Click .

2 Enter a name in the **New Tag** dialog box.

3 Click **Save**.

Edit a Tag

1 Click the check box to select the tag that you want to edit. You can rename only one tag at a time.

2 Click **Rename**, and enter a new name in the **Rename** window.

3 Click **Save**.

Reconcile Tags

You can reconcile tags by consolidating several tags to a single tag and removing the unwanted tags.

1 Click the check boxes to select two or more tags that you want to reconcile and click .

The **Reconcile Tags** window displays the list of tags that you selected.

2 (Optional) Click + and select additional tags to reconcile.

3 Select a tag that you do not want to reconcile and click to remove the tag.

4 To reconcile the selected tags to a new tag, in the **Tag name** field, enter a new tag.

To reconcile the selected tags to an existing tag, click **Browse** and select the existing tag. Click **OK**.

5 Click **Save**. The tags that you selected are replaced by the reconciled tag.

Delete a Tag

1 Click **Select**, and select one or more tags to delete.

2 Click .

3 Click **Yes** to confirm that you want to delete the selected tags.

Manage Tags on an Item

When you are viewing the **Summary** tab of an item, you can add a search tag or manage any tags that are associated with it.

Add a Tag

1 Start typing in the **Tags** text field.

- If the tag already exists, it appears with similar tags in a drop-down list. Select the tag that you need from the list.
- If the tag does not exist, finish entering the tag and click **Add to List**. If the tag is new to the global tag universe, an asterisk (*) appears next to it.

2 Save the item.

Remove a Tag

1 Click the (**x**) that appears next to the tag's name.

2 Save the item.

Specifying Code Settings

Specify Code Settings for SAS 360 Engage Items

To specify the code format and generation setting for SAS 360 Engage items in SAS Customer Intelligence 360, click **General Settings** from the navigation bar and select **Tags and Codes** ⇨ **Engage Code Format**. From this page, you can specify the code settings for activities, tasks, messages, creatives, segment maps, and segments.

To specify the code setting for an item, select one of the following options in the **Code generation** field.

Note: Code settings do not affect existing items. Only new items are affected by the settings.

Automatic - Not Editable
A code is automatically generated for each new item and cannot be changed.

Automatic - Editable
A code is automatically generated for each new item and can be changed.

Manual
: The code field is empty for each new item. A value must be manually added by the user.

automatically generates a default code prefix for each item. For example, the default prefix for activities is `ACT-`. You can change the default prefix by entering information in the **Prefix** field for an item.

If you selected **Automatic - Not Editable** or **Automatic - Editable** in the **Code generation** field for an item, you can also specify a code suffix by entering information in the **Suffix** field.

Specify Code Settings for SAS 360 Plan Items

To specify the code format and generation setting for SAS 360 Plan items in SAS Customer Intelligence 360, click **General Settings** from the navigation bar and select **Tags and Codes** ⇨ **Plan Code Format**. From this page, you can specify the code settings for each level of planning items in the marketing hierarchy.

To specify the code setting for a planning item, select one of the following options in the **Code generation** field.

Note: Code settings do not affect existing planning items. Only new planning items are affected by the settings.

Automatic - Not Editable
: A code is automatically generated for each new planning item and cannot be changed. You can specify a starting code number to generate the first available code. You can enter up to 20 characters for the prefix and the suffix.

Manual
: The code field is left blank for each new planning item. A value must be manually added by the user.

If you selected **Automatic - Not Editable** in the **Code generation** field for a planning item, you can also specify a code suffix by entering information in the **Suffix** field.

10

Analytics

Changes to these settings affect all users and items. For example, when you change the value for the lift in **Test**, that value affects all A/B and multivariate test tasks.

Standard Task

Set the confidence interval for the conversion rate for standard tasks. You can find the confidence interval on the **Insights** tab of a task. The confidence interval is used to determine when a metric is met.

Standard tasks include these types:

- Email
- In-App Message
- Mobile Spot
- Push Notification
- Web

Note: This setting does not affect test tasks such as A/B tasks or web multivariate test tasks.

Test

Set the values that are used to calculate the winner for all test tasks, such as A/B test tasks and multivariate test tasks. These settings affect test variants.

Recommend Winners

The values in the **Recommend Winners** section set the confidence interval, confidence threshold, and lift threshold that must be met so that the system can recommend an overall variant winner.

- **Confidence**: The likelihood that a variant's conversion rate differs from the champion's conversion rate. By default, this value is set to 90%. The valid range is from 75% to 99%.
- **Lift**: Calculated as (variant conversion rate – champion conversion rate) / champion conversion rate. The variant with the largest lift that exceeds both the confidence and the lift becomes the recommended winning variant. By default, this value is set to 0%. The valid range is from 0% to 100%.

Calculate Sample Size

The value in the **Calculate Sample Size** section is used to calculate the minimum sample size needed for A/B tests and multivariate tests. The system uses the number of variants and the **Minimum detectable difference** to calculate the minimum sample size needed for A/B tests. The **Minimum detectable difference** is the minimum difference between the champion's conversion rate and a variant's conversion rate.

Note: By default, this value is set to 1%. The valid range is from 1% to 5%.

Recommendation Task

These settings affect tasks that deliver creatives based on recommendations made by SAS Customer Intelligence 360.

- **Size of control group** specifies which percent of the target audience makes up the control group. The control group is a subset of the target audience that does not receive personalized recommendations. This group is the benchmark that is used to evaluate the effectiveness of the personalized recommendations. Instead of receiving creatives based on recommendations, the creatives that are displayed to a member of the control group are selected randomly. By default, this value is set to 5%.

- **Control group duration** specifies the length of time during which a person remains part of the control group. When the group duration is reached, the person is excluded from the control group and returns to being an eligible member of the target audience. By default, this value is set to 1 day.
- **Recommendations per user** specifies the number of recommendations to show each user. The value that you set here is used by recommendation tasks and is displayed on the **Content** ⇨ **Recommendation Options** tab of a recommendation task.

  Note: By default, this value is set to 10. The valid range of values is from 1 to 20.
- **URL templates for recommended product creatives** is used to locate the creatives that the system recommends to the target audience. You must create at least one URL template before you can create a recommendation task.

  Note: The product identifier that you want the system to base recommendations on should be part of this URL. If the URL that is defined in the URL template does not match the location of the creatives that you want to recommend, the recommendation task cannot be executed.

Control Group

The control group represents a subset of the target audience that receives the control variant or that is assigned to the control path. Use control groups as a benchmark for your variants.

Note: This field sets the size of the control group in activities and tasks.

To update the control group, enter a percent between 1 and 50. By default, this value is set to 5%.

Segment Discovery

When an A/B test task or a web multivariate test task recommends a winning variant, segment discovery searches for segments of the target audience that respond well or poorly to a variant that is different from the recommended winner. After 10,000 users participate in a test task, those participants are categorized into different groups, or bins. Each group is analyzed for discovered segments. The number that you specify here determines the size of each group. After a discovered segment is found, it is displayed on the **Insights** tab. By default, the **Minimum threshold to discover segments** field is set to 1,000.

Set the minimum threshold so thatSAS Customer Intelligence 360 discovers segments at a rate that you feel confident about. For example, if the minimum threshold is too low, the user interface displays many discovered segments, each made up of only a few members. As a result, you risk seeing evidence of segments that do not exist.

If the minimum threshold is too high, it can prevent discovered segments from being displayed. As a result, you might not see patterns that represent legitimate discovered segments.

Also consider the expected response rate for your test. If you tend to get a high response rate from many participants, you can probably select a smaller number for the minimum threshold to discover segments than if you expect a low response rate.

Try to set this threshold so that SAS Customer Intelligence 360 can discover three or four segments per test.

Note: This threshold sets the minimum threshold for all test tasks such as A/B and multivariate tasks.

Segment Profiles

In **Segment Profiles**, you can set the preferences that determine how segment profiles are created.

- **Maximum histogram bins for interval criteria** has a valid range from 6 to 36. By default, this value is set to 12.
- **Maximum number of distinguishing criteria** specifies the number of the most distinguishing profile criteria that are displayed. The valid range is from 1 to 25. By default, this value is set to 10.
- **Sample Size** determines whether segment profiling is performed on a sample of the data or all of the data. If this value is set to 100%, all of the available data is used when profiling segments. By default, this value is set to 100%. The valid range is from 1% to 100%.
- **Maximum missing value rate of criteria** excludes from analysis any variable that has more missing values than the percent that is defined here. By default, this value is set to 50%. The valid range is from 0% to 99%.
- **Maximum categories of character criteria** excludes from analysis any character criteria that have more values than the number that is defined here. By default, this value is set to 100. The valid range is from 1 to 500.
- **Maximum categories of numeric criteria** treats as categorical criteria any numeric criteria with fewer distinct values than the number that is defined here. By default, this value is set to 20. The valid range is from 1 to 100.
- **Minimum distance for distinguishing criteria** is the value used to filter results. Any criteria with a distance that is less than the number specified here are not displayed unless the criteria are report attributes. By default, this value is set to 0. The valid range is from 0 to 1.

11

Plan

Edit the preferences used in Plan, including specifying your plan hierarchy and currency settings. These settings impact the plan items that you create.

About Plan Settings

Plan settings enable you to configure SAS 360 Plan in a way that is most suitable for your organization. Depending on your organization's structure, business needs, financial processes, and marketing goals, you can specify settings to customize your experience using SAS 360 Plan.

For example, you can specify the financial year for your organization, or you can configure settings for multiple currencies, depending on the countries in which your organization conducts business. You can also configure a marketing hierarchy and define settings to manage financial accounts, add cost centers, and enter vendor information into the system.

Configuring General Settings

Manage the Financial Year

Every business has a financial year. An organization's financial year is any 12-month period that is used for accounting purposes.

In SAS Customer Intelligence 360, select the month with which you want to start the financial year. The end month is calculated automatically.

Manage Business Units and Currency Settings

Decide whether plans are going to be based on business units or currency. You can create plans based on a business unit with a specific currency, or you can create plans based on a specific currency without any association with a business unit.

A *business unit* is a division of a company or organization that is responsible for one or more products. An organization can have more than one business unit that corresponds to the branches of the organization. For example, a financial institution could have business units for Retail Banking, Credit Cards, Insurance, and so on. The business units could be distributed geographically. If your organization has multiple business units, each business unit should have its own marketing plan.

Note: If a plan is created for a particular business unit, the plan is not visible across other business units. If a plan is created without a business unit, the plan is visible to the entire organization, depending on the role of a user.

To select the business unit or currency:

1 From the navigation bar, click **General Settings** ⇨ **Plans** ⇨ **Configurations.**

2 In the **Business Unit or Currency Settings** section, select the business unit or currency for the planning item. If you select currency, complete these steps:

- To add currencies to the **In Use** list, click **+** and select the currency. Click **OK**.

  Only the currencies that are listed on the **In Use** tab are available while creating planning items.
- Select a default currency. This currency is selected by default when you create a planning item.
- You can mark a currency obsolete if that currency is not in use.

Replace a Currency

Currencies for a planning item could be changed or replaced in rare cases such as acquisition, a change in location for the headquarters, and so on. You can replace a currency that is used by a planning item with another currency.

To replace a currency:

1 Select the currency that you want to replace.

2 Click .

3 Select a new currency and click **OK**.

If the replaced currency is being used by the existing planning items, this currency is moved to the **Archived** tab. The replaced currency is no longer available for selection when creating planning items.

You can either create a batch job and update the existing planning items all at once or update each planning item manually.

Manage Message Settings

Select **Enable Messages** to enable the user to associate messages with planning items. After you enable the messages setting, a **Messages** tab is available within the **Details** tab of the planning item.

Manage Budget Settings

Select **Cost Centers** to define the budget for your planning items. When you enable cost centers, a list of configured cost centers is available to the user who is defining the budget in a planning item.

Select **Restrict Overbudgeting** to restrict the users from exceeding the budget for the planning item. If the restriction on overbudgeting is enabled, the sum of the cost centers for a distribution for a level cannot exceed the amount that is budgeted for that level.

Managing Marketing Hierarchies

About Marketing Hierarchies

A *marketing hierarchy* defines the different levels of marketing activities and represents the relationships between the activities. Levels are used to organize the marketing hierarchy and to categorize the planning items. When two or more levels are used, the order of the levels establishes a parent-child relationship between the planning items that are associated with these levels.

To create planning items, you must have at least one marketing hierarchy configuration. The marketing hierarchy must contain at least one level.

For more information, see "About Marketing Hierarchies" on page 258.

Based on your organization's needs, an administrator can customize and define the levels in a marketing hierarchy.

Note: You can create only one hierarchy with a maximum of 10 planning levels. You can assign unique values to the planning levels.

The default marketing hierarchy is arranged in this order:

- Level 1 is Plan. In a plan, you can add or associate programs, tasks, activities, and messages.
- Level 2 is Program. Multiple programs can be part of the same plan. In a program, you can add or associate campaigns, tasks, activities, and messages.
- Level 3 is Campaign. In a campaign, you can add or associate tasks, activities, and messages.

Create a Marketing Hierarchy

1. From the navigation bar, click **General Settings** ⇨ **Plans** ⇨ **Marketing Hierarchies**.
2. To add a level in the hierarchy, click **+**.
3. Enter a name and description for the level.
4. (Optional) By default, an icon is selected for the level. To change the icon, click **Change**.
5. Click **Save**.

Edit a Marketing Hierarchy

To edit a level in the marketing hierarchy, click .

Click to edit the configuration of a level. You can control the display of workflows and approvals for each planning level. By default, workflows and approvals are enabled for all the levels in the marketing hierarchy.

Delete a Marketing Hierarchy

To delete a level click .

Note: If a planning item is created at a particular level, then the level is locked, and the delete capability is unavailable for that level.

Configuring Custom Properties

About Configuring Custom Properties

You can create custom properties to gather or share information that is not collected by default in the standard properties for planning items. You can also configure settings to specify how custom properties are used in your marketing hierarchy. Custom properties are assigned to attribute groups, and attribute groups are assigned to categories. Each planning level, planning task, or planning activity can be associated with the selected categories and attribute groups. When you configure the settings, if a category is selected from the **Details** tab of a planning item, the custom properties section displays only the attribute groups (and custom properties) that are related to that category and enabled in that marketing hierarchy. For more information, see “Defining Custom Properties” on page 31.

Configure Custom Properties

To configure relevant custom properties for the planning levels and items in the marketing hierarchy:

1 From the navigation bar, click **General Settings** ⇨ **Plans** ⇨ **Custom Properties**.

The page displays the planning levels and items that are defined in your marketing hierarchy.

2 To select categories and add attribute groups, click for each planning level or item.

3 In the Custom Properties window, click and select one or more categories for that planning level. Only categories that are associated with the planning level are available for selection.

Note: The available categories are determined by the definition in the Microsoft Excel file for custom properties.

4 The default category from the file is automatically displayed in the Categories table. To override the existing default, activate the **Mark Default** switch for another category. You can restore the original default by clicking

Note: After you mark a default category in the table, any default category that is subsequently uploaded from the custom properties file does not automatically override the selected default in the table.

5 To delete a category, click .

Note: If you delete a category, it becomes unavailable for selection in the planning items. Custom properties related to the category that were added in the workflow template settings might affect the workflows that use those templates.

6 Under **Available attribute groups**, select one or more attribute groups for a planning level or item. The selected category determines which attribute groups are displayed for the planning item, depending on what is defined in the Microsoft Excel file for custom properties.

Note: To add attribute groups that are associated with a specific category, you must select the appropriate category.

Your selections are listed under **Selected attribute groups**.

Note: If you remove an attribute group, it becomes unavailable for selection in the planning items. Attribute groups related to the category that were added in the workflow template settings might affect the workflows that use those templates.

7 When you are finished, click **Save** to apply your settings.

Managing Financial Accounts

About Financial Accounts

Adding financial accounts is not mandatory for creating planning items, but it is useful for a planner. Finance and Accounting departments use general ledger entries to track marketing and other expenditures. General ledger codes help the Finance department keep track of entries. The codes are also used to create financial reports. Marketing divisions can use the general ledger codes to track and monitor marketing costs and maintain a record of their expenses when they work with Finance.

With financial accounts, you can add general ledger codes to SAS 360 Plan. Each financial account includes a name, description, and general ledger number. Financial accounts must be associated with cost centers to track expenses.

Add Financial Accounts

1 From the navigation bar click **General Settings** ⇨ **Plans** ⇨ **Financial Accounts**.

2 To add a financial account, click .

3 Enter details for the new account.

Batch Create Financial Accounts Using Microsoft Excel

You can add multiple financial accounts at once by importing a Microsoft Excel template.

To create financial accounts using a Microsoft Excel template:

1 Click ⋮ and select **Download Template**.

2 The Excel spreadsheet contains the template for information that is needed to create the financial accounts. Complete the downloaded template with the details associated with the financial accounts.

3 To import the completed spreadsheet, select **Import Excel**, and then select your spreadsheet. Click **Yes**.

Check the Job Information page on page 428 to view a detailed report of the submitted jobs.

Delete a Financial Account

You can delete a financial account that is not associated with any cost center.

To delete a financial account:

1 On the **Financial Accounts** page, select the financial accounts that you want to delete.

2 Click .

3 Confirm the deletion.

Mark a Financial Account Obsolete

You can mark a financial account obsolete if it was used previously but should not be available in the future. An obsolete financial account does not appear in the selection list when you create a cost center.

1 On the **Financial Accounts** page, open the account that you want to mark obsolete.

2 On the **Edit Financial Account** page, select **Mark as obsolete**.

3 Click **Save**.

Managing Cost Centers

About Cost Centers

A *cost center* is an organizational unit to which costs are allocated for accounting purposes. Cost centers are used to track expenses and determine allocation of direct and indirect costs. In SAS 360 Plan you can use cost centers for budgeting and tracking of expenses.

To enable the cost center settings, from the navigation bar, click **General Settings**, and then under **Plans**, click **Configurations**. In the **Budget Settings** section, select the **Cost Centers** check box. When you enable the cost center settings, you can create a cost center and add a financial account.

The correct general ledger code is automatically added. You can select one or more cost centers to include in your marketing plan, and then distribute the commitment and invoice amounts to cost centers. For more information, see “Budgeting with Cost Centers” on page 270.

Add a Cost Center

1 From the navigation bar, click **General Settings** ⇨ **Plans** ⇨ **Cost Centers**.

2 Click .

3 Enter a **Name** and **Description**.

4 (Optional) Associate an existing financial account with the cost center by selecting an account from the **Financial Accounts** window.

5 Click **Save**.

Batch Create Cost Centers Using Microsoft Excel

You can import data for cost centers using a Microsoft Excel template.

To create cost centers using a Microsoft Excel template:

1. Click ⋮ and select **Download Template**.
2. The Excel spreadsheet contains the template for information that is needed to create the cost centers. Complete the downloaded template with the details associated with the cost centers.
3. To import the completed spreadsheet, select **Import Excel**, and then select your spreadsheet. Click **Yes**.

Check the Job Information page on page 428to view a detailed report of the submitted jobs.

Delete a Cost Center

You can delete a cost center that is not in use.

To delete a cost center:

1. On the **Cost Centers** page, select the cost centers that you want to delete.
2. Click .
3. Confirm the deletion.

Mark a Cost Center Obsolete

You can mark a cost center obsolete if it was used previously but should not be available in the future. An obsolete cost center does not appear in the selection list when you create a planning item.

To mark a cost center obsolete:

1. On the **Cost Centers** page, open the cost center that you want to mark obsolete.
2. On the **Edit Cost Center** page, select **Mark as obsolete**.
3. Click **Save**.

Managing Vendors

About Vendors

Vendors provide services that can be useful in executing tasks for a planning item.

Add a Vendor

1 From the navigation bar, click **General Settings** ⇨ **Plans** ⇨ **Vendors**.

2 To add a vendor, click .

3 Enter a **Vendor Number**, **Name**, and **Description**. Select the **Currency** for the vendor from the drop-down list.

4 Click **Save**.

Batch Create Vendors Using Microsoft Excel

You can import data for vendors using a Microsoft Excel template.

1 Click ⋮ and select **Download Template**.

2 The Excel spreadsheet contains the template for information that is needed to create the vendors. Complete the downloaded template with the details associated with the vendors.

3 To import the completed spreadsheet, select **Import Excel**, and then select your spreadsheet. Click **Yes**.

Check the Job Information page on page 428 to view a detailed report of the submitted jobs.

Delete a Vendor

You can delete a vendor that is not in use.

To delete a vendor:

1 On the **Vendors** page, select the vendors that you want to delete.

2 Click .

3 Confirm the deletion.

Mark a Vendor Obsolete

You can mark a vendor obsolete if the vendor was used previously but should not be available in the future. An obsolete vendor does not appear in the selection list when you create a planning item.

To mark the vendor obsolete:

1. On the **Vendors** page, open the vendor that you want to mark obsolete.
2. On the **Edit Vendor** page, select **Mark as obsolete**.
3. Click **Save**.

12

Calendar

Edit the preferences that customize the look and feel of the calendar. The calendar is one of the views available in **Plans**, **My Workflows**, and **My Workflow Tasks**.

Display

About Display Settings

You can configure calendar preferences and settings to customize the look and feel of the calendar. To configure display settings, from the navigation bar, click **General Settings**, and then select **Calendar** ⇨ **Display**.

Note: Changes to these settings affect all users and items.

Configure Colors by Attribute

For each item that is displayed on the calendar, you can select an attribute that determines the color variants of the item. From the navigation bar, click **General Settings**, and then select **Calendar** ⇨ **Display**. In the **Color Configuration** section, click the drop-down list in the **Attributes** column for an item, and then select an attribute.

For example, for a planning item, you select **Type** from the drop-down list in the **Attributes** column. Items such as plan, program, and campaign are displayed in different colors on the calendar.

For a planning item, you can select one of these attributes:

- No attribute
- Type
- Type and Channel
- Status

If you select **No attribute**, all items are displayed in the same color.

Note: After the tenant is onboarded but before you select an attribute, ensure that the default color variants are configured for each item and its attributes in the calendar definition.

Holidays

About Holidays Settings

You can configure calendar preferences to customize various settings on the calendar. You can add, edit, and manage the holidays list for your organization.

To configure settings for holidays, from the navigation bar, click **General Settings** and select **Calendar** ⇨ **Holidays**.

Add Holidays

To add a holiday, click and in the **Add Holiday** window, complete these steps:

1 In the **Holiday** field, enter the name of the holiday.

2 In the **Description** field, enter the description text.

3 In the **Start date** field, select the date of the holiday.

4 By default, the system automatically considers the End date the same as the Start date of the holiday. If the Start date is different from the End date, in the **End date** field, enter another date. In this case, the holidays are displayed as a date range instead of a single date.

5 Click **Save** to save the settings. Click **Save and add more** to add another holiday in the same window.

Note: In a single calendar year, you can add holidays that range only from January 1 to December 31. To add holidays that extend beyond the current year, you must add the holidays separately for the current year and for the next year. For example, if you add winter holidays starting from a date in the month of December for the current year and extend to a date in the month of January for the next year, you must add the holidays separately for the dates in December and the dates in January.

Search and Filter Holidays

You can search and filter holidays. To search for a holiday by name, enter the name in the search box.

You can filter holidays by year. By default, holidays are displayed for the current year. The list of holidays begins with the holiday that occurs first on the calendar.

To filter holidays for a specified year, click . All of the years for which you entered holidays into the system are displayed. Select a check box for one or more years to display the holidays for the selected years.

Edit Holidays

You can edit the information about the holidays that you have added to the system. To edit the information about a holiday, click the holiday. In the **Edit Holiday** window, you can edit the name, description, start date, and end date for a holiday that occurs in the future. Click **Save**.

Note: You can edit the name and description for a past holiday, but you cannot edit the dates.

To delete a holiday, select the check boxes for one or more holidays and click .

Note: You cannot delete holidays that have occurred in the past.

13

Workflows

Workflow templates represent the workflow process of your organization. You can import, edit, or delete a workflow template.

Managing the Workflow Templates

About Templates

In SAS Customer Intelligence 360, you can import and edit a workflow template. A workflow template represents the workflow process of your organization. The process is illustrated as a series of steps that need to be completed either sequentially or simultaneously.

An approval process can be used to approve or reject information, files, and so on, in a systematic manner. By default, one approval template is available. You can edit the approval template.

Prerequisites for Creating a Template

A workflow template must be created with Business Process Model and Notation (BPMN) version 2.0 and file format *File name*.bpmn20.xml.

These predefined elements are supported for workflow templates:

- Start task
- Sequence flow
- Conditional sequence flow

- User task
- Exclusive, Parallel, and Inclusive gateway
- End task

TIP Errors are shown when the templates are invalid and the predefined elements are not supported.

Import a Workflow Template

1. From the navigation bar, click .
2. In the **Workflow** section, click **Templates**.
3. Click .
4. Browse and select the file.
5. Enter a description for the file and click **OK**.

By default, the template is in a draft state.

Edit a Workflow Template

You can edit the templates that are in a draft state.

To edit a template:

1. Select the template.
2. Click .
3. On the **Properties** tab, you can perform these tasks:
   - Add and edit the name and description.
   - In the **Categories** field, click **Add Categories** and select a category for the workflow template. To add additional categories, click and select one or more categories.

     Note: Only categories that are associated with the workflowProcess object type are available for selection. The available categories are determined by the definition in the Microsoft Excel file for custom properties.
   - In the Categories table, you can activate the switch to mark only one category as the default. Specifying a default category is optional.

     Note: If you specified a default category for the workflowProcess object type in the custom properties file, the default category is automatically displayed in the table. To override the existing default, activate the switch to mark another category as the default. After you mark a default category in the table, any default category that is subsequently uploaded from the custom properties file does not automatically override the default category in the table.

- In the **Attribute groups** field, select one or more attribute groups from the **Available attribute groups** section and add them to the **Selected attribute groups** list.

  Note: Only attribute groups that are associated with the workflowProcess object class (and not with categories) are available for selection. The available attribute groups are determined by the definition in the Microsoft Excel file for custom properties. All instances of workflows that are created from this template display the selected attribute groups.

  To add attribute groups that are associated with specific categories, select the appropriate categories. The selected categories for workflow instances that are created from this template determine which of the associated attribute groups are displayed.

- In the **File catalog** field, enable or disable the file cataloging. If you enable file cataloging, workflow users can catalog files from a workflow to the asset library.

4. On the **Workflow Tasks** tab, you can edit the task details. For more information, see "Edit Workflow Task Configuration" on page 125.

5. On the **Orchestration** tab, you can publish the workflow templates that are in a draft state, or you can unpublish a published template.

6. Save the changes.

Edit Workflow Task Configuration

Click the task to view its details.

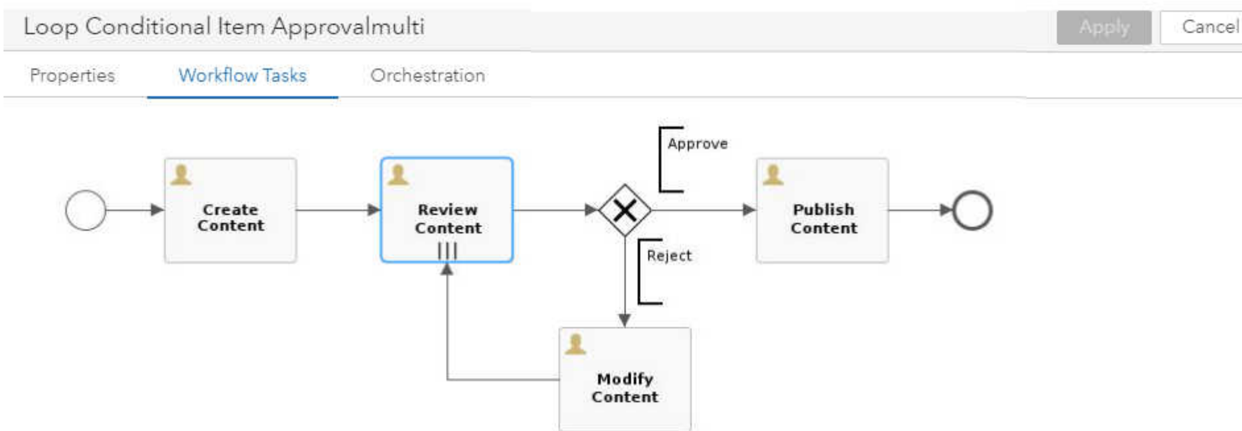
- On the **Basic Settings** tab, you can edit these details:
  - Change the name and description.
  - Change the type of task to generic or item approval.
  - If you select **Item Approval**, select at least two status values from this list:
    - **Approve**: Approve the content with no further changes.
    - **Reject**: Changes need to be made and another approval task might be required.
    - **Approve with comments**: Changes should be made to content with no further approval.
  - In the **Response comments** field, activate the switch to enable contributors to add comments in response to their assigned workflow tasks. Select the **Required field** check box to configure the **Response comments** field as a mandatory field.
  - In the **Response resources** field, activate the switch to enable contributors to add and upload resources that support their assigned workflow tasks. Select an option to add response resources:
    - Select the **File upload** check box to enable the uploading of files.
    - Select the **Add URL** check box to enable adding a hyperlink.

    Note: You must select at least one option to add resources.

Select the **Required field** check box to configure the **Response resources** field as a mandatory field.

- Determine whether it is a multi-user task or single-user task.
- Add the default contributors and the default duration the contributor should choose to complete the task.
- When it is a multi-user task, you can add global instructions. These instructions are visible to all of the contributors.
- Select the option to show a link in the task so that the contributor can view details of the associated workflow.

- On the **Data Sharing Options** tab, you can configure and define the flow of the workflow tasks.



In this workflow example, you can complete these actions:

- Select the preceding task. For the first task in the workflow, no task is available from the drop-down list. For the subsequent tasks and the previous tasks (and in the case of a condition), the task in a cyclic loop after the condition is listed. For example, the **Review Content** task, the **Create Content** task, and the **Modify Content** task are available for selection.
- Select the data for input. The input that you select is the response of the task that you selected in the preceding workflow task.
- Select the option to show a link in the task for the contributor. The contributor can view details of the source item and where the workflow was initiated.
- Select the properties from the source item. Next, select the field information that you want to transfer from the planning item and the workflow process to the workflow task. Select the field and click ➡ to add one field at a time. To add all the fields, click ⏩.
- To define a condition, select an arrow. When you position your pointer on an arrow, the arrow is highlighted and the cursor changes to a hand cursor. For example, to define the variable for the condition, click the arrow after the condition that follows the **Review Content** task. Select a data field from the list to map to the variable that is defined in the data condition arrow. You can define additional data fields if the fields are available in the template.

  Note: Ad hoc and dependent fields are not available for the mapping of conditions.

When the custom properties for planning items are not associated with a category and are assigned to multiple planning levels in the marketing hierarchy, only the common custom properties across the levels are available for data sharing and mapping of conditions in the workflows task configuration. When the custom properties for planning items are associated with a category and are assigned to multiple planning levels in the marketing hierarchy, all of the unique categories across levels are available for data sharing but none are available for conditional mapping.

Delete a Workflow Template

You can delete a workflow template that is in a draft state or that is not in use.

To delete the workflow template:

1. Select the template.
2. Click .

Edit an Approval Template

By default, one approval template is available. The default approval template is named “Planning Item Approval”. Although you cannot import an approval template, you can edit the template that is available to match your business needs.

1. Select the template.
2. Click .
3. By default, the approval template is active. To edit the template, mark the template inactive. Navigate to the **Orchestration** tab and click **Mark Inactive**.
4. On the **Properties** tab, you can edit the name and description.
5. On the **Workflow Tasks** tab, you can edit the task details. Click the task to view its details.
   - Make the response comments mandatory. When a contributor responds to a task, adding a comment to the response is mandatory.
   - Add the default contributors and the default duration the contributor should choose to complete the task.
   - Add global instructions as required.

Click **Apply** to save the changes. To initiate an approval, be sure to mark the template active.

14

Assets

Edit the preferences to configure the custom renditions for an asset. These settings impact the file types of the custom renditions that are generated for an asset.

Configure Custom Renditions

You can configure settings for the custom rendition types for the asset files that you upload. You can define one or more configurations for the custom renditions. In a configuration, you can specify one or more source file types and the resulting file type. The resulting file type indicates the format of the custom rendition that is autogenerated when you upload an asset file. You can also specify the dimensions for the custom rendition.

To add a configuration custom rendition:

1. From the navigation bar, click **General Settings** and select **Assets** ⇨ **Custom Renditions**.

   The **Custom Renditions** page displays all of the configurations that you have added and information about the selected source and resulting file types.

2. In the **Name** field, add the name of the configuration.
3. In the **Source file types** field, from the **Available items** list, select one or more source file types for a rendition. Selections are displayed below **Selected items.**
4. In the **Resulting file type** field, select a file format that is autogenerated when you upload one of the selected source file types for the custom rendition.
5. In the **Dimensions** field, select a radio button:

   Default
   : The default width and height are considered for the rendition.

   Custom
   : You can specify the width and height for the rendition in pixels.

6. Click **Save** to save the settings. Click **Save and add more** to add more configurations for custom renditions.

PART 3

Global Concepts

15

Working with SAS Customer Intelligence 360

Using SAS Customer Intelligence 360

Overview

Before you add content to SAS Customer Intelligence 360, set up a plan to track your marketing efforts, share your plans with your organization, and define the parameters of your budget. You can then track expenses.

When you prepare content in SAS Customer Intelligence 360, you first identify the customers that you want to reach, create the locations where the content appears, and define the actions that make up the customer interactions with your content.

Then, you design the messages that contain your content. You create the tasks and activities that delivers the content to your customers.

When your tasks or activities are ready, you publish them to a location where they are displayed to customers. You can then analyze the results of customer interactions, and compare the effectiveness of different creative materials.

Planning

Create a Planning Hierarchy

Create a planning hierarchy that organizes marketing plans and budgets.

For more information, see “Managing Marketing Hierarchies” on page 110.

Allocate a Budget

Enter the budgets for the levels in your planning hierarchy.

For more information, see “Allocating Budgets” on page 264.

Create Segments

Create the segment, or target audience, for your message. For example, you might create a segment of women over the age of 50 who live in a particular area. The marketer can use the segment in many tasks and use task targeting to narrow the focus, depending on the message. You can create many segments for a number of different messages.

For more information, see “About Segments” on page 471.

Create Spots

Identify the spots, or locations, where your content is displayed. For example, you might select a particular area on the home page for your company. You can create a spot for a mobile application (app) or a web page.

For more information, see “Creating Web Spots” on page 699.

Create Events

Identify the events that describe how customers interact with your content. For example, you might create a page view event that is triggered when a customer views your web page. Events are included in data views. For more information, see “About Data Views” on page 459.

Designing

Create Content

Create and organize the content that you want to deliver to your customers. *Creatives* represent the content that is displayed in a web page, email, or mobile app. You can import assets as creatives, or design creatives using HTML.

Use a message to group related creatives together. A message can contain creatives meant for different channels. For example, a message can contain an image meant for display in an app and an image meant for a web page.

Create Tasks

Create a task that delivers content to your customers in a specific channel. You can create tasks for mobile, web, and email channels. For example, you could create a task that delivers a discount coupon in a mobile channel.

For more information, see "About Web Tasks" on page 708.

Create Activities

Use the activity map to create an activity that combines tasks and conditions to meet the goals of your marketing campaign. For example, you could design an activity to target and reward bank customers who make regular deposits to their savings accounts. For more information, see "Creating an Activity Map" on page 746.

Schedule Tasks

Schedule a task to specify the dates when content is available. For example, a discounted offer might be available only from May 1 to May 5.

Mark Ready and Publish

When an event, spot, or creative is marked ready and published, it becomes available to other people at your site who can then include it in a message or task.

When a task or activity is marked ready and published, the content becomes available to customers within the constraints of the schedule. Tasks can be published independently or as part of an activity.

View Results

When a task or activity is published, you can view the results of customer interactions with your content.

The **Insights** tab in a task displays conversion rates, number of users, and the performance of variants in creatives.

The **Insights** tab in an activity displays metrics from individual tasks that are used in the activity.

About Status

Items have a status to indicate their state and whether they are ready to be used in other items. You can update and view the status of an item on the **Orchestration** tab. The available statuses are Designing, Ready, Scheduled, Active, Active - Metrics Only, and Completed. Before an item can be published, all of the items within that item must have a Ready or Active status. In this way, an item is dependent on the status of its contained items. One contained item can prevent an item from publishing successfully. To see a list of all items associated with a particular item, navigate to **Orchestration** ⇨ **Usage**.

Planning

When a marketer creates a task or activity from a planning item, the system automatically assigns a Planning status to that task or activity. A Planning status indicates that the item is associated with a planning item and that the item is missing details required for activation.

Designing

This is the initial status of an item, except for tasks or activities created from **Plans.** Use the Designing status to indicate that your item is in progress and might not be ready for publishing. A Designing status does not prevent items from being included in other items. This status enables two items to be designed concurrently. For example, one user can design a creative while another user designs the task that contains that creative. Except for activities, changes to an item with a Designing status are not validated. An activity cannot be saved until it has been validated, even if it has a Designing status.

You cannot publish an item if it contains items that have a Designing status. For example, if you have a task that includes creatives, and one of those creatives has a Designing status, that task cannot be published.

Ready

When you finish creating an item, you can mark it Ready. Marking an item Ready is useful when you are collaborating with a team and each team member owns different items that are used by the same task. Marking an item Ready indicates to the user creating the task that your item is ready to be used. When you click **Mark Ready**, the contents of the item are validated and its status changes from Designing to Ready. Items with a Ready status allow publishing when they are included in other items. If you are publishing an item that contains Ready items, you are prompted to publish the dependent items as well.

For example, suppose that you have a task that contains a creative, and that creative has a Ready status. When you try to publish the task, a message indicates that the task contains a dependent item that does not have an Active status. If you continue with the publish, your task and its creative are both published. As a result of a successful publish, the status of your task and your creative changes from Ready to Active.

If your task has a Ready status and you have specified a start date, the task is not automatically published when the start date is reached. A task must be published in order for the start date to activate the task.

Items with a Ready status can be returned to Designing or moved to Scheduled or Active. Items can also be left in a Ready status until an item dependent on them is published.

Scheduled

When a schedule has been set and the task or activity is published but its start date has not been reached, that item has a Scheduled status. When the start date is reached, the status changes to Active. Navigate to **Orchestration** ⇨ **Schedule** to set the start and end dates.

Changes to a scheduled task or activity are not automatically propagated to the published version. You must republish after you save to resolve the Out of Sync status. For more information, see “Republishing Out of Sync Items”.

A task or activity with a Scheduled status cannot be returned to Ready or Designing.

Active

An item has an Active status when it is published. If the item has a schedule, then its status changes to Active only after the item is published and its start date has been reached. Changes to an active item are not automatically propagated to the published version of that item. You must republish the item after you save it to resolve the Out of Sync status. For more information, see “Republishing Out of Sync Items”.

If you are working in an activity, you cannot add a task with an Active status. Instead, a copy of the task is created for you. The new task, which has a Designing status, is added to the activity map.

Active - Metrics Only

In tasks that have set schedules, you can select **Extend metrics analysis** to extend the period of data collection after the end date of the task. During the extended period of data collection, the status is Active - Metrics Only. This status indicates that the task has ended, but that it is still collecting data.

The status changes to Complete when the **Extend metrics analysis** period is over.

Complete

If the end date or extended data collection period of a scheduled item is reached, or the item is ended manually, then the item's status changes to Complete. Complete items do not collect new data and cannot be modified. Ending an item makes its content unavailable. In addition, any unsaved changes are lost.

Republishing Out of Sync Items

Synchronize Content

If the content of a published item is changed and saved, that item becomes out of sync with the published version. To synchronize the content, select **Republish**. Otherwise, the item stays out of sync with the published version and the updates are not delivered.

Synchronize Activity Content

If an item is part of a published activity and the item has been changed, both the activity and the item become out of sync. Republish the activity to synchronize all of the content. For example, if a task is part of a published activity and the task schedule is changed, republish the activity to synchronize the task content with the published version.

Synchronize Task Content

If an item is part of a published task and the item is changed, the task is not out of sync, even though the item is. Republish the out of sync item to deliver the updated content. For example, if an event is used in targeting in a published task and the event is changed, the task is not out of sync. The event is out of sync and must be republished to deliver the updated event content.

Searching for Content

Find an item by entering text in the search field on the SAS Customer Intelligence 360 Home page. The search includes these SAS Customer Intelligence 360 objects on the current tenant that you have permission to access:

- activities
- assets
- messages
- segments
- spots
- tasks

You can search for whole words that are separated by blank spaces. For example, suppose that you want to find objects that contain the string “Customer Intelligence.” Enter `customer` in the search field.

Append a percent sign (%) at the end of a search string to find words that begin with that string. For example, to list all of the objects that contain the word `customer`, enter `cust%` in the search field.

> **TIP** The search function evaluates an underscore (_) as part of a string. For example, to include the string “first_task” in the results, enter `first%` in the search field.

Here are some considerations for searching:

- Search results are not case-sensitive.
- By default, search results are sorted by relevance. You can change the sort order so that results are sorted by title or date instead.
- You can also filter search results by type, by who last modified the item, or by date modified.
- Search results are not ranked.

Note: Access permissions might not allow you to find items in a global search. In this case, if you have access to a component, click on the component in the navigation bar to view the contents.

For example, if you have access to Plans, you might not be able to view the items in Plans from the SAS Customer Intelligence 360 Home page. Click in the navigation bar and use the **Filter** field to search for an item.

16

Setting Standard and Custom Properties

Standard Properties

Setting Standard Properties

When you are viewing an item, navigate to the **Properties** tab to see common information about the item. The **Standard** section contains basic information about the item, such as the name, type, description, category, and external code.

Note: Not all fields in this section are required.

Some of the fields in the **Standard** section include the following:

- The **Category** field is displayed only if the properties available in the system have been assigned a category.
- The **Code** field is needed to map treatments from external applications.

  When a treatment is imported or migrated to SAS Customer Intelligence 360 from an external application such as SAS Marketing Automation, the existing value for the object appears in the **Code** field. Depending on the code settings for your environment, the code value might be editable. This value is not required to be unique to be valid. If the value is editable, you can change it to match the code value for another item. Valid characters for codes are alphanumeric characters, multi-byte characters, numerals, underscores, hyphens, and periods. Blank spaces are not allowed in code formats.

  The code is also used as the unique identifier for a creative when the creative is served as part of a staged creative web or mobile HTML task. For more information, see “Select the Task Type” on page 733.

Note: External codes and dynamic tags are intended for use with a staged creative task. If you use a creative with a dynamic tag in a web task that is not a staged creative task, only the default tag value is displayed on the content that the task delivers.

In the **Custom** properties section, add, remove, or select custom properties. For more information, see "Custom Properties".

Custom Properties

Custom properties enable you to supplement the standard properties of an object (such as name, description, and type) with more properties that are specifically applicable to your goal or organization. Custom properties can then be used for a variety of purposes, such as storing object-specific information and personalizing messages and creatives.

About Custom Properties

Custom properties are defined in a Microsoft Excel spreadsheet. This spreadsheet provides the definition for each property and includes this information:

- a group that the property belongs to. This group can be used to categorize sets of custom properties that are similar.
- predefined values or the accepted value type. For example, the property could be a Boolean value, a picklist, a number, and so on.
- the object types that the property is associated with. Custom properties can be assigned to assets, creatives, messages, planning items, and workflows.
- dependencies between the property and its values. Defining dependencies enables you to filter what displays based on the value of the property.

After you upload the spreadsheet the spreadsheet, the custom properties appear in the **Custom Properties** section of an item's **Properties** page.

For SAS 360 Plan, you can configure custom properties to appear based on hierarchy or group settings. For more information, see "Configuring Custom Properties".

Download the Custom Properties Spreadsheet

1 From the navigation bar, navigate to **General Settings** ⇨ **Data Management** ⇨ **Data Sources**.

2 Download the custom properties spreadsheet.

   - If there are no data sources, click **Download Custom Properties Template**.
   - If there is a table of existing data sources, click from the toolbar above the table.

Custom properties that are already defined can be modified in the spreadsheet. If there are no custom properties, then you can use the spreadsheet as a template to define new ones.

Define Custom Properties

Complete the Attributes Worksheet

Populate the Attributes worksheet to define attribute groups and attributes.

1 In the first four columns, define the attribute groups.

Table 16.1 Attribute Group Columns in Attributes Worksheet

Name	Description
Attribute Group Name	The group for one or more custom properties. Attribute groups are a way to organize attribute names based on a common category.
Attribute Group Display Text	The group's name that is displayed in the user interface.
Attribute Group Description	The description for the attribute group.

<table>
<tr><th>Name</th><th>Description</th></tr>
<tr><td>Class</td><td>The object class for an attribute group. This value should match the name of a domain class that already exists.

Here are the predefined values that you can use:
■ <code>creative</code>
■ <code>digitalAsset</code>
■ <code>directMarketingTask</code>
■ <code>emailTask</code>
■ <code>externalTask</code>
■ <code>inAppMsgTask</code>
■ <code>message</code>
■ <code>mobileSpotTask</code>
■ <code>mobileSpotABTask</code>
■ <code>planningObject</code>
■ <code>pushNotificationTask</code>
■ <code>segment</code>
■ <code>segmentMap</code>
■ <code>webABTask</code>
■ <code>webMVTTask</code>
■ <code>webTask</code>
■ <code>workflowProcess</code>

Note: When you upload custom property definitions to SAS Customer Intelligence 360, a domain class is removed from a group only when there is another group that includes the same class.</td></tr>
<tr><td>Associated Categories</td><td>The categories that are associated with the class. These values correspond to the category types in the Categories worksheet.

Use a new row for each associated type.</td></tr>
</table>

2 In the remaining columns, define individual attributes that belong to the attribute groups.

Table 16.2 Attribute Name Columns in the Attributes Worksheet

Name	Description
Attribute Name	The system name for the custom property. Enter individual attributes for the attribute groups on the next row. For example, if you defined the attribute group on row 2, define the first attribute in that group on row 3. Row 3 should have no values in the first two columns (Attribute Group and Associated Categories).
Display Text	The user interface text for the attribute.
Description	The description for the attribute.
Data Type	The data type. Data type can be one of these values: ■ **`Boolean`** ■ **`date`** Values must match the Date format: `yyyy-MM-dd` ■ **`datetime`** Values must match the SimpleDateFormat structure: `yyyy-MM-dd'T'HH:mm:ss'Z'` ■ **`double`** ■ **`integer`** ■ **`text`** Note: Dynamic properties must use the **`text`** type. Only **`double`**, **`integer`** , and **`text`** are supported for the multi-select UI type.

<table>
<tr><th>Name</th><th>Description</th></tr>
<tr><td>UI Type</td><td>(Optional) Specifies the user interface type. UI type can be one of these values:

<code>checkbox</code>
<code>dropdown list</code>
Values for this type are populated from the Picklist Value Source column.
Note:
You cannot change the UI type from <code>dropdown list</code> to <code>multi-select</code>.
<code>multi-line</code>
<code>multi-select</code>
Values for this type are populated from the Picklist Value Source column.
When you define a multi-select list that uses dependencies, the dependent lists are an aggregation of dependency results for all the parent values.
<code>read-only</code>
Read-only properties cannot be modified in the user interface. The value displayed is the value that is specified in the Default Value column of the Attributes worksheet.
</td></tr>
<tr><td>Format</td><td>(Optional) Specifies the format for the data type. These currency types are supported:

<code>DOLLAR10.0</code> or <code>DOLLAR10.2</code>
<code>EURO8.0</code> or <code>EURO8.2</code>
<code>YEN10.0</code> or <code>YEN10.2</code>
<code>POUND7.0</code> or <code>POUND7.2</code>
<code>WON15.0</code> or <code>WON15.2</code>
</td></tr>
</table>

Name	Description
Constraints	(Optional) Specifies constraints on the values. Separate constraints with a semicolon. For example, you could set these values as constraints: ■ `min=-20000` ■ `max=20000` ■ `min=-20000;max=20000` ■ `maxlength=150` Note: This constraint can be applied only to a property that uses the text data type. ■ `maxLines=8` In the user interface, a scroll bar appears when the maximum number of lines is exceeded. Note: This constraint can be applied only to a multi-line type or read-only type.
Default Value	(Optional) Specifies a default value. For the multi-select UI type, values must be separated by semicolon delimiters. Examples are `India;Australia;France` or `10;20;70`. Note: For the multi-select UI type, the value should not contain semicolons because these are used as delimiters.
Required	Specifies whether an attribute must be set. The value can be `true` or `false`.
Search Field	Specifies whether the attribute can be found through a search.

Name	Description
Picklist Value Source	The picklist that is associated with this attribute. You can define values in two ways: ■ Define values in the Picklists worksheet. Set the value to the name of the Picklists worksheet combined with the picklist name: Picklists.*<picklist name>* ■ Populate values from a table-driven worksheet. Set the value to the name of the table-driven worksheet combined with the picklist’s column: *<TableName>.<column name>* For example, if the worksheet name is “Table-Cities”, and the column is named “Country”, the value for the PickList Value Source column would be Table-Cities.Country. To filter or cascade values from either type of picklist, you must set up dependencies between their values.
Obsolete	Specifies whether the attribute or attribute group is obsolete. The value can be **true** or **false**. Note: If you want to set a custom property (or attribute group) and the associated picklist to obsolete, you must use two separate uploads. In the first upload, set the custom property or attribute group to obsolete. In the second upload, set the picklist to obsolete.

Name	Description
Ad Hoc	Specifies whether this property is added through the user interface. The value can be **true** or **false**: ■ When the value is **true**, the custom property is not associated with an object by default. You can add the property later to an object by clicking **+** in the **Properties** panel for an object. Note: If an ad hoc property is the parent of a dependent property, then the dependent displays all its possible values when the ad hoc property is not present. If the ad hoc property is added, then the ad hoc property acts a filter based on its value. ■ When the value is **false**, the property is always displayed in an object's custom properties.
Dynamic	Specifies whether the custom property's value is populated dynamically by another product or solution. The value can be **true** or **false**: ■ When the value is **true**, the custom property is associated with an object, but the value is not displayed until an external solution provides it through the external API gateway. For example, SAS Real-Time Decision Manager can inject a treatment's custom details into a corresponding dynamic property. Dynamic properties can be associated only with creatives. These creatives must then be used in a staged creative task that is associated with an external application. For more information, see "Creating a Staged Creative Web Task". ■ When the value is **false**, the custom property is set in SAS Customer Intelligence 360.

Complete the Categories Worksheet

Modify the Categories worksheet to define object types that are associated with each domain class.

These are the columns in this worksheet:

Table 16.3 Columns in the Categories Worksheet

Name	Description
Object Type	The type of the object. Here are the predefined values that you can use: ■ `creative` ■ `digitalAsset` ■ `directMarketingTask` ■ `emailTask` ■ `externalTask` ■ `inAppMsgTask` ■ `message` ■ `mobileSpotTask` ■ `mobileSpotABTask` ■ `planningObject` ■ `pushNotificationTask` ■ `segment` ■ `segmentMap` ■ `webABTask` ■ `webMVTTask` ■ `webTask` ■ `workflowProcess`
Category Value Name	The name of the category as it is stored in the system.
Category Display Text	The text that is displayed in the user interface for the category.
Default	(Optional) Specifies which of the types is the default. The value can be `true` or `false`. If a value is not present, it is assumed to be false.
Obsolete	Specifies whether the attribute or attribute group is obsolete. The value can be `true` or `false`. Note: If you want to set a custom property (or attribute group) and the associated picklist to obsolete, you must use two separate uploads. In the first upload, set the custom property or attribute group to obsolete. In the second upload, set the picklist to obsolete.

This example shows what a Categories worksheet might look like in Microsoft Excel:

	A	B	C	D	E
1	**Object Type**	**Category Value Name**	**Category Display Text**	**Default**	**Obsolete**
2	planningObject	Plan	Plan	FALSE	FALSE
3	planningObject	Program	Program	FALSE	FALSE
4	message	Category_Promotion	Category Promotion	TRUE	FALSE
5	message	Category_Artikelabbildung	Artikelabbildung	FALSE	FALSE
6	planningObject	Campaign	Campaign	FALSE	FALSE

Complete the Picklists Worksheet

Modify the Picklists worksheet to define picklists for specific properties. A *picklist* is a set of predefined values that a user can select for a property.

These are the columns in this worksheet:

Table 16.4 *Columns in the Picklists Worksheet*

Name	Description
Picklist Name	The name of the picklist in the system.
Picklist Display Text	The text that is displayed in the user interface for the picklist.
Picklist Description	The description for the picklist.
Picklist Data Type	The data type. Picklists can use these types: ■ `integer` ■ `double` ■ `text`
Picklist Value Name	The values for the picklist as they are stored in the system. Note: Picklist values should not contain semicolons. When you enter these values, leave a blank cell in the same row as the picklist definition. Enter the values in the subsequent cells of this column. See the Picklist Example on page 152 for an illustration.
Picklist Value Display Text	The text in the user interface that is displayed for each of the picklist's values. When you enter these values, leave a blank cell in the same row as the picklist definition. Enter the values in the subsequent cells of this column. See the Picklist Example on page 152 for an illustration.

Name	Description
Obsolete	Specifies whether the picklist is obsolete. The value can be `true` or `false`. Note: If you want to set a custom property (or attribute group) and the associated picklist to obsolete, you must use two separate uploads. In the first upload, set the custom property or attribute group to obsolete. In the second upload, set the picklist to obsolete.

This example shows what a Picklist worksheet might look like in Microsoft Excel.

	A	B	C	D	E	F	G
1	Picklist Name	Picklist Display Text	Picklist Description	Picklist Data type	Picklist Value Name	Picklist Value Display Text	Obsolete
2	season	Season	season of the year	text			FALSE
3					spring	Spring	FALSE
4					summer	Summer	FALSE
5					fall	Fall	FALSE
6					winter	Winter	FALSE
7	colors	Colors	color choice for shirts	text			FALSE
8					white	White	FALSE
9					blue	Blue	FALSE
10					green	Green	FALSE
11					red	Red	FALSE

Create Worksheets for Table-Driven Properties

Define worksheets for table-driven custom properties. This enables you to cascade or filter values by referencing a table worksheet in the Microsoft Excel file.

For example, you might have location data in another system with entries for cities that includes columns for country, state, and ZIP code. You can export the values from the external system and paste them into a tables tab in the Microsoft Excel spreadsheet for custom properties. Then, when you define a picklist for this property, you can reference the table to automatically populate the values.

1 Create the worksheet and populate it with values. The column values are specific to the data that you need to populate. For example, this worksheet named Table-Cities contains values for continents, countries, and cities.

	A	B	C
1	**Continent**	**Country**	**City**
2	Africa	Congo	Aba
3	Africa	Congo	Beni
4	Africa	Congo	Daein
5	Africa	Sudan	Khartoum
6	Asia	China	Beijing
7	Asia	China	Shanghai
8	Asia	India	Pune
9	Asia	India	Bangalore
10	Asia	India	Mumbai
11	Asia	Japan	Tokyo
12	Europe	United Kingdom	London

2 In the Attributes worksheet, set the Picklist Value Source column to `<TableName>.<ColumnName>`.

For example, if the worksheet name is “Table-Cities”, and the column is named “Country”, the value for the PickList Value Source column would be `Table-Cities.Country`.

Complete the Dependencies Worksheet

Modify the Dependencies worksheet to create filtered (or cascading) relationships between custom properties.

Note: The Dependencies worksheet is used to define relationships only. Custom properties must be defined in the Attributes worksheet (and present in a table-driven worksheet if applicable).

Defining the Dependencies

These are the columns in the Dependencies worksheet:

Table 16.5 *Columns in the Dependencies Worksheet*

Name	Description
Dependency Name	The name of the dependency. The name is used for warnings and error messages to indicate where a problem exists.

Name	Description
Dependency Type	The behavior type of the dependency. Set the value to one of the following options: ■ `value`. Use this option when you have cascading dependencies (or values) that are used with drop-down lists or multi-select lists. For example, see "Example: Value Dependencies with a List and Check Box" or "Example: Value Dependencies for Cascading Lists". ■ `visibility`. Use this option when a property or list of properties should be visible only when the parent property has a certain value. The values for the parent property are set in the Parent Attribute Value column. For example, see "Example: Visibility Dependency for a Picklist".
Dependent Attribute Group Name	The group that the specified dependent attribute belongs to. This group corresponds to a value in the Attribute Group Name column of the Attributes worksheet. Note: This dependent must be in the same group as the parent.
Dependent Attribute Name	The name of the dependent attribute. This name corresponds to a value in the Attribute Name column of the Attributes worksheet.
Parent Attribute Group Name	The group that the specified parent attribute belongs to in the Attributes worksheet. This group corresponds to a value in the Attribute Group Name column of the *Attributes* worksheet. Note: The parent must be in the same group as the dependent. Values should start one row lower than the row with the dependent's name and group. For an example, see the "Example: Value Dependencies with a List and Check Box".

Name	**Description**
Parent Attribute Name	The name of the parent attribute. This name corresponds to a value in the Attribute Name column of the Attributes worksheet. Values should start one row lower than the row with the dependent's name and group. For an example, see the "Example: Value Dependencies with a List and Check Box". When you specify the parent attribute, keep these restrictions in mind: ■ A dependent can have only one parent. ■ The parent attribute cannot be a dynamic attribute (that is, the Dynamic column in the *Attributes* worksheet cannot have a value of `true`). ■ If an ad hoc property is the parent of a dependent property, then the dependent displays all its possible values when the ad hoc property is not present. If the ad hoc property is added, then the ad hoc property acts a filter based on its value.
Parent Attribute Value	The values that must be entered by the user in order to show the dependent attribute. This value must be of the same data type that is specified for the parent attribute. To specify multiple values, use a semicolon (;) as the delimiter. For a multi-select field, an OR operator is used to evaluate the set of values. Values should start one row lower than the row with the dependent's name and group. For an example, see the "Example: Value Dependencies with a List and Check Box". Note: When using table-driven worksheets, leave this value blank and enter a value for Table Column instead.
Table Column	The value of a column in a table-driven worksheet. The value for this column is evaluated based on the value of the Operator column.
Operator	The operator used to evaluate the Table Column entry. Valid operators are `eq` or `ne`. Tip: The user interface does not indicate which operator is being used. If you use the `ne` operator, give the custom property a name that indicates how input values are used.

Example: Value Dependencies with a List and Check Box

For this example, custom properties are set up to display a drop-down list of brands and filter the values if they are discounted.

1 Define the attributes. Assume that the following custom properties are defined in the Attributes worksheet (values in hidden columns are blank):

	A	B	C	D	F	G	I	J	N	P	Q	R	S
1	**Attribute Group Name**	**Attribute Group Display Text**	**Attribute Group Description**	**Class**	**Attribute Name**	**Display Text**	**Data Type**	**UI Type**	**Required**	**Picklist Values Source**	**Obsolete**	**Ad Hoc**	**Dynamic**
2	BrandSelection	Brand Selection	Select the brands associated with this item.	message, creative							FALSE		
3					attr_busunit	Business Unit	Text	Dropdown list	FALSE	Table-BrandsFake.BusinessUnit	FALSE	FALSE	FALSE
4					attr_discount	Discounted	Boolean	Checkbox	FALSE		FALSE	FALSE	FALSE
5					attr_brands	Brand Name	Text	Multi-select	FALSE	Table-BrandsFake.Brand	FALSE	FALSE	FALSE

This is an example of values that are defined by the Table-FakeBrands worksheet.

	A	B	C	D
1	**Brand**	**ProductCategory**	**BusinessUnit**	**Discounted**
2	Artesian Life	Bottled water	Drinks	TRUE
3	Norwegian Mountain	Bottled water	Drinks	TRUE
4	Purier	Bottled water	Drinks	TRUE
5	Swift Creek	Bottled water	Drinks	FALSE
6	Corny Flakes	Cereals	Foods	FALSE
7	Heroes of the Bowl	Cereals	Foods	FALSE
8	Marshmallow Sugar-Os	Cereals	Foods	TRUE
9	Oat Blands	Cereals	Foods	FALSE
10	Fizzer	Soda	Drinks	FALSE
11	Diet Fizzer	Soda	Drinks	FALSE
12	Caffeine-Free Fizzer	Soda	Drinks	TRUE

2 Set up the brand dependencies that depend on the business unit and discount. This example shows the values to set up these dependencies.

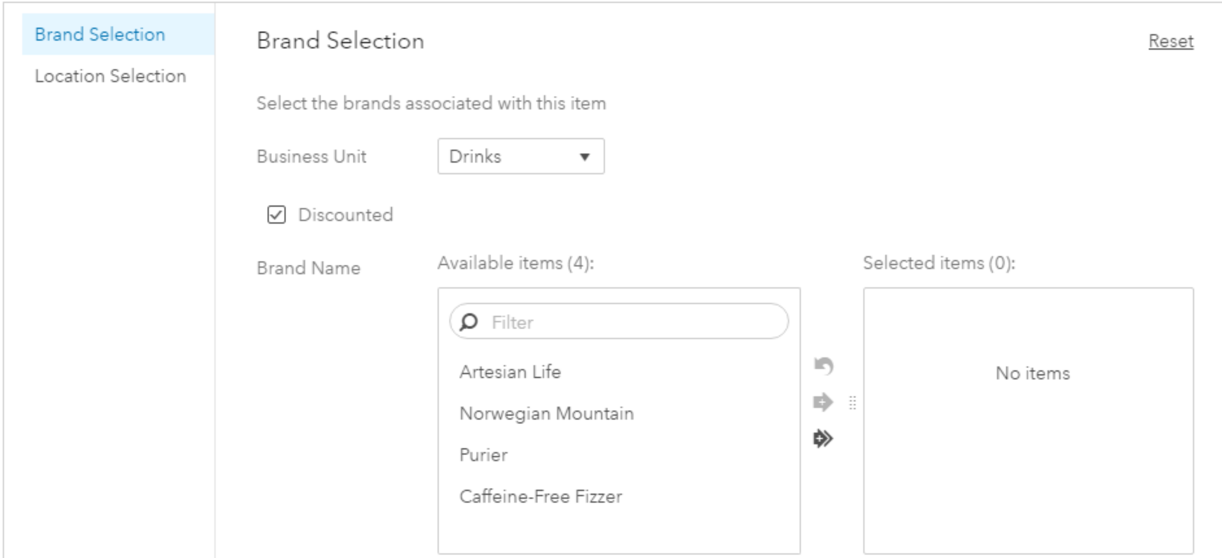
	A	B	C	D	E	F	G	H	I
1	**Dependency Name**	**Dependency Type**	**Dependent Attribute Group Name**	**Dependent Attribute Name**	**Parent Attribute Group Name**	**Parent Attribute Name**	**Parent Attribute Value**	**Table Column**	**Operator**
2	BRANDDEP	value	BrandSelection	attr_brands					
3					BrandSelection	attr_busunit		BusinessUnit	EQ
4					BrandSelection	attr_discount		Discounted	EQ

These dependencies create this behavior in the user interface:

a When a user selects an entry in the **Business Unit** menu, the corresponding list of brands is shown (which are values from the attr_busunit property).

b When a user checks or unchecks the **Discounted** check box (which is the attr_discounted property), the brands list is filtered.

This is an example of how these dependencies appear in the user interface:



Example: Value Dependencies for Cascading Lists

This example creates cascading lists for selecting a location. When a user selects a continent, the country list is filtered, and when a user selects a country, the list of cities is filtered.

1 Define the attributes. Assume that the following custom properties are defined in the Attributes worksheet (values in hidden columns are blank):

	A	B	C	D	F	G	I	J	N	P	Q	R	S
1	Attribute Group Name	Attribute Group Display Text	Attribute Group Description	Class	Attribute Name	Display Text	Data Type	UI Type	Required	Picklist Values Source	Obsolete	Ad Hoc	Dynamic
6	LocationSelection	Location Selection	Select the location associated with this item.	message, creative							FALSE		
7					attr_continent	Continent	Text	Dropdown list	FALSE	Table-Cities.Continent	FALSE	FALSE	FALSE
8					attr_cntry	Country	Text	Dropdown list	FALSE	Table-Cities.Country	FALSE	FALSE	FALSE
9					attr_cty	City	Text	Dropdown list	FALSE	Table-Cities.City	FALSE	FALSE	FALSE

The is an example of values that are defined in the Table-Cities worksheet.

	A	B	C
1	Continent	Country	City
2	Africa	Congo	Aba
3	Africa	Congo	Beni
4	Africa	Congo	Daein
5	Africa	Sudan	Khartoum
6	Asia	China	Beijing
7	Asia	China	Shanghai
8	Asia	India	Pune
9	Asia	India	Bangalore
10	Asia	India	Mumbai
11	Asia	Japan	Tokyo
12	Europe	United Kingdom	London

2 Set up the location dependencies to create a cascading filter. This example shows the values to set up these dependencies.

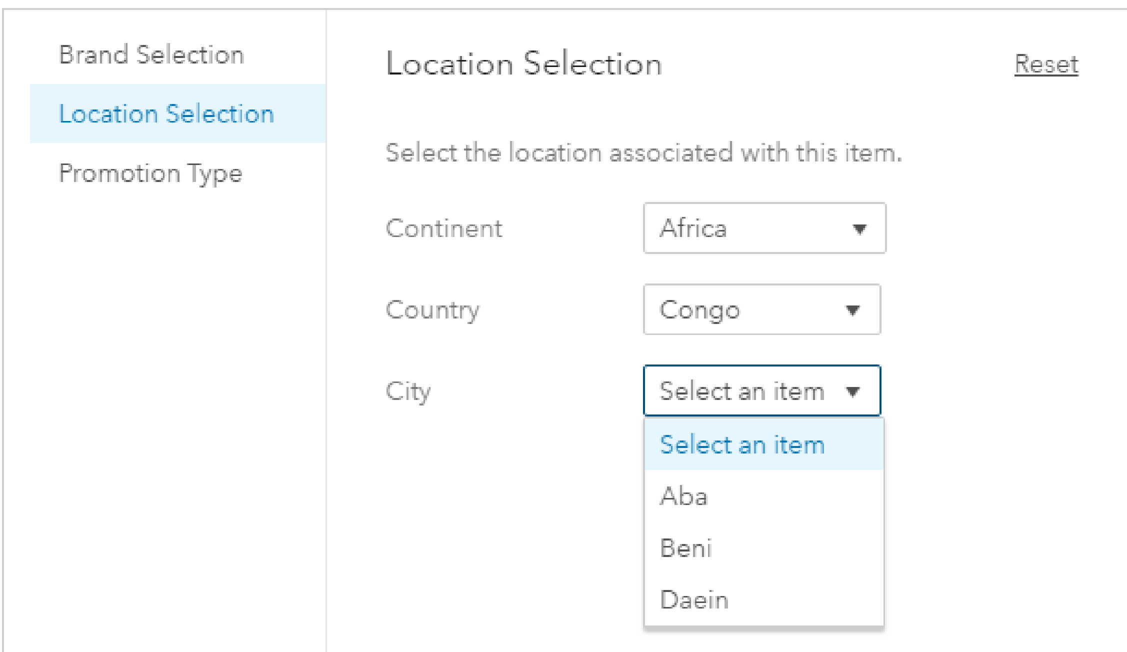
	A	B	C	D	E	F	G	H	I
1	Dependency Name	Dependency Type	Dependent Attribute Group Name	Dependent Attribute Name	Parent Attribute Group Name	Parent Attribute Name	Parent Attribute Value	Table Column	Operator
5	LOCDEP1	value	LocationSelection	attr_cntry					
6					LocationSelection	attr_continent		Continent	EQ
7	LOCDEP2	value	LocationSelection	attr_cty					
8					LocationSelection	attr_cntry		Country	EQ

These dependencies establish these cascading relationships in the user interface:

a attr_continent (a list of continents) is filtered based on the selection for attr_cntry (a list of countries)

b attr_cty (a list of cities) is filtered based on the selection for attr_cntry

This is an example of how the dependencies are displayed in the user interface:



Example: Visibility Dependency for a Picklist

This example creates a dependency to display a picklist of seasons only when a check box is selected.

1 Define the attributes. Assume that the following custom properties are defined in the Attributes worksheet (values in hidden columns are blank):

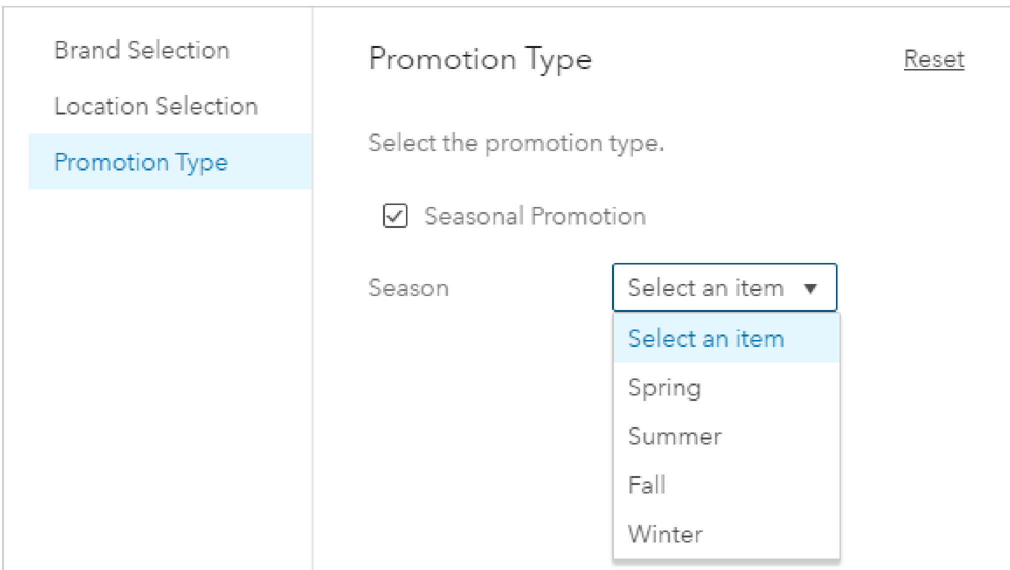
	A	B	C	D	F	G	I	J	N	P	Q	R	S
1	Attribute Group Name	Attribute Group Display Text	Attribute Group Description	Class	Attribute Name	Display Text	Data Type	UI Type	Required	Picklist Values Source	Obsolete	Ad Hoc	Dynamic
10	PromotionType	Promotion Type	Select the promotion type.	message, creative									
11					attr_season_chk	Seasonal Promotion	Boolean	Checkbox	FALSE		FALSE	FALSE	FALSE
12					attr_season	Season	Text	Dropdown list	FALSE	Picklists.season	FALSE	FALSE	FALSE

This example uses the picklist values from the previous picklist example.

2 Set up the dependency to show the picklist only when the check box is selected. This example shows the values to set up this dependency.

	A	B	C	D	E	F	G	H	I
1	**Dependency Name**	**Dependency Type**	**Dependent Attribute Group Name**	**Dependent Attribute Name**	**Parent Attribute Group Name**	**Parent Attribute Name**	**Parent Attribute Value**	**Table Column**	**Operator**
9	SEASONDEP	visibility	PromotionType	attr_season					
10					PromotionType	attr_season_chk	TRUE		

This is an example of how the dependency is displayed in the user interface:



Upload the Custom Properties Spreadsheet

To upload the custom properties spreadsheet:

1 From the navigation bar, navigate to **General Settings** ⇨ **Data Management** ⇨ **Data Sources**, and perform one of these steps:

- If there are existing data sources in the table, click .
- If no data sources exist, click **Upload Data**.

2 On the **Select Data Type** page, select **Custom Properties**.

3 On the **Select Associated File** page, browse and select a file to upload.

Note: The maximum file size is 10 MB.

4 Click **Upload Data**. As the file is being uploaded, a confirmation message is displayed.

17

Understanding Item Insights

Many items, such as spots and tasks, contain an **Insights** tab where you can define how to measure progress and then track performance.

Understanding Analytic Results

When you are reviewing the analytic data available for spots and tasks, it is helpful to understand some key concepts.

How Do I Know If My Content Is Performing Well?

When you create a task to deliver content, you typically have a goal in mind. Examples of those goals might be increasing the number of people who create accounts on your site, increasing product purchases, or increasing subscriptions to your blog or newsletter. The percentage of users who complete your goal is the *conversion rate*. The act of completing the goal is known as a *conversion*.

For example, you create a task with content that encourages people to subscribe to your blog. Out of 100 members of your target audience, 70 subscribe to the blog. Your conversion rate for the task equals 70%.

You can see conversion rates throughout SAS Customer Intelligence 360, including the tiles on the **Home** page and the **Insights** tab of tasks and spots. However, not all of the task types contain the same amount of analytic data.

Measuring Performance with Metrics

In order for the analytics to show data that reflects whether your goal was reached, you need to create a primary metric to reflect that goal. *Metrics* measure user actions that the system can detect, such as a person clicking a spot on a web page. Metrics measure the success of the content being delivered by a task.

SAS Customer Intelligence 360 has different categories of metrics. Not all metric types are available for all task types:

- A *primary metric* measures conversions to determine the success of the task. A task can contain only one primary metric.
- A *secondary metric* measures other benchmarks that you are interested in. You can add multiple secondary metrics to your tasks. For example, you might want to learn more information about the people who subscribe to your newsletter. You can create secondary metrics to capture this additional information.

  Note: Each secondary metric can have only one data view or event.

Note: In addition to primary and secondary metrics, there is a set of *e-commerce metrics* that is available only for web A/B test tasks and mobile spot A/B test tasks.

See Also

"Key Testing Concepts" on page 918

Settings That Impact Analytics

The analytic data available throughout SAS Customer Intelligence 360 is calculated using settings specified in **Analytic Settings** section of the **General Settings** page. Changes to these settings affect all users and items.

Note: Only administrators have access to **General Settings.**

For more information about these settings, see Chapter 10, "Analytics," on page 103.

PART 4

Managing Customer Data

18

GDPR Support

About GDPR Support in SAS Customer Intelligence 360

General Data Protection Regulation (GDPR) is a data privacy regulation that enables individuals to have more control over how organizations use their data.

Right to Access

The *right to access* is a regulation that enables individuals to request that an organization disclose any information they have on that individual.

SAS Customer Intelligence 360 provides export REST APIs to retrieve customer data and event data that has been collected about a specific customer. The data is exported as CSV files that can be downloaded by the person issuing the request through the REST API. The response from the export request returns an ID that can be used to retrieve the CSV files after processing is complete, typically in a few minutes.

See these topics for more information:

- “Exporting Customer Identity Data”
- “Exporting Customer Event Data”

Right to Be Forgotten

The *right to be forgotten* is a regulation that enables individuals to request that an organization delete any data about them.

SAS Customer Intelligence 360 provides the deleteList import descriptor that can be used with the existing REST API. This descriptor enables you to define the type of customer IDs that need to be deleted and then upload a corresponding list of IDs. After the IDs are imported and processed, SAS Customer Intelligence 360 deletes all customer data about the individual, as well as identity types and mappings to IDs that might not identify them (such as visitor IDs and device IDs). This deletion effectively orphans the identity ID and event data so that it cannot be matched to an individual.

For information about this feature, see “Deleting Customer Identity Data”.

Protecting Customer Data

In its initial proposal to reform data protection rules, the European Commission defined personal data as “any information relating to an individual, whether it relates to his or her private, professional or public life. It can be anything from a name, a home address, a photo, an email address, bank details, posts on social networking websites, medical information, or a computer's IP address." This information is typically referred to as personally identifiable information, or PII.

SAS Customer Intelligence 360 enables you to customize messages and create segments with PII and discard the data afterward. When you import PII with a data descriptor that uses the transient type, the system creates a temporary table to process the data and deletes it afterward, so sensitive information is not kept in the database. For more information, see "Using a Transient Table for Temporary PII Data".

For general information about GDPR and SAS, see General Data Protection Regulation on www.sas.com.

19

Managing Customer Identities

Overview of the Identity Service

About the Identity Service

Organizations can use the identity service for SAS Customer Intelligence 360 to communicate with customers through targeted marketing campaigns and advertisements that are relevant to customers' online presence.

The identity service is an integral part of the data hub for SAS Customer Intelligence 360. The service enables organizations to collect customers' online presence to construct a unique identity profile. Data for the identity profile can come from multiple channels (such as websites, email, and mobile apps) and external data that you import from other sources.

You can use the identity service to create new identities, remap data for existing identities, bridge (or merge) identities, prioritize identity assignment, retrieve identities, and define customer attributes.

Definitions

data hub
: the component of SAS Customer Intelligence 360 that unifies and manages online and offline streams of data at a customer level. The data hub consumes data from real-time processes or batch uploads through a suite of APIs, adapters, and data management functions.

identity
: a piece of information that identifies a customer. One customer can be associated with multiple identity types. Identity types are associated with each other to form a comprehensive profile of a customer.

attribute
: an optional data field that can be stored with an identity type. Attributes are customizable, business-specific information.

: The identity service accepts identity attributes through a mapping request from an identity event. These attributes can be retrieved when you request an identity type from the data hub service.

identity event
: an event in SAS Customer Intelligence 360 that generates data that can be used to create or modify a customer's identity profile. For example, an identity event could be a customer entering his email address in a field or signing in to a website.

mapping
: the process of associating identity types (for example, a visitor ID or a customer ID) with a data hub ID.

merging
: combining two or more existing customers into one customer profile.

unique identity
: identity data that is a high-quality indicator of uniqueness. In most cases, this identity can be traced to a single customer (for example, a customer ID).

non-unique identity
: identity data that is a low-quality indicator of uniqueness. The most frequently used non-unique identity is device ID or visitor ID.

  For example, if multiple users share the same machine, a visitor ID can be shared among people who can sign in to the machine. When a user signs in, this ID is mapped to the user's data hub ID.

  Similarly, mobile devices have a device ID. The device ID is associated with the user who signs in to that device.

identity priority
: the order of importance for how the identity service evaluates rules to assign identity types. Priority rules are defined in the sas.mkt.datahub.identity_types property on page 170.

Identity Types

These identity types are managed by the identity service:

data hub ID
: an identity that is created by the identity service. A customer is associated with only one primary data hub ID, and all customers represented in the data hub must have a data hub ID. Customers might have a secondary data hub ID that represents their usage when they were anonymous.

  This ID bridges all identities together for a specific customer. Any service that uses the identity service can pass any other identity for a customer and retrieve the customer's data hub ID.

secondary data hub ID
: a data hub ID that was initially assigned to a customer, but it is no longer the primary identifier.

  For example, assume that a customer uses a new computer (or clears the cookies) and visits a site. The identity service does not recognize the customer and assigns the customer a data hub ID.

  After the customer logs in, the identity service can recognize the customer's profile, so the new ID that was created is merged to the existing, primary, data hub ID. If another service requests the customer profile based on the secondary ID, then the identity service returns the primary ID instead.

The types can be imported with customer data and are defined in the data descriptor:

customer ID
: a value that is imported as a part of external customer data. For example, a customer ID might be an account number on your online store.

login ID
: a login ID that is captured from real-time data sources or imported from external customer data.

subject ID
: a subject identity that is imported from SAS Marketing Automation. A customer is associated with only one subject ID.

visitor ID
: an identity that is mapped to a customer based on the customer's visits to websites. A user is assigned a visitor ID when he or she visits your website.

  If a data hub ID already exists for this visitor ID, then their browsing behavior is mapped to the data hub ID. Otherwise, the data hub generates a new data hub ID. As more data becomes available, existing visitor IDs and data hub IDs might be merged. A customer can be associated with zero to many visitor identities.

device ID
: an identity that is mapped to a customer based on application usage from a mobile device. A customer can be associated with zero to many device identities.

Improving the Customer Experience

The features of the data hub's identity service enhance how you interact with your customers:

- You can integrate the identity service with SAS Marketing Automation and other components of SAS Customer Intelligence 360 to conduct marketing campaigns that are targeted to a desired set of customers. As a result of this targeted campaign, you gain a clearer understanding of customer behavior and more valuable feedback.
- Instead of sending general emails, you can use a transient descriptor on page 207 to use customers' personally identifiable information (PII) and personalize your emails based on their profiles. After the PII data is used for your task, SAS Customer Intelligence 360 discards this data so that it is not stored.
- You can retrieve customer information and communicate with customers across multiple channels (web, mobile, and email).
- You can customize your strategy for contacting customers based on their contact preferences. This customization enables you to send emails to the correct email address or avoid sending unwanted emails to customers who have opted out of communication.

Prioritizing Identities

Prioritization controls how the identity service evaluates, maps, and merges identities for a customer in SAS Customer Intelligence 360. Prioritization of identities is determined by the sas.mkt.datahub.identity_types property. This property defines the order of identity types based on which identity types you consider to be more important.

The sas.mkt.datahub.identity_types property is configured when SAS Customer Intelligence 360 is first being set up for your organization. If you need to update this property later, contact your SAS representative.

This is the default value for the sas.mkt.datahub.identity_types property:

```
sas.mkt.datahub.identity_types=
type=login_id:casesensitive=no:priority=1:unique=true,
type=customer_id:casesensitive=no:priority=2:unique=true,
type=subject_id:casesensitive=no:priority=3:unique=true,
type=device_id:priority=4:unique=false,
type=visitor_id:casesensitive=no:priority=5:unique=false,
type=ad_id:casesensitive=no:priority=6:unique=false,
type=datahub_id
```

Each identity type can have optional attributes. These are the attributes that can be defined:

Table 19.1 Attributes for the sas.mkt.datahub.identity_types Property

Name	Description
casesensitive	Specifies whether the casing of login IDs, customer IDs, and so on, is treated differently based on capitalization. The value can be `yes` or `no`. The default value is `no`. Note: If you change this property, be aware that existing identity values might not work as expected if they use mixed case. For best results, update the property and import your customer data and contact preference data afterward to replace the existing values.
unique	Specifies whether this identity type is a high or low indicator of a customer's unique identity. The value can be `true` or `false`.

If an identity type is not included in the sas.mkt.datahub.identity_types property, the type is given the lowest priority. Identity types can be added later if you want them prioritized.

Mapping and Merging Identity Types

Overview

When a customer triggers an identity event in SAS Customer Intelligence 360, the event data is sent to the data hub. The identity data from this event, which could be one or more pieces of identity information, is then mapped or merged to the customer's profile.

The identity service operates by these basic guidelines:

- A single data hub ID can contain zero or more identities of the same type. For example, if a visitor ID is being mapped to a data hub ID with an existing visitor ID, the result of the mapping is a data hub ID that has two visitor IDs mapped to it.
- An identity can be mapped to only one data hub ID at any time. For example, a visitor ID cannot be mapped to two different data hub IDs at the same time. However, the visitor ID can be remapped to a different data hub ID as the result of a map request.
- In some cases, identity data from a new event indicates that existing identity types should be merged. For example, anonymous identities are found to be associated with a known customer, or one or more individual customers in the data hub are discovered to be the same customer.

  When this determination is made, the identity service merges all of the identity types from the individual customer into one data hub identifier.

The Base Identity

The identity service uses base identities to determine the target identity into which other identities are mapped or merged. Ideally, the base identity is a unique, high-priority identity.

The base identity is chosen based on priority rules and the incoming identity data:

1. If an incoming identity request contains identity values that already exist, the existing identity that has the highest priority is chosen as the base identity.
2. If the base identity is a non-unique identity, the data hub analyzes other identities that are associated with the existing data to determine whether any identity exists that is unique or has a higher priority.
3. The data hub ID that has the highest priority and is the best indicator of uniqueness is assigned as the base identity.
4. After a base identity is detected, a sequence of mapping or merging rules specifies which identities are mapped and which identities are merged.

Rules for Incoming New Identities

If all of the incoming identity data is new to the data hub:

1. A new data hub ID is created.
2. The incoming identity types (such as login ID or customer ID) are mapped to the new data hub ID.

If the incoming identity data contains existing and new identities:

1. The base identity is selected from the existing identities based on your prioritization rules.

2 New identity data is then mapped to the data hub ID that corresponds to the base identity.

Creating Identity Definitions

Create new definition rules to map users of your site to stored identity data. To create a new rule:

1. From the navigation bar, click **General Settings** and select **Classification** ⇨ **User Identities**.
2. Click
3. Select the event type.
   - Select **Click** if you want to monitor a page element when it is clicked. The page element that a user clicks is known as the click target.
   - Select **Form Submit** if you want to specify form elements on a page to monitor.
   - Select **Page View** when you want to specify a specific page or pages that match a pattern that you define.

   Note: The **Advanced Event** option is no longer available. Existing advanced events still generate data for SAS 360 Discover, but they cannot be used in other licenses of SAS Customer Intelligence 360.
4. Select the page on your site to watch for this event.

   CAUTION! Define only one identity event for a page on a site. When more than one identity event exists for the same page on a site, there is no way to ensure which event is triggered. Also, be sure your site's pages follow the guidelines for preparing your site on page 15.
   - For a click event, navigate to the page that contains the click target. From the navigation bar, change the radio button to **Select** (from **Navigate**).

     Select the click target to highlight it. You can change this element later on the **Target Location** tab.
   - For a form submit event, navigate to the page that contains the form. From the navigation bar, change the radio button to **Select** (from **Navigate**).

     Select the form element to highlight it. You can change this page or form element later on the **Form Location** tab.
   - For page view events, select the page that you want to monitor.

     Note: You can change this page or page view event later on the **Page Location** tab.
5. Click **Create Definition**.
6. Select the identification type. The identification type is the category that best fits the user ID that you are capturing. All identity types are bridged together in the system to create unique customer profiles.

   Select one of these types:

Login
: a login ID that represents a customer. For example, this value could be the user name that the customer uses for your site. Customer profiles can be associated with more than one login ID.

  Note: For SAS 360 Discover, you must define the user identity as a login type to ensure it is written to the SESSION_FACT.LAST_USER_ID table and automatically used as the primary key for the ECV process.

Customer ID
: a unique ID for a customer on your site. For example, this value could be the customer's account number. Typically, a customer has only one customer ID, but customers can be associated with multiple customer identities.

7 Refine which pages to include in the event on the **Event Configuration** tab.

   a For form submit events, refine the elements that are used to identify the form in the **Form Identification** section.

   b In the **Pages Containing Form** or **Pages in Event** section (depending on your event type), specify the pages to monitor for this event.

   - To use only the page that you selected originally, select **Only page where selector was chosen** or **Selected page** (depending on your event type).
   - Select **Pages matching attribute pattern** to define rules that determine which pages to include.
   - Select **Any page** to include all pages.

8 Complete the fields on the **User ID Attribute** tab.

   a Define how to capture the identification data.

   - For form submit events, click for the **Field Name, ID** field and select the form field to use.

     For the **Return** field, select the appropriate value from the menu. You might need to complete additional information based on the option that you choose.

   - For click events and page view events, select an element that contains the information that you need.

     For the **Return value from** field, select a value based on the type of element:

     - For attributes, select the name of the attribute.
     - For field values, select **value**.
     - For the content of a node, select **innerHTML** or **innerText**, depending on the node type.
     - If you use a JavaScript object, you must specify *object.property* in the **Variable name** field. You cannot specify only the object.

   b For the **Obscured** option, select **Yes** or **No**. This option specifies whether values are obscured before they are saved.

   CAUTION! For best results, do not modify this setting after identities are created. If you change the obfuscation value after identities are created, the existing identities can be adversely impacted in the back-end database.

9 (Optional) Define an event to confirm a user's ID.

a Set the time period in which the user ID must be confirmed. The time can be in seconds or minutes. The default is one minute.

b Specify the page attributes that identify the confirmation event.

For example, assume that the body tag contains the text "isLoggedIn" for logged-in users. In the **Page Attributes** section, enter this text in the **Page element** field: `body:contains(isLoggedIn)`

Importing and Exporting Identity Data

Importing the Data Descriptor

To import external customer data into SAS Customer Intelligence 360, you must first create and import a data descriptor into the data hub.

A data descriptor describes the data to be imported:

- which column or columns contain the identity data
- the attributes that are associated with identity columns
- the customer's personal data
- specifications that make data available for targeting in segments

Loading Identities in Bulk

When you import a bulk collection of identity data into the data hub, the identity service maps all customer identities into the data hub at one time.

The identity service completes two actions:

1 Creates a new data hub ID.

2 Maps all identities for a customer to the data hub ID.

Note: This step is not performed when a piece of identity from the data import already exists in the data hub. In this case, the identity service follows mapping and merging rules to map any new identity data to the existing identities.

Sending Data for Targeting

After the identity service has mapped a customer's identity to the data hub, the identity service sends the customer data, along with the customer's data hub ID, to the intelligent advertising component of SAS Customer Intelligence 360.

Using Identity Data in Other SAS Solutions

You can import data into other SAS solutions that use the Customer Intelligence data model. After you import the data, you can run complex queries against your customer data and generate a segment of customers to target.

1. After you import a list of subject IDs (which represent a segment of customers) into the data hub, the identity service maps each subject ID to a data hub ID.
2. A designer can create segments from that identity data and create tasks that target this segment of customers.
3. After the segments are published in SAS Customer Intelligence 360:
   a. Segment criteria are published to the data hub.
   b. The data hub generates the segment and exports the segment information to the intelligent advertising component.
4. When the targeted customers visit the client’s website:
   a. Events are generated based on the customer activities.
   b. The data hub generates contact and response data from these events that SAS Marketing Automation can then analyze.
   c. Export the data to use it in other solutions.

Task Flow for Identity Processing

All calls to the data hub identity service are processed in real time, including mapping of identities to data hub IDs and merging of identities.

Anonymous Browsing

When a customer browses a website anonymously, this is the typical task flow in the identity service:

1. Anonymous events are sent to the data hub.
2. One of these steps happen, depending on whether the customer is a new visitor:
   - If the customer already has a visitor ID (which is stored in a browser cookie), the system retrieves their data hub ID.
   - If the customer does not have a visitor ID, a visitor ID and data hub ID are created. These two IDs are mapped together.
3. Events are associated with the anonymous user’s data hub ID.

Signed-In Customers

When customers signs in to a website, SAS Customer Intelligence 360 performs these steps:

Note: A login might use a login ID or customer ID, but assume it is a login ID for this explanation.

1 Before the customer signs in, a visitor ID (visitor1 for this example) and a data hub ID (dataHub1 for this example) are created for them based on their anonymous browsing.

2 When the customer signs in, this login ID (login1 for this example) is mapped to visitor1.

3 Customers who are repeat visitors to your site might already have a data hub ID in the system. So, one of the following steps happen based on what information already exists:

- If the customer's data hub ID (dataHub1) does not already have a login ID mapped to it:

1 Login1 is mapped to dataHub1.

2 All events are associated with dataHub1.

- If the customer's login ID (login1) is already mapped to an existing data hub ID (dataHub2), these steps happen:

1 Events that occurred before the customer signs in are associated with dataHub1.

2 Events that occur after the customer signs in are associated with dataHub2 (and also login1).

3 dataHub1 is re-categorized as a secondary data hub ID. This secondary ID is used as a reference (similar to a pointer) to dataHub1 (the primary data hub ID).

When the identity service merges the identities for dataHub1 and dataHub2, the changes propagate through the system in real time. If you were to export this customer's data, you could reference dataHub1 or dataHub2, and you would get the same export data with attributes from both.

Scenarios for Identity Processing

These scenarios describe how the identity service evaluates customer profiles and manages customers' experiences in SAS Customer Intelligence 360. In these examples, assume that the login IDs are not in the system and a new ID is created. However, in most cases, the login IDs already exist in the system. When the login ID exists, the data hub uses the existing data hub ID rather than creating a new one.

One User on Multiple Devices

1 A customer signs in to the website from her home computer.

  a The data hub does not recognize this customer.

  b The data hub maps a new customer login ID and a new visitor ID (the home computer) to a single data hub ID. The data hub's profile of this customer (the data hub ID) is associated with her login ID and her home computer.

  c When the customer signs in to the website from her home computer, her activities are associated with her data hub ID.

2 The next day, the customer signs in to the website from work.

  a The data hub recognizes the login ID, but it does not recognize the customer's work computer.

  b The data hub maps the new visitor ID (the work computer) to the data hub ID that already exists for the customer. The customer's profile in the data hub is now associated with her home computer and work computer.

  c When the customer signs in to the website from her work computer, her activities on the website are associated with her data hub ID.

3 The next week, the customer signs in to the website from her smartphone's web browser (for example, Safari or Chrome).

  a The data hub recognizes the login ID, but it does not recognize the device the customer is using.

  b The data hub maps a new visitor ID (the smartphone) to the data hub ID for the customer. The customer's profile in the data hub is associated with her home computer, her work computer, and her smartphone.

  c When the customer signs in to the website from her smartphone's web browser, her activities on the site are associated with her data hub ID.

4 The next week, the customer signs in to the mobile app from her smartphone.

  a The data hub recognizes the login ID, but it does not recognize the device the customer is using (which means that this is their first time using the app or signing in to the app).

  b The data hub maps a device ID (the smartphone) to the data hub ID for the customer. The customer's profile in the data hub is associated with her home computer, her work computer, her smartphone's web browser, and her smartphone's mobile app.

  c When the customer signs in to the mobile app from her smartphone, her activities in the mobile app are associated with her data hub ID.

Multiple Users on the Same Device

Three roommates share an apartment. There is one desktop available for use in the apartment.

1. Roommate #1 uses the desktop to sign in to a website.
   a. The data hub does not recognize the user or the desktop.
   b. The data hub maps a new visitor ID and a new customer login ID to a single data hub ID. The customer's profile in the data hub is associated with his login ID and the desktop computer.
   c. The customer's activities on the website are associated with his data hub ID.
2. Roommate #2 uses the desktop to visit a website but does not immediately sign in.
   a. The data hub recognizes the desktop and assumes that Roommate #1 is using the desktop.
   b. Roommate #2 signs in to the website after some browsing activity.
   c. The data hub recognizes the desktop but does not recognize the login ID.

      A login ID is a better indicator of a unique customer than a visitor ID (the desktop), so the data hub creates a new data hub ID and maps the login ID for Roommate #2 to the data hub ID. Because the visitor ID is considered a non-unique identity type in the data hub, the data hub maps the visitor ID to the data hub ID for Roommate #2.

      A visitor ID can be associated with only one data hub ID, so the visitor ID is no longer associated with the data hub ID for Roommate #1.
   d. All activities on the website after the login are associated with Roommate #2.
3. Roommate #3 uses the desktop to sign in to the website.
   a. The data hub recognizes both the login ID (from Roommate #3 signing in from somewhere else) and the desktop.
   b. The data hub maps the visitor ID to the data hub ID for Roommate #3. The visitor ID is no longer associated with the data hub ID for Roommate #2.
   c. All activities on the website are associated with Roommate #3.

Targeting a User Based on Behavior

A customer named Geoff logs in to the website for his favorite sports car from his smartphone at least five times a week. Geoff uses his email address as his login ID.

This month, the website has a campaign to offer a rare discount on a new model of sports car. The offer is advertised only to customers who meet these criteria:

- the age is between 40 and 50

- the annual income is greater than $250,000
- the customer visits the website at least two times a week

When Geoff signs in to the website, this is how SAS Customer Intelligence 360 and the identity service manage his experience:

1. The data hub recognizes Geoff's login ID and smartphone, and it associates his activity with his data hub ID.
2. In SAS Customer Intelligence 360, a designer creates a segment that uses the age and income criteria for the rare discount campaign.
3. The data hub generates the segment of customers that match the criteria, including the customers' data hub IDs, and sends this data to the intelligent advertising component of SAS Customer Intelligence 360.
4. The system recognizes that Geoff visits the website more than two times a week.
5. Although Geoff is 42 years old and has an annual salary of $320,000, the data hub does not have this demographic information for him.
6. Geoff is not shown the ad for the discount.

This experience can be improved by importing external demographic data into SAS Customer Intelligence 360:

1. You upload external customer data into the data hub. The data includes customer demographic information, including age and annual income. Geoff is a customer.
2. After the data is imported, Geoff's login ID is recognized by the data hub and his demographic information is associated with his data hub ID.
3. When the data hub regenerates the segment for the rare discount, Geoff is included in the segment.
4. The next time Geoff logs in to the website, he is shown the ad for the rare discount.

Using an Imported List

A large retailer uses SAS Marketing Automation to create a campaign with the goal to increase sales from females who visit its website.

1. The retailer uses SAS Marketing Automation to generate a list of female customers in the desired age range. The exported data contains the login IDs and subject IDs for each customer.
2. The data is imported into the data hub. The identity service creates an internal profile for each customer and maps the login IDs and subject IDs to each other.
3. In SAS Customer Intelligence 360, a designer creates a segment that contains the imported list of female customers. The segment criteria is published to the data hub.
4. The data hub generates the segment based on the published criteria. The segment contains IDs for the internal profile (which maps back to the original

login IDs and subject IDs), This segment is then sent to the intelligent advertising component of SAS Customer Intelligence 360.

5 When a female customer in the segment logs in to the site, she sees targeted ads with incentives to make purchases.

Anonymous Users

1 A user visits the online store for a shoe retailer for the first time. The user does not register with the online store.

   a SAS Customer Intelligence 360 generates a visitor ID for the user and sends it to the identity service.

   b The identity service does not have a data hub ID for the visitor ID.

   c The identity service maps the visitor ID to a new data hub ID and sends this data hub ID to other components of SAS Customer Intelligence 360. The data hub ID represents the anonymous user in the data hub.

2 The user views several pairs of shoes.

   a All user activities on the website generate events in the data hub, and the events are associated with the user's data hub ID.

   b The intelligent advertising component of SAS Customer Intelligence 360 collects page views and other metrics for the user.

3 Three days later, the user visits the website again to view more shoes.

   a A visitor ID already exists in the user's cookies, so SAS Customer Intelligence 360 retrieves the existing visitor ID and sends it to the identity service.

   b The identity service recognizes that the visitor ID is mapped to a data hub ID and returns that data hub ID to the other components of SAS Customer Intelligence 360.

   c Any user activities generate more events and metrics, and this data is associated with the existing data hub ID.

4 The user visits the online store for a third time. During this visit, the user registers with the online store to make a purchase.

   a The user is no longer an anonymous user.

   b When the user creates an account, the user's login credentials (login ID or customer ID) are mapped to the data hub ID that is already in the data hub.

   c Because the visitor ID is not associated any previous login ID, the event data for the user is merged with the existing data hub ID.

Merging Identities

1 You import customer data into the data hub.

   a The data includes a customer named Jose Silva with the login ID jose.silva@sample.com.

   b The identity service maps Jose's login ID to a new data hub ID (DHID1).

2 The user registers with a website using jose.silva@sample.com.

   a When the identity service starts to map the login ID jose.silva@sample.com to the visitor ID 227, the service recognizes that both pieces of identity are already present in the data hub.

      However, the identity pieces currently represent two different users:

      - The login ID is associated with DHID1.
      - The visitor ID is associated with DHID2.

      This map request indicates these two users are actually the same person.

   b For this scenario, assume that you set login identity as a unique identity and visitor identity as a non-unique identity. Therefore, the login identity has a higher priority and is used as the base identity instead of the visitor identity.

   c The identity service merges all identities associated with DHID2 into DHID1.

   d The identity service makes DHID2 a secondary data hub ID that references DHID1.

3 DHID1 is now associated with the login ID jose.silva@sample.com and the visitor ID 227.

4 When the identity service sends the merge information to the intelligent advertising component, all event records and metrics are merged into the DHID1 identity.

Identity Attributes for Personal Responses

1 Rin Ingeneri is a customer in the data hub with the following information:

   - ringeneri@play.com is the email address associated with her data hub ID (DHID5).
   - There are no contact preferences (such as opt-out) associated with this email address.

2 You import customer data that includes contact preferences for customer IDs.

   - The data import maps a second email address, Rin.Ingeneri@work.com, to DHID5.
   - The new email address has contact preferences associated with it. The identity is set to opt out of contact by email.

3 Rin visits a website and submits a form on a web page. This action triggers an email to be sent to her.

   a The email component of SAS Customer Intelligence 360 sends a request to the identity service to retrieve all identities for DHID5.

   b The identity service sends every email address (and its contact preference attribute) for that data hub ID to the email component.

   c An email is sent to ringeneri@play.com, because there is no opt-out information set for that address.

20

Importing Data

Creating an Import Descriptor

About Data Descriptors

Before you can import data, you need to define the basic layout of the data and its contents in a data descriptor. *Data descriptors* are JSON objects that describe the structure and the type of data items that are contained in a data set. An import descriptor is a data descriptor that is used only to describe data that is imported. When you upload data into SAS Customer Intelligence 360, you choose an import descriptor that already exists in the system.

Import descriptors contain these parts:

- top-level attributes. These attributes apply to the entire descriptor. They define basic information (such as name and description) and specific implementation settings (such as targeting availability).
- dataItems object. This is a JSON object that contains a list of one or more data items. In an import descriptor, data items are definitions of each field (column) that exists in your data set. Each data item can have its own set of attributes that define how the item is used by the system.

For example, assume you have a data set with three columns of information: login, name, and email. The import descriptor would have a dataItems object with three defined items:

```
{
  "name": "customer_tables",
  "description": "Sample import descriptor for customer tables",
  "type": "customer",
  "dataItems": [
    {
      "name": "login ID",
      "label": "Login",
      "description": "Customer login ID",
      "type": "STRING",
      "tags": [],
      "excludeFromAnalytics": true,
      "identityType": "login_id",
      "identity": true,
      "segmentation": true
    },
    {
      "name": "name",
      "label": "name",
      "description": "Customer name",
      "type": "STRING",
      "tags": ["DEMOGRAPHICS"],
      "excludeFromAnalytics": true,
      "channelContactInformation": true,
      "segmentation": true
    },
    {
      "name": "email",
      "label": "email",
      "description": "Customer email",
      "type": "STRING",
      "tags": ["DEMOGRAPHICS", "EMAIL_CONTACT"],
      "excludeFromAnalytics": true,
      "channelContactInformation": true,
      "segmentation": true
    }
  ]
}
```

For examples of data descriptors and corresponding data samples, see “Sample Data Descriptors and Data” on page 213.

Create the Import Descriptor

To create an import descriptor:

1 Open a text editor and create a basic template for your descriptor. You can use text similar to this example:

```
{
  "name": "",
  "description": "",
  "type": "",
  "dataItems": [
    {
      "name": "",
      "label": "",
      "description": "",
      "type": "",
      "tags": []
    },
    {
      "name": "",
      "label": "",
      "description": "",
      "type": "",
      "tags": []
    }
  ]
}
```

2 Define the top-level attributes. For more information, see “Import Descriptor Attributes”.

3 Define a data item for each column of your input data. For more information, see “Data Item Attributes”.

4 (Optional) Modify attributes to use merge tags with imported data. Merge tags enable you to personalize messages and creatives for specific members of the audience. You can use merge tags to dynamically retrieve personalized information about your recipient (such as his or her first name). This information can then be used to customize the content of a task.

To make your imported data available to merge tags, set these properties in the data descriptor:

a Add the EMAIL_CONTACT field tag to a data item that contains email addresses.

b Set the channelContactInformation attribute to `true` for the data item.

> **TIP** If you have data that could be used for merge tags but are unsure, add the channelContactInformation property just in case you do decide to use the data later.

5 (Optional) Modify attributes for segmentation. Set these attributes to control how SAS Customer Intelligence 360 uses your data in segment discovery, segment creation, and targeting:

a Set the type attribute for the data descriptor object (the top-level element) to **`customer`**.

b For best results, set these values for each dataItems property in the data descriptor:

Table 20.1 Property Settings for Segmentation

Property	Recommended Value	Description
segmentation	true	Enables an item to be used as criteria when you define a segment in the UI.
excludeFromAnalytics	false	If the value is **`true`**, then analytics cannot view the property. So, the user record cannot be part of a discovered segment criteria or segment profiles. Segment profiling still runs using that criteria to define the segment and the population, but that record is not part of the resulting analysis.
segmentProfilingField	true	Enables the system to use this record for segment profiling.

To illustrate how these settings interoperate and affect your data, assume that you have dataItems properties for "gender" configured as follows:

- `"segmentation": true`
- `"excludeFromAnalytics": true`

If you use the condition "gender=F" to define a segment, then analytics uses that criteria to split the data in half (in the segment and in the population). However, gender is not profiled by analytics and gender does not appear in any discovered segments. If the segmentation property is set to **`false`**, then analytics does not process it regardless of the value of the excludeFromAnalytics property.

This granular design enables you to explicitly define segments that were discovered by analytics in a task. If the segmentation property is set to **`false`**, then you cannot define that segment. This means that analytics is discovering segments that you cannot use for future targeting.

6 Upload the import descriptor. Use this REST call:

```
POST https://design-<server>/SASWebMarketingMid/rest/descriptors/
```

In the body of the REST call, paste the JSON code for the import descriptor.

Follow these guidelines when you submit a REST call:

- When you include JSON data in the body, set the Content-Type header value to `application/json`. How you set this value depends on the REST client.
- You must be authenticated with SAS Customer Intelligence 360. In most cases you can submit authentication information through your REST client.

If you receive an OK (response code 200) as a response, the upload was successful. If you need to update a descriptor, see “Update an Import Descriptor”.

Import Descriptor Attributes

A data descriptor consists of the following attribute and value pairs:

Table 20.2 *Import Descriptor Structure*

Name	Type	Description
name	String	The name of the descriptor. The name must follow these guidelines (except when the type is importedList): ■ Names must be less than 31 characters. ■ The first character must be a letter (case insensitive). ■ The name can contain only letters, numbers, and underscores.
description	String	(Optional) Specifies the purpose of the table.

Name	Type	Description
type	String	The dataType value. The system uses these predefined values for type: contact_preference used to upload email contact preferences in bulk. This type is used for opt-out preferences and situations where an email message is returned because the recipient's address is invalid. Note: This descriptor type is internal only. customer used for uploading customer data. The imported data is processed for identities (regardless of the presence of identity data items). As a result, the data can be used for analytics and segmentation. For an example descriptor and data, see “Sample Customer Identities” on page 213. This value is also used as the default if you specify a type that is not valid. deleteList used for removing customer identities from the data collection. A deleteList descriptor is similar to the customer type of descriptor, except the identities you upload are removed from your data (if they exist) instead of added. For more information, see “Deleting Customer Identity Data”. importedList used for imports of predefined segments such as linkable cells in the SAS Customer Intelligence 6.*x* data model. Follow these guidelines when you are using this type of data descriptor: ■ The data descriptor for an imported list can have only one data item. The data that you import with this descriptor should contain only one column of user data. When an imported list is generated from SAS Marketing Automation, the data column that you import is typically the subject ID. ■ The label that is displayed in the user interface comes from the label attribute in the customProperties data item. If a customProperties section does not exist for a data item, or the label attribute is not defined, then there is no entry for the imported list in the user interface. For an example descriptor and sample data, see “Sample Imported Lists” on page 216. lookup used for uploading beacon data and geofence data.

Name	Type	Description
type (continued)	String	The system uses these predefined values for type (this list is continued from the previous row): transient a variation of the customer data type that is used for temporary storage of personal identifiable information (PII) while a task uses the segment data. For more information about this type (including related settings), see “Using a Transient Table for Temporary PII Data” on page 207. Note: Define only one identity data item when you create an import descriptor for transient data. transientDeviceIdList a transient list type that is used for device IDs (which are usually mobile devices). This descriptor type is used to target a list of devices based on their device ID. You do not need existing customer data that is related to these devices. For more information about this type (including related settings), see “Using a Transient Table for Temporary PII Data” on page 207. Note: Define only one identity data item when you create an import descriptor for transient data.
makeAvailableFor Targeting	Boolean	(Optional) Specifies whether data items in this descriptor can be used directly in task targeting and merge tags, without adding the data to a segment. Typically, this attribute is used on imported lists because the data is already a known set of customers. Note: When makeAvailableForTargeting is `true`, be aware of these details: ■ The availableForTargeting attribute for data items is set to `true` for all data items in the descriptor. availableForTargeting is ignored if it is set for individual data items. ■ For data items, the name attribute must be set to `primary_offer` or `secondary_offers`. Data items with other values cannot be associated with published tasks. ■ For data items, the type attribute must be set to `STRING`.

Name	Type	Description
dataItems	Object	A collection of one or more data items. For the list of attributes for data items, see “Data Item Attributes”. Note: Imported lists can have only one data item, and the data item must be an identity.

customProperties	Object	(Optional) Specifies a collection of objects that can be used to store extra data. Custom properties are useful when you have data that does not fit in other parts of the data descriptor.
		
		The format of the customProperties object is a JSON key/value pair. Here is an example:
		
		`"customProperties":`
		`  {`
		`    "Status":"Active",`
		`    "Source":"SAS Marketing Automation"`
		`  }`

Data Item Attributes

A data item uses the following structure:

Table 20.3 Data Item Structure

Name	Type	Description
name	String	The name of the data item (column). Data item names must follow these restrictions: ■ Names must be less than 32 characters. ■ Names must start with a letter. For the rest of the name, you can use only alphanumeric characters and underscores. ■ Do not use reserved keywords (such as TIMESTAMP, INT, BOOLEAN, and so on). ■ For customer data, names must be unique (regardless of case) across all customer tables. The exception is names that are used as identities. Names for identity data items can be reused across tables. Note: For imported lists, if a name is not defined for the identity data item, the identityType attribute (such as subject_id) is used for the name.

<table>
<tr><th>Name</th><th>Type</th><th>Description</th></tr>
<tr><td>label</td><td>String</td><td>The text to be displayed in the user interface when a user selects the data item.

Label values must be unique for all types except imported lists. The system checks the uniqueness of fields and generates an error message if a new item uses a label that already exists.

Note: Do not use reserved keywords (such as TIMESTAMP, INT, BOOLEAN, and so on).</td></tr>
<tr><td>description</td><td>String</td><td>Describes the purpose of the data item.</td></tr>
<tr><td>type</td><td>String</td><td>Type must be one of these strings:
■ INT
■ DOUBLE
■ STRING
■ BOOLEAN
■ TIMESTAMP
Use this format: <code>YYYY-MM-DD HH24:MI:SS</code>
■ SMALLINT

Note: The correct value must be set for certain types of data:
■ Identity columns must use STRING as the type.
■ Predefined values in the descriptor (for example, values for a list) must use STRING or BOOLEAN to be visible in the user interface.</td></tr>
<tr><td>delimiter</td><td>String</td><td>The delimiter that separates values in this data item.</td></tr>
<tr><td>identity</td><td>Boolean</td><td>Specifies if the data item contains identity information.

Note: If the value for identity is set to <code>true</code>, then the identityType attribute is required. Otherwise, identityType is optional and ignored.</td></tr>
</table>

Name	Type	Description
identityType	String	(Optional) If the value for the identity attribute is set to **true**, then identityType must be set to one of these strings: ■ customer_id ■ device_id ■ identity_id When you import data with an identity ID, no identity processing is done. Imported data is associated directly with existing customer records. For an example, see "Sample Data Descriptor Using Identity IDs". Note: To use this identityType value, the import descriptor's type must be **customer**. ■ login_id ■ subject_id ■ visitor_id
identityAttribute	Boolean	(Optional) Specifies that the data item is PII information for a customer. This property is typically used when the import descriptor is used to import contact preference information for an identity type (such as channel preference, contact preference, or email preference).
key	Boolean	(Optional) Specifies that this data item provides a unique value for the data set. Items with the key value set to **true** are compared when you upload data with the upsert mode. For more information, see "Importing Data" on page 198. You can set the value to **true** for one or more columns. When the value is set for more than one column, the combination of those columns produces a unique composite key. The default value is **false**.
segmentation	Boolean	(Optional) Specifies whether the data item can be used to build a segment in the user interface. A segment represents a group of people who share common characteristics, such as age or gender, and can be used for task targeting. Note: Be aware of these restrictions when you set this property: ■ If segmentation is set to **true**, then there must be at least one data item with the identity attribute set to **true**. ■ If excludeFromAnalytics is set to **false** (that is, analytics is aware of this data), you cannot change the segmentation value from **true** to **false** after it is set.

Name	Type	Description
segmentProfilingField	Boolean	(Optional) Specifies whether the data item should be ignored in segment profiling. Note: This value must be set to `true` for data to appear on a segment's **User-Defined Criteria** tab.
uniqueValuesAvailable	Boolean	(Optional) Specifies that the data item provides a list of distinct values for the user interface. Note: When you add new values, the list might not be available immediately in the user interface. The list of unique values is generated during a server process that runs once a day.
predefinedValues	Object	(Optional) Specifies the unique values that are available when the isUniqueValuesAvailable property is `true`. Note: If the uniqueValuesAvailable property is `false`, then predefinedValues should be empty or absent. The value for predefinedValues attribute is a list, such as: `"predefinedValues":["value1","value2"]`
tags	String	(Optional) One or more constants that the user interface uses to determine the purpose of the data item. For a list of field tags, see "Field Tags for Data Items". The value for tags is a list, such as: `"tags":["TAG1","TAG2"]`
excludeFromAnalytics	Boolean	(Optional) Specifies whether the data item should be ignored by analytics. The default value is `true`.
availableForTargeting	Boolean	(Optional) Specifies that the data item can be used for targeting without being part of a segment. This property has the following restrictions: ■ You cannot change the value from `true` to `false` if you update the descriptor. ■ availableForTargeting is ignored on data items if makeAvailableForTargeting is set to `true` at the data descriptor level.

Name	Type	Description
channelContactInformation	Boolean	(Optional) Specifies that the data item is used in merge tags to personalize content for customers. If the property is not specified, it is set to `false` by default. Follow these guidelines when you use this property: ■ You cannot set the channelContactInformation attribute on an identity column. ■ You cannot change the value from `true` to `false` if you update the descriptor. ■ If you imported customer data before the channelContactInformation attribute was added, you must import the customer data again with a descriptor that includes this attribute.

customProperties	Object	(Optional) Specifies a collection of objects that can be used to store extra data. Custom properties are useful when you have data that does not fit in other parts of the data descriptor.
		The value for customProperties is a JSON key/value pair. Here is an example:
		`"customProperties":`
		`  {`
		`    "Status":"Active",`
		`    "Source":"TestSource"`
		`  }`
		Note: The name or value for a custom property should not exceed 250 characters.

Field Tags for Data Items

In a data descriptor, a field tag is a constant string that specifies the purpose of a data item. SAS Customer Intelligence 360 uses the tags to filter data for the relevant components in the user interface. These are the field tags that are available:

Table 20.4 Field Tags for Data Items

Name	Description
DEMOGRAPHICS	Fields that contain customer information that is used in segmentation. This tag enables data to appear in the user interface (and specifically the segment builder). When you use this tag, you must set the segmentation flag to `true` on the data item. Note: This segmentation flag is ignored for transient tables.

Name	Description
EMAIL_CONTACT	Data items that contain email addresses. This field tag is used to provide the value for the %%email_contact%% merge tag when you create a task. Note: Only one data item can be tagged with "EMAIL_CONTACT" across all customer descriptors and identity descriptors. Transient and lookup tables are allowed to have a data item with tag “EMAIL_CONTACT”, even if one already exists in another customer table.
IMPORTEDLIST	Data items that come from an imported list. Imported lists are typically lists of individuals from which a segment can be built. When you use this field tag, the data descriptor must use a type attribute set to **importedList**.
OFFERS	Specifies that the data item is used for targeted offers. If a data item is tagged with OFFERS, you must follow these guidelines: ■ The data item’s name must be either **PRIMARY_OFFER** or **SECONDARY_OFFERS**. ■ The data item can be used only in customer data tables.

Update an Import Descriptor

Update an existing data descriptor to change the value for data items that are already a part of SAS Customer Intelligence 360. The updates to the descriptor cascade to any data that is associated with the descriptor. You can update a data descriptor only through the REST API.

Complete these steps:

1 Find the ID (the **id** value) for the data descriptor that you want to update:

```
GET https://design-<server>/SASWebMarketingMid/rest/descriptors/<import_descriptor_ID>
```

> **TIP** If you know the name of your descriptor, you can retrieve it with this REST call:
>
> ```
> GET https://design-<server>/SASWebMarketingMid/rest/
>    descriptors?name=<descriptor_name>
> ```

If you do not know the ID or name, you can review the list of descriptors:

```
GET https://design-<server>/SASWebMarketingMid/rest/descriptors
```

2 Copy the descriptor’s contents from the JSON response to the GET call.

3 Edit the data items that you want to update. You can change these data items in a descriptor:

- channelContactInformation

- customProperties
- description
- delimiter
- identityAttribute
- key
- label
- predefinedValues
- segmentation

  Note: If excludeFromAnalytics is set to **`false`** (that is, analytics is aware of this data), you cannot change the segmentation value from **`true`** to **`false`** after it is set.
- segmentProfilingField
- tags
- uniqueValuesAvailable

4 Use a POST call to update the descriptor.

  a Use the PATCH method in the POST call's URL:

  ```
  POST
     https://design-<server>/SASWebMarketingMid/rest/descriptors/
     <import_descriptor_ID>?_method=PATCH
  ```

  Note: Be sure to include the underscore (_) in the URL.

  b Include the updated descriptor as the JSON body for the POST call.

  Note: If you attempt to update a field that cannot be changed, the request to change that field is silently ignored.

5 (Optional) Verify your updates by reviewing the contents of the descriptor. Use a GET call with the descriptor's ID:

  ```
  GET https://design-<server>/SASWebMarketingMid/rest/descriptors/<import_descriptor_ID>
  ```

Importing Data

After you have a data descriptor in the system, use that descriptor to import customer data and location (geofence or beacon) data. This data can be used in other parts of SAS Customer Intelligence 360 for targeting, defining segments, and so on.

Prerequisite

Before you can upload data, ensure that you have performed these tasks:

- Define your data descriptors. If you need to create a data descriptor, see "Creating an Import Descriptor" on page 185.
- Remove any duplicate customer records from your data tables. Customer records must be unique for each identifiable person.
- Select a file type and structure that matches the data descriptor:
  - The file must use UTF-8 encoding.
  - Only CSV files are currently supported.

Importing Data through the User Interface

From the navigation bar, click **General Settings** and select **Data Management** ⇨ **Data Sources**. For more information, see "Data Sources" on page 23.

Importing Data through the REST API

To connect to the REST API, use a REST client such as REST Client (for Firefox) or Insomnia REST Client (a stand-alone client).

Get the Data Descriptor

The REST call to create a data descriptor returns an ID that can be used to access the descriptor in other calls.

Use this REST call to get the data descriptor:

```
GET https://design-<server>/SASWebMarketingMid/rest/descriptors/
```

Follow these guidelines when you submit a REST call:

- When you include JSON data in the body, set the Content-Type header value to **`application/json`**. How you set this value depends on the REST client.
- You must be authenticated with SAS Customer Intelligence 360. In most cases you can submit authentication information through your REST client.

The REST call returns a response that is similar to this example:


```
{
    "links": [links removed from example. You can use the
              links to navigate through resource collections.],
    "name": "descriptors",
    "accept": "application/vnd.sas.marketing.data.descriptor.summary
               application/vnd.sas.marketing.data.descriptor
               application/vnd.sas.collection application/json text/plain",
    "start": 0,
    "count": 3,
    "items": [
        {
            "name": "customer",
            "id": "7f995e66-4474-4b9b-b37a-c64796c09bab",
        },
        {
```

```
                "name": "geofence_location",
                "id": "dc8947e9-ed62-4b0c-b7bd-f82c52e310f9",
            },
            {
                "name": "contact_preference",
                "id": "7ba72601-24bc-4d61-b325-c8127f760234",
            }
        ],
        "limit": 3,
        "version": 2
}
```


In the sample response, the customer table has a data descriptor ID of **`7f995e66-4474-4b9b-b37a-c64796c09bab`**. This value is used to retrieve the location where you upload the data file.

Get a Transfer Location

Use a POST call to get a temporary URL to upload the file.

Note: Temporary URLs can be accessed for about 15 minutes before they time out. You can use temporary URLs more than once, but you can always request a new URL if you do not start your upload in the 15-minute window.

```
POST
   https://design-<server>/SASWebMarketingMid/rest/fileTransferLocation/
```

The response should be similar to this example. (Line breaks in the URL string are for readability only.)


```
{
  "signedURL":
     "https://<host>.s3.amazonaws.com/transfers/5/fc80e6ed904e4a988
     1625b34481535c2?x-amz-security-token=<token>&AWSAccessKeyId=<access_key>&
     Signature=n9mYRyF%2Fc47Czni4bdvnnsmushI%3D"
  "httpMethod": "POST",
  "createdTimeStamp": "2016-03-08T13:47:03Z",
  "expiresTimeStamp": "2016-03-08T14:02:03Z"
}
```


Upload the File with Customer Data

Upload the file with curl with the temporary URL that was generated:

```
curl -v --upload-file myfile.csv
    "https://<temporary_URL>"
```

For more information about curl, see https://curl.haxx.se/.

Note: Before you upload customer data, make note of these guidelines:

- Only CSV files are supported.
- As a best practice, ensure that the data for a single customer is in one row only. For example, do not include the same customer on multiple rows with different login IDs.

Initialize the Import Process

After the data file is uploaded, use this REST call to create an import request:

```
POST
   https://design-<server>/SASWebMarketingMid/rest/descriptors/<import_descriptor_ID>/imports
```

In the body of the request, add JSON data to describe the upload. Here is an example import request:

```
{
   "fileLocation":
     "https://<temporary_URL>"
   "fieldDelimiter": ",",
   "contentName": "Customer Data as of May 2015",
   "fileType": "CSV",
   "recordLimit": 0,
   "headerRowIncluded": true
}
```

The data columns in the CSV file must be in the same order that is specified in the data descriptor. Use a comma to separate the columns.

The JSON data uses the attributes in the following table:

Table 20.5 JSON Body of POST Call to Import Data

Name	Type	Description
fileLocation	String	The temporary URL that is generated when you request the transfer location.
fieldDelimiter	String	The delimiter that separates columns in the data file. Note: Only commas (,) are currently supported.
fileType	String	The file type of the data. Note: Only CSV files are currently supported.
recordLimit	int	(Optional) Specifies the number of records to import. If the value is empty or set to `0`, then all of the records are imported.

Name	Type	Description
updateMode	String	(Optional) The mode in which the imported data is processed. The mode can be one of these: ■ **replace**: This mode replaces all the data from previous uploads to this descriptor. ■ **append**: This mode appends data from the imported file to the customer records that already exist for this data descriptor. ■ **upsert**: This mode updates any existing records and appends new records. The upsert mode updates values based on checking data items that have the key parameter set. For more information, see the key attribute in see “Data Item Attributes” on page 192.
headerRowIncluded	Boolean	Set to **true** if the first row contains header information instead of a data record. Note: Even if you include a header row, the column is not read to determine the placement of columns. The data must be in the same order as the fields in the descriptor.

After you send the import request, the REST API returns an import request ID that you can use to check the status of that request.

View the Status of an Import Request

After you submit an import request, you can check the status of the import process through the user interface or with the REST API. To view the status in the user interface, see “View Status of Import Jobs”.

To view the status of an import request by using the REST API:

1 (Optional) If you do not have the ID for the import request from initializing the import request, you need to retrieve it.

   a To list all the import requests that are associated with a data descriptor, use this REST call:

   ```
   GET https://design-<server>/SASWebMarketingMid/rest/
     descriptors/<import_descriptor_ID>/imports
   ```

   The import descriptor ID is the descriptor that you used to start the import process.

   b Review the return values to find the **id** value for the import request that you submitted.

2 Retrieve the import request. Use this REST call with the import request’s ID:

   ```
   GET https://design-<server>/SASWebMarketingMid/rest/
     descriptors/<import_descriptor_ID>/imports/<import_request_ID>
   ```

   The response is similar to this example:

```
{
    "version": 1,
    "status": "IMPORTED",
    "recordLimit": 0,
    "updateMode": "append",
    "headerRowIncluded": true,
    "id": "624308dc-95e8-4419-9a0c-e5832e2a4284",
    "name": "Customer Data Definition",
    "dataDescriptorId": "a4b297b4-eccb-41cf-92c1-2b243706bfa8",
    "fieldDelimiter": ",",
    "fileLocation": "s3://<file_location>/data/tenants/<tenant_ID>/tmp/
      deb06c2d-f255-4656-b9f3-6df9bad1b7ba",
    "dataTableId": "81e82375-5ff5-480a-913c-f11b3edd43c5",
    "fileType": "CSV",
    "links": [
        {
            "method": "GET",
            "rel": "self",
            "href": "https://design-<server>/SASWebMarketingMid/rest/descriptors/
              a4b297b4-eccb-41cf-92c1-2b243706bfa8/imports/
              a4b297b4-eccb-41cf-92c1-2b243706bfa8",
            "uri": "/imports/a4b297b4-eccb-41cf-92c1-2b243706bfa8",
            "type": "application/vnd.sas.marketing.data.import.request"
        }
    ],
    "jobID": "7aae22bf-7b24-47ab-86e9-2f1c387088a9",
    "jobStepID": "1b22d7fc-843a-4290-aea3-4b3012618a56",
    "contentName": "Customer Data Definition"
}
```


This information is displayed about each import job:

Table 20.6 Details about Import Job

Name	Description
Import Details	The import request ID, the data descriptor ID, and the table name that was imported.
Import Validation	The validation status. When the data is validated, this field displays the date and time at which validation completed.
Data Processing	The status of data processing. When processing is complete, this field displays this information: ▪ the date and time at which processing completed ▪ the total number of records that were uploaded

Name	Description
Identity Processing	Detailed information about how identity information was processed. The date and time of completion is also displayed. These categories are displayed: Total Number of Records Processed The number of identity records that were processed. Total Number of Records Not Processed The total number of records that could not be processed successfully. Error messages include information about the column that caused the problem, invalid characters in a field value, names of missing columns, and data type mismatches. Total Number of Identities Rejected The number of identity records that were rejected. These records were processed successfully but were not converted to identity IDs in the data hub. Total Number of Identities Created The number of identities (with corresponding IDs) that are created as a result of the data import. This number includes only identities that are from records that are successfully processed. Total Number of Identities Updated The number of identity IDs that are updated as a result of the data import. Updated identity IDs are existing IDs that are updated because of a mapping or merge of an identity type into the ID. This number includes only IDs that are updated from rows that are successfully processed. Total Number of Identities Deleted If the import data descriptor was a deleteList type, then this field displays the number of identities that were deleted successfully. If there are import failures, use the REST API to download a CSV with the failed rows.
Input File Processing	The percentage of the input file that has been processed.

Name	Description
Overall Import Status	The overall status of the import request. When the import is complete, this field displays the date and time at which the job finished. These are the possible statuses in their sequential order: CREATED The import request has been successfully created. VALIDATING Import resources are being validated. These statuses can follow the VALIDATING status: VALIDATED The imported resources are successfully validated. FAILED_VALIDATION One or more resources failed validation. Data processing is stopped. PROCESSING The import request is being processed, and that data is being loaded into the data warehouse. These statuses can follow the PROCESSING status: COMPLETE Data is successfully loaded into the data warehouse. IMPORTED Data was successfully imported. This status is displayed at this point only when the input data does not contain identity data. FAILED Data could not be loaded into the data warehouse successfully. Data processing is stopped. PROCESSING_IDENTITIES Identity data is being processed. These statuses can follow the PROCESSING_IDENTITIES status: SYNCING_IDENTITIES Identity data is being synchronized with data in the data warehouse. COMPLETED_IDENTITIES Identity processing is complete. FAILED_IDENTITIES Processing failed when the system was processing identity data. IMPORTED Data was successfully imported. The data is ready to be used.

Download Failed Imports from the REST API

When there are records that failed to process, the system creates a CSV file that contains the failed entries. To download the failed entries:

1 Get the status of the import request with this REST call:

```
GET https://design-<server>/SASWebMarketingMid/rest/
  descriptors/<import_descriptor_ID>/imports/<import_request_ID>
```

If you do not have the import descriptor ID or the import request ID, see “View the Status of an Import Request”.

2 In the JSON response, find the failureOutputFiles object. The “url” attribute of this object contains a link to the import failures. This is a sample JSON response that contains a failureOutputFiles object:

```
{
  "version": 1,
  "status": "Imported",
  "statusDescription": "Data has been successfully imported",
  "recordLimit": 0,
  "updateMode": "replace",
  "headerRowIncluded": true,
  "id": "039685fa-85fd-4c1c-944e-20d45d1b1538",
  "name": "Customer Data Definition",
  "dataDescriptorId": "64d61e4e-1364-4e48-a963-8094c7fac995",
  "fieldDelimiter": ",",
  "fileLocation": "s3://<server>/data/tenants/<tenant>/tmp/21fcb1ba-c95f-45b9-adac-
  "dataTableId": "3a54edd0-b0d9-4a11-b0ff-e9ce1d2d39f5",
  "fileType": "CSV",
  "links": [ <links removed> ],
  "jobID": "039685fa-85fd-4c1c-944e-20d45d1b1538",
  "jobStepID": "0c916211-d951-4352-b8e0-ff32c557f9bc",
  "inputFileName": "input_file.csv",
  "tableName": "a0000_4722_12col2id_cust",
  "startTime": "Tuesday, July 24, 2018 7:19:21 PM UTC",
  "endTime": "Tuesday, July 24, 2018 7:34:07 PM UTC",
  "statusInfo": {
    "importValidation": {
      "status": "Validated",
      "startTime": "Tuesday, July 24, 2018 7:19:22 PM UTC",
      "endTime": "Tuesday, July 24, 2018 7:19:24 PM UTC",
      "messages": {}
    },
    "dataProcessing": {
      "status": "Complete",
      "startTime": "Tuesday, July 24, 2018 7:19:24 PM UTC",
      "endTime": "Tuesday, July 24, 2018 7:19:25 PM UTC",
      "messages": {
      "info": {
        "Total Number of Records Uploaded": 10000
      }
      }
    },
    "identityProcessing": {
      "status": "Completed Identities",
```

```
        "startTime": "Tuesday, July 24, 2018 7:19:26 PM UTC",
        "endTime": "Tuesday, July 24, 2018 7:34:07 PM UTC",
        "messages": {
          "info": {
            "Total Number of Identities Created": 10000,
            "Total Number of Identities Rejected": 0,
            "Total Number of Records Processed": 10000,
            "Total Number of Identities Updated": 0,
            "Total Number of Records Not Processed": 0
            }
          }
      },
      "inputFileProcessing": {}
    },
    "jobStartTimeInMillis": 0,
    "failureOutputFiles": [
      {
        "path": "7eaaf04fcd5f4e659168902b0fdc7dd4/checkpoints/14250/039685fa-85fd-4c1
          38_import/failure_list",
        "url": "https://<server>/7eaaf04fcd5f4e659168902b0fdc7dd4/checkpoints/14250/0
          20d45d1b1538_import/failure_list?X-Amz-Security-Token=<security_token>&X-Am
          SHA256&X-Amz-Date=20180731T163727Z&X-Amz-SignedHeaders=host&X-Amz-Expires=7
          <credential>&X-Amz-Signature=<signature>"
      }
    ],
    "contentName": "Customer Data Definition"
  }
```

3 Resolve any issues in these rows and submit a new import job with the corrected data.

Using a Transient Table for Temporary PII Data

About Transient Tables

In some cases you want to use customer data to build a customer segment but discard the personal identifiable information (PII) afterward. When you create an import descriptor with the **`transient`** or **`transientDeviceIdList`** data types, the customer data is kept only long enough to build a data set for the system that is using it.

To use PII data temporarily for a task and then discard it, SAS Customer Intelligence 360 completes these actions:

1 creates a temporary table to store the customer data

2 creates a segment that maps the customer data to the corresponding identity records in the system

3 deletes the uploaded file and the temporary table

Here are a few scenarios in which you would use a transient list:

- recording replies or click-through events for an email campaign, and then associate this data with existing customers in the system
- using merge tags to personalize messages or creatives in an email or mobile task
- sending bulk push notifications to a list of device IDs

In some of these scenarios, you might already have customer data that is not PII, similar to this example:

```
subject_id,email
10001,sample_email@gmail.com
```

You later receive PII data that is associated with customers in this list:

```
subject_id,email,first_name,last_name,age
10001,sample_email@gmail.com,First,Last,20
```

You can use the transient table to temporarily associate the PII data with the original data (based on a common data column).

Upload Transient Data

To set up a transient data descriptor for a task:

1 (Optional) Upload the data descriptor and data for your basic customer data (not the PII data).

For example, you could use this data descriptor:

```
{
   "name": "MyImportedList",
   "type": "importedList",
   "makeAvailableForTargeting": false,
   "dataItems": [
   {
     "label": "My List",
     "type": "STRING",
     "delimiter": ",",
     "tags": ["IMPORTEDLIST"],
     "excludeFromAnalytics": true,
     "identity": true,
     "identityType": "subject_id",
     "customProperties": {
       "Label": "My List"
     },
     "key": false,
     "uniqueValuesAvailable": false,
     "segmentation": true,
     "segmentProfilingField": false,
     "channelContactInformation": true,
     "identityAttribute": false
   }],
   "customProperties": {}
```

```
}
```

These data records match the data descriptor:

```
subject_id
00162BtkPrAAJ
00462BtkPqAAJ
```

2 Create an import descriptor for the transient data. Set the attributes based on how you plan to use the imported data:

- Set the type attribute to **`transient`** for web and email scenarios, such as personalizing creatives and messages.
- Set the type attribute to **`transientDeviceIdList`** for mobile scenarios in which you are targeting a list of device IDs.
- Set the channelContactInformation attribute to **`true`** for any data items that will be used in merge tags.
- Add the EMAIL_CONTACT field tag to data items that contain email addresses.

Note: The transient descriptor and the PII data can have more rows than the original data, but the import descriptor must reference the unique identity column in the original data. To link your PII data with existing identity data in the system, include at least one identity column that matches an existing column in the system with the isIdentity attribute set to **`true`**.

For detailed settings based on different use cases, "Settings for Different Use Cases" on page 211

A sample descriptor that corresponds to the subject ID example would look similar to this:

```
{
    "name": "transient_table",
    "description": "transient table",
    "type": "transient",
    "makeAvailableForTargeting": false,
    "dataItems": [
        {
            "name": "subject_id",
            "label": "subject ID",
            "description": "Subject ID",
            "type": "STRING",
            "tags": ["DEMOGRAPHICS"],
            "excludeFromAnalytics": true,
            "identity": true,
            "identityType": "subject_id"
        },
        {
            "name": "email",
            "label": "email",
            "description": "Email address",
            "type": "STRING",
            "tags": [
                "DEMOGRAPHICS","EMAIL_CONTACT"
            ],
            "channelContactInformation": true,
            "excludeFromAnalytics": true
        },
```

```
            {
                "name": "first_name",
                "label": "first name",
                "description": "First name",
                "type": "STRING",
                "tags": ["DEMOGRAPHICS"],
                "channelContactInformation": true,
                "excludeFromAnalytics": true
            },
                                             {
                "name": "last_name",
                "label": "last name",
                "description": "Last name",
                "type": "STRING",
                "tags": ["DEMOGRAPHICS"],
                "channelContactInformation": true,
                "excludeFromAnalytics": true
            },
                                             {
                "name": "age",
                "label": "age",
                "description": "Age",
                "type": "STRING",
                "tags": ["DEMOGRAPHICS"],
                "excludeFromAnalytics": true
            }
        ]
    }
```

For more information, see "Creating an Import Descriptor" on page 185.

> **TIP** Before you upload data for this descriptor, verify that you can see the data descriptor in the user interface at **General** ⇨ **Data Management** ⇨ **Data Sources**.

3 Upload the PII data through the user interface on page 23 or through the REST API on page 198. Associate the data with the transient descriptor when you upload it.

   Before you can use this data in a task, you might need to wait a few hours for the system to process the imported list and create any new identities.

4 Create a new task, and target the imported list that is associated with your upload. For more information, see "Types of Tasks" on page 986.

5 Publish the task.

When the system completes the task, the segment is deleted. Metrics and conversion data for the task is associated with the customers' identity records, but the imported PII is not kept in the system. For example, if you used the segment in an email task, the system uses the temporary segment to personalize the emails (with information such as customers' names). After the emails are sent, that data is deleted.

Settings for Different Use Cases

There are some common use cases in which you want to use transient data. Use these guidelines to ensure that your transient data is usable in segments and tasks.

Using an Email Contact That Is Not Stored

In this use case, assume that you have existing data that meets these criteria:

- the customer data is not transient
- the email information is not stored in the system

To upload transient data that is associated with this data, follow these guidelines when you create the import descriptor:

1. Set the descriptor's type to `transient`.
2. Include a data item that matches an identity column in the existing data. Set these values for this data item:
   - set the identity attribute to `true`
   - set the identityType attribute to the same value as the identity column for the data that exists in the system
3. Include a data item for the email addresses. Set these properties on that data item:
   - set the identity attribute to `false`
   - in the tags property, include EMAIL_CONTACT

Targeting Device IDs for Mobile Tasks

In this use case, assume you have a list of device IDs that you want to target for Push Notification tasks. You do not necessarily have any existing data that is related to these device IDs.

To upload transient data with these device IDs, follow these guidelines when you create the import descriptor:

1. Set the descriptor's type to `transientDeviceIdList`.
2. Include a data item for the device ID, and set these values for the data item:
   - the type attribute must be `STRING`
   - the identityType attribute must be `device_id`
   - these attributes must be set to `true`:
     - excludeFromAnalytics
     - identity
   - these attributes must be set to `false`:
     - availableForTargeting

- channelContactInformation
- identityAttribute
- segmentation
- segmentProfilingField
- uniqueValuesAvailable

This is a sample import descriptor that you could use to import device IDs:

```
{
    "name": "deviceIdList",
    "description": "Sample table for transient device_id list",
    "type": "transientDeviceIdList",
    "makeAvailableForTargeting": false,
    "dataItems": [
        {
            "name": "device",
            "label": "device",
            "description": "device_id data",
            "type": "STRING",
            "tags": [],
            "excludeFromAnalytics": true,
            "identityType": "device_id",
            "customProperties": {},
            "predefinedValues": [],
            "identity": true,
            "uniqueValuesAvailable": false,
            "segmentProfilingField": false,
            "channelContactInformation": false,
            "identityAttribute": false,
            "availableForTargeting": false,
            "segmentation": false,
            "key": false
        }],
    "customProperties": {}
}
```

This is a sample list of data that you can import with this descriptor:

```
device_id
68753A444D6F12269C600050E4C00067
54268B233A4F21348B721762D2B00054
41294F715E3A65487E386548F5A00023
```

Importing Transient Data from SAS Marketing Automation

In this use case, assume that you have existing data that meets these criteria:

- the customer data is transient
- the email information is not set as an identity column
- the data that you want to upload is from SAS Marketing Automation

To upload transient data that is associated with this data, follow these guidelines when you create the import descriptor:

1 Include a data item that matches an identity column in the existing data. Set these values for this data item:

- set identity to **`true`**
- set identityType to the same type as the identity column for the data that exists in the system

2 For the data item that matches the email address column, set these properties on that data item:

- set identity to **`false`**
- in the tags property, include EMAIL_CONTACT

Sample Data Descriptors and Data

Sample Customer Identities

This data type is used for uploading customer data. The imported data is processed for identities (regardless of the presence of identity data items). As a result, the data can be used for analytics and segmentation. For more information, see “Creating an Import Descriptor” on page 185.

Data Descriptor for Customer Identities

This JSON code is an example of a data descriptor that is used to import customer data:

```
{
  "name": "sample_descriptor",
  "description": "customer tables",
  "type": "customer",
  "makeAvailableForTargeting": false,
  "dataItems": [
  {
    "name": "customer_id",
    "label": "Customer ID",
    "description": "Customer ID",
    "type": "STRING",
    "tags": ["DEMOGRAPHICS"],
    "identity": true,
    "identityType": "customer_id",
    "excludeFromAnalytics": true
  },
  {
    "name": "email",
    "label": "email",
    "description": "email address",
    "type": "STRING",
    "tags": ["DEMOGRAPHICS", "EMAIL_CONTACT"],
    "excludeFromAnalytics": true,
    "identity": false,
    "segmentation": true
```

```
        },
        {
          "name": "gender",
          "label": "Gender",
          "description": "Gender",
          "type": "STRING",
          "tags": ["DEMOGRAPHICS"],
          "excludeFromAnalytics": true,
          "predefinedValues": ["M","F"],
          "segmentProfilingField": true,
          "segmentation": true,
          "uniqueValuesAvailable": true
        },
        {
          "name": "age",
          "label": "Age",
          "description": "Age",
          "type": "INT",
          "tags": ["DEMOGRAPHICS"],
          "excludeFromAnalytics": true,
          "segmentation": true
        },
        {
          "name": "purchasedate",
          "label": "Recent Purchase Date",
          "description": "Recent Purchase Date",
          "type": "TIMESTAMP",
          "tags": ["DEMOGRAPHICS"],
          "excludeFromAnalytics": true,
          "segmentation": true
        },
        {
          "name": "purchasevalue",
          "label": "Recent Purchase Value",
          "description": "Recent Purchase Value",
          "type": "DOUBLE",
          "tags": ["DEMOGRAPHICS"],
          "excludeFromAnalytics": true,
          "segmentation": true
        },
        {
          "name": "emailok",
          "label": "Email is approved",
          "description": "customer can recieve emails",
          "type": "STRING",
          "tags": ["DEMOGRAPHICS", "EMAIL"],
          "excludeFromAnalytics": true,
          "customProperties": {},
          "predefinedValues": [],
          "identity": false,
          "key": false,
          "segmentProfilingField": false,
          "uniqueValuesAvailable": false,
          "segmentation": false,
          "channelContactInformation": true,
          "identityAttribute": false
```

```
  }]
}
```

Customer Data for Identities

This sample data corresponds to the structure that is described in the sample data descriptor:

```
user_email,customer_id,gender,age,purchasedate,purchasevalue,emailok
abc_mb1@gmail.com,cust1_mb1,M,32,2017-03-02,123.45,no
abc_mb2@gmail.com,cust1_mb2,M,18,2016-12-12,56.78,yes
abc_mb3@gmail.com,cust1_mb3,F,67,2016-05-16,1032.90,yes
abc_mb4@gmail.com,cust1_mb4,F,14,2001-10-27,21.12,no
abc_mb5@gmail.com,cust1_mb5,F,27,2016-04-20,908.47,yes
```

TIP Before you upload any customer data, ensure that the data for a single customer is in one row only. For example, do not include the same customer with different login IDs in multiple rows.

Sample Data Descriptor Using Identity IDs

Importing data with identity IDs is useful for scenarios such as creating segments or analytic scores externally and importing the results back into SAS Customer Intelligence 360. This descriptor is an example:

```
{
    "name": "External _Analytics_Process",
    "description": "customer predictive table",
    "type": "customer",
    "makeAvailableForTargeting": false,
    "dataItems": [
        {
            "name": "Identity ID",
            "label": "Identity_ID",
            "description": "Descriptor for identity ID",
            "type": "STRING",
            "identity": true,
            "identityType": "identity_id",
            "key": true,
            "segmentation": false,
            "uniqueValuesAvailable": false,
            "tags": [],
            "customProperties": {},
            "excludeFromAnalytics": false,
            "segmentProfilingField": false,
      "identityAttribute": false,
            "channelContactInformation": false
        },
        {
            "name": "Predictive_Score",
            "label": " Predictive_Score",
            "description": "Analytic Score data",
            "type": "DOUBLE",
```

```
                "tags": [
                  "DEMOGRAPHICS",
                  "ANALYTICS"
                ],
                "excludeFromAnalytics": false,
                "key": false,
                "identity": false,
                "segmentProfilingField": true,
                "segmentation": true,
                "identityAttribute": false,
                "availableForTargeting": true,
                "channelContactInformation": false,
                "uniqueValuesAvailable": false
            }

        ],
        "customProperties": {}
}
```

Sample Imported Lists

An imported list is a data type that contains predefined segments, such as linkable cells, that conform to the data model for SAS Customer Intelligence version 6 or later. For more information, see “Creating an Import Descriptor” on page 185.

Data Descriptor for an Imported List

This JSON script is an example of a data descriptor for an imported list:

```
{
  "name": "sample_data_tc01",
  "description": "all data types",
  "type": "importedList",
  "makeAvailableForTargeting": false,
  "customProperties": {},
  "dataItems": [
  {
    "name": "sample_data_Subject",
    "label": "sample_data_subject",
    "description": "subject ID",
    "type": "STRING",
    "delimiter": "",
    "identity": true,
    "identityType": "subject_id",
    "predefinedValues": ["SUB1002","SUB1001"],
    "segmentation": true,
    "excludeFromAnalytics": true,
    "uniqueValuesAvailable": false,
    "segmentProfilingField": true,
    "tags": ["DEMOGRAPHICS","IMPORTLIST"],
    "customProperties": {
      "Status ": "Active",
      "Source": "SAS Marketing Automation",
      "Node Name": "Gender Male",
```

```
      "Node Code": "CELL44385",
      "Campaign Name": "Sample ExtSeg01",
      "Campaign Code": "CAMP6420",
      "Campaign Folder": "CI Assets\\Business Contexts
         \\MA_CI360_ma_tenant\\sample",
      "Business Context Name": "MA_CI360_ma_ora_small",
      "Node Count": "125607",
      "Date Last Run": "Feb 10, 2018 10:55:22 AM",
      "Date Modified": "Feb 10, 2018 10:55:23 AM",
      "Modified By": "kichun",
      "Subject": "SUBJECT_ID_CUSTOMER",
      "Node Description": "",
      "Campaign Description": "",
      "Label": "Sample ExtSeg01 - Gender Male"
    }]
}
```


Customer Data for an Imported List

This CSV example is customer data that corresponds to the data descriptor for imported lists:

```
subject_id
sub1_mb1
sub1_mb2
sub1_mb3
sub1_mb4
sub1_mb5
```

Sample Transient List for Device IDs

Data Descriptor for Transient Device List

This is a sample import descriptor that you could use to import device IDs:


```
{
    "name": "deviceIdList",
    "description": "Sample table for transient device_id list",
    "type": "transientDeviceIdList",
    "makeAvailableForTargeting": false,
    "dataItems": [
        {
            "name": "device",
            "label": "device",
            "description": "device_id data",
            "type": "STRING",
            "tags": [],
            "excludeFromAnalytics": true,
            "identityType": "device_id",
            "customProperties": {},
            "predefinedValues": [],
            "identity": true,
```

```
            "uniqueValuesAvailable": false,
            "segmentProfilingField": false,
            "channelContactInformation": false,
            "identityAttribute": false,
            "availableForTargeting": false,
            "segmentation": false,
            "key": false
        }],
    "customProperties": {}
}
```

Sample Data for Transient Device List

This is sample data that corresponds to the import descriptor with transientDeviceIdList type:

```
device_id
68753A444D6F12269C600050E4C00067
54268B233A4F21348B721762D2B00054
41294F715E3A65487E386548F5A00023
```

Sample Contact Preferences

Data Descriptor for Contact Preferences

This is a sample data descriptor that is used to import customers' contact preferences:

```
{
  "name": "contact_preference",
  "description": "contact preference descriptor",
  "type": "contact_preference",
  "makeAvailableForTargeting": false,
  "dataItems": [
    {
      "label": "identity_type_cd",
      "description": "Identity Type Code",
      "type": "STRING",
      "delimiter": "",
      "tags": [],
      "excludeFromAnalytics": true,
      "customProperties": {},
      "channelContactInformation": false,
      "identityAttribute": false,
      "key": true,
      "identity": false,
      "uniqueValuesAvailable": false,
      "segmentation": false,
      "segmentProfilingField": false
    },
    {
      "label": "identity_value",
      "description": "Identity Value",
```

```
      "type": "STRING",
      "delimiter": "",
      "tags": [],
      "excludeFromAnalytics": true,
      "customProperties": {},
      "channelContactInformation": false,
      "identityAttribute": false,
      "key": true,
      "identity": false,
      "uniqueValuesAvailable": false,
      "segmentation": false,
      "segmentProfilingField": false
    },
    {
      "label": "preference_type_cd",
      "description": "Preference Type Code",
      "type": "STRING",
      "delimiter": "",
      "tags": [],
      "excludeFromAnalytics": true,
      "customProperties": {},
      "channelContactInformation": false,
      "identityAttribute": false,
      "key": true,
      "identity": false,
      "uniqueValuesAvailable": false,
      "segmentation": false,
      "segmentProfilingField": false
    },
    {
      "label": "preference_value",
      "description": "Preference Value",
      "type": "STRING",
      "delimiter": "",
      "tags": [],
      "excludeFromAnalytics": true,
      "customProperties": {},
      "channelContactInformation": false,
      "identityAttribute": false,
      "key": false,
      "identity": false,
      "uniqueValuesAvailable": false,
      "segmentation": false,
      "segmentProfilingField": false
    }
  ]
}
```


Contact Preference Data for Customers

This is sample data that matches the descriptor for contact preferences:

```
id_type_cd,id_value, preference_type_cd,preference_value,
email_id,sample_person1@email.com,email_ok,false
email_id,sample_person2@email.com,email_ok,false
```

21

Exporting Data

Accessing the External API Gateway

Complete the steps in these sections if you have not already configured the external API gateway.

Whitelist Domains

To communicate with SAS Customer Intelligence 360, you must whitelist specific domains in your firewall depending on the action that you want to perform. The following table lists the domains that need to be whitelisted.

CAUTION! Limit how often requests are made to the external API gateway. The external API gateway is configured to limit the number of requests from a single IP address to 45,000 requests per five minutes (150 requests per second). The limit includes all REST requests to the API gateway. An HTTP 403 (Forbidden) code is returned if a request is made after the limit has been exceeded for the trailing five minutes.

Table 21.1 Domains to Whitelist

Action	Domains to Whitelist
Access the SAS Customer Intelligence 360 user interface	Europe: https://platform-euw.ci360.sas.com https://design-euw.ci360.sas.com US: https://platform-use.ci360.sas.com https://design-use.ci360.sas.com
Discover download	Europe: https://extapigwservice-eu-prod.ci360.sas.com https://ci-360-deployment-prod-eu-west-1.s3-eu-west-1.amazonaws.com https://ci-360-datahub-data-prod-eu-west-1.s3.amazonaws.com US: https://extapigwservice-prod.ci360.sas.com https://ci-360-deployment-prod-us-east-1.s3.amazonaws.com https://ci-360-datahub-data-prod-us-east-1.s3.amazonaws.com
Connect the on-premises access point	Europe: https://extapigwservice-eu-prod.ci360.sas.com US: https://extapigwservice-prod.ci360.sas.com
Upload bulk events	Europe: https://extapigwservice-eu-prod.ci360.sas.com https://ci-360-datahub-transfers-prod-eu-west-1.s3.amazonaws.com US: https://ci-360-datahub-transfers-prod-us-east-1.s3.amazonaws.com https://extapigwservice-prod.ci360.sas.com
Export data (contact and responses) and upload data (customer, opt out, and so on), including uploading lists from SAS Customer Intelligence 6.*x*	Europe: https://design-euw.ci360.sas.com https://ci-360-datahub-transfers-prod-eu-west-1.s3.amazonaws.com US: https://design-use.ci360.sas.com https://ci-360-datahub-transfers-prod-us-east-1.s3.amazonaws.com

Create an Access Point Definition

1. Sign in to SAS Customer Intelligence 360.
2. Select General Settings and then select **External** ⇨ **Access**.
3. Click .
4. Click **Access Point Credentials** and then enter a staging name in the **Name** field.

   Note: The name must match the configuration for the on-premises access point.

   The **ID** is automatically generated by the system.
5. To add access point credentials (that is, a key for the access point), click **Add**.

   Note: Remember the tenant ID and the client secret because they are used when you configure the on-premises access point for the various use cases.
6. To activate the access point, select **Active**. By default, the status of the access point is **Inactive**.

   Note: You must add access point credentials before you can change the status of the access point to Active.
7. To identify the events that you want SAS Customer Intelligence 360 to send to the access point, click **Associations**, and then complete these actions:

   a. Select **Select events**.

   b. Click .

   c. Select the check box in the row for the event that you want to add. To add all events in the table, select the check box in the top row of the event table.

   d. Click **OK**.
8. Click **Associations**, select the identity type that you configured in "Set Up Customer Identities for Access Points" on page 817 and then click .

   Note: If you are going to use the external API gateway to stage events from an external application to SAS Customer Intelligence 360, you must select only the associated ID for the identity type that is being sent in the REST request. An incorrect ID is returned if you select additional associated IDs.
9. In the **Create New Credentials** dialog box, click **OK** to accept the system-generated **Tenant ID** and **Client secret**.
10. If necessary, you can replace or remove the system-generated client secret. To replace the client secret, click **Replace**, and then click **OK** in the **Create New Credentials** dialog box. To remove the client secret, click **Remove**, and then click **Yes** in the confirmation dialog box.

    Note: If you generate a new client secret, you must also generate a new JWT. To change the client secret, edit the access point defined in the interface and click **Replace** in the Credentials section.
11. Click **Done**. The access point appears in the table on the **Access** page.

Generate the JWT

Access to the external API gateway is controlled by a JWT that is generated from the tenant ID and a string that is used as a client secret. JWTs are self-contained objects that enable two parties to transmit data securely between them. JWTs are defined by the RFC 7519 standard. They are digitally signed and can be independently verified.

Here are two methods that you can use to generate a JWT:

- an online tool such as JSON Web Token by Stormpath
- a local installation of Python and the pyjwt package

To generate a JWT with a local Python installation:

1 Install version 3.x or later of Python (external link).

2 Use the pip command in Python to install the pyjwt package. For example:

```
c:\>c:\Python27\Scripts\pip.exe install pyjwt
Collecting pyjwt
  Using cached PyJWT-1.5.2-py2.py3-none-any.whl
Installing collected packages: pyjwt
Successfully installed pyjwt-1.5.2
```

3 Start Python, and use the interactive Python console to generate a JWT. For example:

```
c:\>c:\Python27\python.exe
Python 2.7.13 (v2.7.13:a06454b1afa1, Dec 17 2016, 20:42:59)
[MSC v.1500 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> import jwt
>>> import base64
>>> tenant_id = "<tenant ID>"
>>> client_secret = "<client secret>"
>>> client_secret_bytes = bytearray(client_secret, 'ascii')
>>> token = jwt.encode({'clientID': "<tenant ID>"}, base64.b64encode (client_secret_bytes),a
>>> print(token)
>>> quit()
```

The print() function of this script displays the value for the JWT in the console window.

For REST calls and other access points to connect to the external API gateway, the JWT must be included in the HTTP Authorization header as ***<type> <credentials>***, where *type* is **Bearer** and *credentials* is the JWT string. For example, the Authorization header of a REST call might look like this example:

```
Bearer eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.ey...J9.3WIGMwJ_7z_HAavu5-oqgQCZNIp1aqj
```

Exporting Customer Identity Data

You can export identity data based on known identities with the customerJobs endpoint for the external API gateway. This API is used to get all imported or collected data about one or more individuals. When you submit a request, the system queries all customer tables and joins them to create a header file and a corresponding data file to download.

The primary purpose for this API endpoint is to provide a way for you to export all customer data as part of the GDPR request. For more information about GDPR support, see “About GDPR Support in SAS Customer Intelligence 360”.

Note: Before you export data, make sure that all import jobs are complete. Check the status of upload jobs in the user interface or with the REST API, and verify that the status for import jobs is set to “IMPORTED”.

To export identity data:

1. Set up access to the external API gateway on page 221.

2. Send a POST call to the customerJobs endpoint to submit an export request. The call is similar to this example:

   ```
   POST https://extapigwservice-<server>/marketingGateway/customerJobs
   ```

   Note: Be sure to use the JWT as the authentication token when you submit the request.

   In the body of the REST call, define the export request as a JSON object:

   ```
   {
     "jobType": "GDPR_EXPORT",
     "outputIdentityTypes": [
       "login_id",
       "subject_id",
       "visitor_id"
     ],
     "identityType": "subject_id",
     "identityList": [
       "12343455"
     ]
   }
   ```

   The export request contains these members:

   Table 21.2 Members of the Customer Export Request

Name	Type	Description
jobType	String	The job type. Set this value to **GDPR_EXPORT**.

Name	Type	Description
outputIdentityTypes	List	The types of identities to export. These are the valid values: ■ customer_id ■ device_id ■ identity_id When you import data with an identity ID, no identity processing is done. Imported data is associated directly with existing customer records. For an example, see "Sample Data Descriptor Using Identity IDs". Note: To use this identityType value, the import descriptor's type must be **`customer`**. ■ login_id ■ subject_id ■ visitor_id The format for the list is similar to this example: `["login_id","subject_id"]`
identityType	String	The identity type that you are using to search the database. Use one of these values: ■ customer_id ■ device_id ■ identity_id When you import data with an identity ID, no identity processing is done. Imported data is associated directly with existing customer records. For an example, see "Sample Data Descriptor Using Identity IDs". Note: To use this identityType value, the import descriptor's type must be **`customer`**. ■ login_id ■ subject_id ■ visitor_id

Name	Type	Description
identityList	List	The actual values of customer identities that are used to retrieve customer data. For example, if you specify a subject ID, data that is associated with the login ID and customer ID is also retrieved for that customer. Follow these guidelines: ■ The value should match a real customer identity in the system. ■ Values must match the type that is specified for identityType. The format for this value is similar to this example: `["subject_id1","subject_id2","subject_id3"]` In the output data, a blank row is returned if there is no data associated with that ID.

The response to the POST call contains the export request ID.

3 Submit a GET call with the request ID to view the status and to download the customer data. The GET call is similar to this example:

```
GET https://<server>/marketingGateway/customerJobs?exportRequestId=<export_request_
```

The response contains the status of the export request. When the status is **EXPORTED**, the response body contains a downloadItems field with temporary links to this data:

- a header file
- CSV files with the exported data

Exporting Customer Event Data

Use the eventJobs endpoint of the external API gateway to export event data from your system. This API is used to retrieve all event data for one or more individuals that was gathered by SAS Customer Intelligence 360. When you submit a request, this API queries the event tables and attribute tables and joins them together to create a header file and a corresponding data file to download.

The main purpose of this API is to provide a way for you to export all behavioral data (events) as part of the GDPR request. For more information about GDPR support, see “About GDPR Support in SAS Customer Intelligence 360”.

To submit export requests that can be more detailed, you can use the ad hoc export API.

Note: Before you export data, make sure that all import jobs are complete. Check the status of upload jobs in the user interface or with the REST API, and verify that the status for import jobs is set to “IMPORTED”.

To export event data:

1 Set up access to the external API gateway on page 221.

2 Send a POST call to the eventJobs endpoint to submit an export request for event data. The POST call is similar to this example:

```
POST https://extapigwservice-<server>/marketingGateway/eventJobs
```

Note: Be sure to use the JWT as the authentication token when you submit the request.

In the body of the call, define the export request as a JSON object:

```
{
  "jobType": "GDPR_EXPORT",
  "outputIdentityTypes": [
    "login_id",
    "subject_id",
    "visitor_id"
  ],
  "identityType": "subject_id",
  "identityList": [
    "12343455"
  ]
}
```

The event export request contains these members:

Table 21.3 *Members of the Event Export Request*

Name	Type	Description
jobType	String	The job type. Set this value to **`GDPR_EXPORT`**.
outputIdentityTypes	List	The types of identities to export. These are the valid values: ■ customer_id ■ device_id ■ identity_id When you import data with an identity ID, no identity processing is done. Imported data is associated directly with existing customer records. For an example, see “Sample Data Descriptor Using Identity IDs”. Note: To use this identityType value, the import descriptor’s type must be **`customer`**. ■ login_id ■ subject_id ■ visitor_id The format for the list is similar to this example: `["login_id","subject_id"]`

Name	Type	Description
identityType	String	The identity type that you are using to search the database. Use one of these values: ■ customer_id ■ device_id ■ identity_id When you import data with an identity ID, no identity processing is done. Imported data is associated directly with existing customer records. For an example, see “Sample Data Descriptor Using Identity IDs”. Note: To use this identityType value, the import descriptor’s type must be `customer`. ■ login_id ■ subject_id ■ visitor_id
identityList	List	The actual values of customer identities that are used to retrieve customer data. For example, if you specify a subject ID, event data that is associated with the login ID and customer ID is also retrieved for that customer. Follow these guidelines: ■ The value should match a real customer identity in the system. ■ Values must match the type that is specified for identityType. The format for this value is similar to this example: `["subject_id1","subject_id2","subject_id3"]` In the output data, a blank row is returned if there is no event data associated with that ID.

The response to the POST call contains the request ID.

3 Use the request ID to view the request’s status. Submit a GET call similar to this example:

```
GET https://extapigwservice-<server>/marketingGateway/eventJobs?exportRequestId=<ex
```

The response contains the status of the export request. When the status is **`EXPORTED`**, the response body contains a downloadItems field with temporary links to this data:

- a header file
- CSV files with the exported data

Exporting Data from SAS 360 Discover

You can use the external API gateway to download data that was collected by SAS 360 Discover. For more information, see “Downloading Data from SAS Customer Intelligence 360”.

Exporting Data with the Ad Hoc Export API

Submit an Export Request

The data hub provides an ad hoc export to retrieve custom exports of data based on filters that you define. Typically, this method is used to export event data or user preference data that has been imported through multiple jobs. Here are some examples of data sets that you can export:

- all events from the email channel for a certain period of time
- impressions and conversions for a particular task
- 30 days of purchase data based on the purchase event

Note: Before you export data, make sure that all import jobs are complete. Check the status of upload jobs in the user interface or with the REST API, and verify that the status for import jobs is set to “IMPORTED”.

Complete these steps to submit an export request:

1 Set up access to the external API gateway on page 221.

2 Send a POST call to the exportRequestJobs endpoint:

```
POST https://extapigwservice-<server>/marketingGateway/exportRequestJobs
```

Note: Be sure to use the JWT as the authentication token when you submit the request.

In the body of the REST call, include JSON code that defines your export request. Here is an example of a simple JSON request:

```
{
  "contentName": "simple_filter_export",
  "entity": "events",
  "identityTypes": ["subject_id", "visitor_id"],
  "dataItemNameList":
    ["eventname", "event_timestamp", "product_quantity_num"],
```

```
    "dataFilter": {
      "type": "SimpleFilter",
      "dataItem": "eventname",
      "op": "EQ",
      "value": "impression"
    },
    "exportAll": false,
    "start": "2018-04-29 23:59",
    "interval": 744
  }
```

Specify these data members in the JSON code for an export request:

Table 21.4 *Data Members for an Export Request*

Name	Type	Description
contentName	String	The name for the export request.
entity	String	The type of data to export. Currently, the value must be **`events`**.
identityTypes	List	The list of identity types to export. In the exported data, each entity record lists any values for these identity types if they exist. The format for this list is similar to this example: `["subject_id", "visitor_id"]`

dataItemNameList	List	The list of data items to export. The data item names depend on the entity type that you are exporting.
		This example shows a list that uses the default delimiter:
		`["item_1",`
		`"item_2",`
		`"item_3"]`
		For a list of valid names, see "Reference for Data Items".

dataFilter	Object	A filter object that filters the export data by conditions that you define. You can use a simple filter or a complex filter. For more information about filters, see "Filtering Data Items in REST API Calls".

Name	Type	Description
delimiter	String	(Optional) Specifies the delimiter that is used to separate items in the export file. These delimiters are supported: ■ `,` This value is the default when the delimiter attribute is not set. ■ `|` ■ `;` ■ `\t`
exportAll	Boolean	Specifies whether to export all the data that is associated with the data item names. ■ Set the value to `true` when the dataFilter object is empty. ■ Set the value to `false` when you define a dataFilter object.
start	String	The date and time for the beginning of the data set. The format for this value is UTC, which is similar to this example: `"2018-04-29 23:59"` The collection period for your exported set is based on any combination of the start, interval, and end parameters.
interval	Number	The number of hours worth of data to export. This value must be an integer. The maximum value is `744`. Note: The export API can export only 31 days of data in a single request (744 hours). To export data for multiple months, submit a separate export request for each month.

Name	Type	Description
end	String	The date and time for the end of the data set. The format for this value is UTC, which is similar to this example: `"2018-04-29 23:59"` The collection period for your exported set is based on any combination of the start, interval, and end parameters.

When you submit the REST call, the response shows the request object with an associated request ID.

3 Download the data.

a Submit a GET call with an export request's ID to see the request's status:

```
GET https://extapigwservice-<server>/marketingGateway/exportRequests/<export_req
```

The response is a summary of the export request, including a status field. The status for an active request is NOT_STARTED, PROCESSING, or EXPORTED.

b When the status is EXPORTED, the export request includes a downloadItems object. Use the temporary URLs in the downloadItems object to download the data.

Manage Export Requests

These options describe how to manage existing export requests:

- To get a list of all export requests, send this REST call to the exportRequests endpoint:

  ```
  GET https://extapigwservice-<server>/marketingGateway/exportRequests
  ```

  To limit the number of results that are returned, use the start parameter and limit parameter. For example, this REST call returns only the first 50 export requests:

  ```
  GET https://extapigwservice-<server>/marketingGateway/exportRequests?start=0&limit=50
  ```

  Note: If you specify the start parameter but not the limit parameter, 10 results are returned by default.

- To get the details for a specific export request, send this REST call to the exportRequests endpoint:

  ```
  GET https://extapigwservice-<server>/marketingGateway/exportRequests/<export_request_ID>
  ```

- To delete an export request, send this REST call to the exportRequestJobs endpoint:

  ```
  DELETE https://extapigwservice-<server>/marketingGateway/exportRequestJobs/<export_reque
  ```

Reference for Data Items

When you submit an ad hoc export request on page 230 , the export descriptor specifies the data item names and filters to export.

Data Item Values

This table shows the relationship between data item names and their corresponding interface labels.

Table 21.5 Event Data Items

Domain Object ID	Description
account	Account name
activity_node_id	Node ID for an activity
browser_device_name	Name of the device that is associated with the web browser
browser_device_type	Name of the device type that is associated with the web browser
browser_language_name	Language that is set for the web browser
browser_name	Name of the web browser
browser_platform	Platform that is associated with the web browser
browser_platform_type	Platform type that is associated with the web browser
browser_platform_version	Version of the platform that is associated with the web browser
browser_version_no	Version of the web browser
cart_id	Cart ID
cart_number_of_items_cnt	Number of items in cart
cart_type_nm	Name of a cart type
channel_name	The channel that is associated with the session
contact_response_cd	Contact response code
creative_id	Creative ID

Domain Object ID	Description
creative_name	Creative name
cts	Client’s timestamp
domain	Domain name
domain_type	Code for the domain type
event_channel For a list of values to filter on, see “Event Channels”.	Channel
event_id	Event ID
event_timestamp	Event timestamp
event_type_nm For a list of values to filter on, see “Event Types (all)”.	Event type name
event_uid	Marketing event ID
eventname For a list of values to filter on, see “Event Names (all)”.	Event name
form_field_val	Value of a form field
form_nm	Form name
goal_name	Goal name
http_request_header_referer	Header text of the HTTP request
http_request_origination_type	Origination type of the HTTP request
http_request_origin	Origination value for the HTTP request
identity_id	Identity value for the customer
mkt_event_name	Name of the marketing event
mobile_app_version	Version of the mobile app
mobile_appid	ID of the mobile app
mobile_carrier_name	Name of the mobile carrier
mobile_country_code	Country code for the mobile device
mobile_device_mfg	Manufacturer’s name for the mobile device

Domain Object ID	Description
mobile_device_model	Model number for the mobile device
mobile_device_name	Name of the mobile device
mobile_device_type	Type that is associated with the mobile device
mobile_network_code	Code for the mobile device’s network
mobile_platform	Name of the mobile device’s platform
mobile_platform_type	Type that is associated with the mobile device’s platform
mobile_platform_version	Version number of the mobile device’s platform
mobile_screen_height	Height of the mobile device’s screen
mobile_screen_width	Width of the mobile device’s screen
page_desc	Page description
page_title_nm	Page title
payment_type_desc	Description of the payment type
processed_dttm	Processed value for a dateTime entry
product_availability_message	Product availability message
product_group	Name for the product group
product_id	Product ID
product_name	Product name
product_quantity_num	Numeric value for product quantity
product_savings_message	Product savings message (discount)
product_shipping_message	Product shipping message
product_sku	Product SKU
product_unit_price_num	Numeric value for the product unit price
region_nm	Region name
screen_info	Screen information for a mobile device
session	Session ID

Domain Object ID	Description
shippingCost_num	Shipping cost
spot_name	Spot name
task_id	Task ID
task_name	Task name
tax_num	Numeric value for the tax amount that is associated with a cart
totalCost_num	Numeric value for the cart total
traffic_source_nm	Name of the traffic source
uri	A domain's URI value
uri_txt	URI text that is associated with a domain
visitor_id	Visitor's ID
visitor_state	Specifies whether a visitor is a new or returning user

Event Channels

These values are valid for event channels (the event_channel data item):

- email

  This table shows event names and types that are valid for the email channel:

  Table 21.6 *Events for the Email Channel*

Event Name	Event Type
activity_flow_in	activity_flow_in
click	click
complaint	complaint
conversion	goal
hard_bounce	hard_bounce
open	open

Event Name	Event Type
opt-out	opt-out Note: This value can be augmented for a program. For example, if the event was in program named “ab”, the opt-out value would be `ab@opt-out`.
reply	reply
send	send
view	view

- mobile

  This table shows event names and types that are valid for the mobile channel:

  Table 21.7 Events for the Mobile Channel

Event Name	Event Type
activity_flow_in	activity_flow_in
activitystart	activitystart
bannerPress	bannerPress
button1Press	button1Press
button2Press	button2Press
button3Press	button3Press
defocus	defocus
focus	focus
milestone	goal
conversion	goal
load	load
messageDismiss	messageDismiss Note: This event is for push notifications.
NewSession	NewSession
notificationOpened	notificationOpened Note: This event is for push notifications.

Event Name	Event Type
impression	spot_change
spot_clicked	spot_clicked
spot_closed	spot_closed
spot_default_delivered	spot_default_delivered
spot_failed	spot_failed
spot_requested	spot_requested
impression_viewable	spot_viewable

- onprem

  Note: This value is used for external events.
- system

  Note: This value is used for events that are generated by activities.

  This table shows event names and types that are valid:

  Table 21.8 Events for the System Channel

Event Name	Event Type
activity_flow_in	activity_flow_in
activity_start	activity_start
milestone	goal
conversion	goal

- web

Event Types (all)

This is a list of all event types (event_type_nm data items) that are valid:

- abtestpathassignment
- activity_flow_in
- activity_flow_out
- activitystart
- bannerPress
- button1Press
- button2Press

- button3Press
- cartitem
- click
- complaint
- dataview
- defocus
- focus
- goal
- hard_bounce
- messageDismiss
- NewSession
- notificationOpened
- open
- opt-out

  Note: This value can be augmented for a program. For example, if the event was in program named “ab”, the opt-out value would be `ab@opt-out`.
- reply
- send
- spot_change
- spot_clicked
- spot_closed
- spot_default_delivered
- spot_failed
- spot_requested
- spot_viewable
- spot_viewable_goal
- submit
- view

Event Names (all)

This is a list of all event names (eventnm data items) that are valid:

- abtestpathassignment
- activity_flow_in
- activity_flow_out
- activitystart
- bannerPress
- button1Press
- button2Press

- button3Press
- cartitem
- click
- complaint
- conversion
- defocus
- focus
- hard_bounce
- impression
- impression_viewable
- messageDismiss
- milestone
- NewSession
- notificationOpened
- open
- opt-out
- PageView
- reply
- send
- spot_clicked
- spot_closed
- spot_default_delivered
- spot_failed
- spot_requested
- spot_viewable
- view

Filtering Data Items in REST API Calls

About Filters

You can create custom filters to narrow the results of REST API calls when you work with event data. These filters enable you to retrieve specific data items and their attributes and specify time frames of data.

Filters can include these items:

- timestamp intervals. For example, you can limit the selection to a previous week or a range such as 06/20/2016–06/27/2016.

- data items. For example, you can limit the selection to include records that have only a certain event name or data item number.
- attribute values. For example, you can limit the selection to include records that have only a certain event with a specific attribute value.

Note: If you create a filter with criteria that is not valid, the filter is ignored and the associated process continues without it.

Create a FilterItem Object

To filter data requests, you must first create a FilterItem object that describes how to filter the data. This filter is in addition to the timestamp filtering that occurs. Define FilterItem objects as children of a descriptor's FilterItem field.

Types of Filters

You can create these types of filters:

- SimpleFilter
- IsNullFilter
- CompoundFilter

SimpleFilter

A *SimpleFilter* object compares the value of a column (data item) to a value that you specify. This JSON example shows the structure of this filter:

```
{
  "type": "SimpleFilter",
  "dataItem": "<data_item_name>",
  "op": "EQ",
  "value": "my_item_name",
}
```

This table describes the attributes of a simple filter.

Table 21.9 Attributes of a SimpleFilter Object

Name	Description
type	The filter type. The value must be **SimpleFilter**.
dataItem	The name of the data item to filter on.
op	The Boolean operator. ■ Valid operators for character fields are **EQ** and **NE**. ■ Valid operators for numeric fields include **EQ**, **NE**, **GT**, **GTE**, **LT**, and **LTE**.
value	The value to match. The value must be a single value.

IsNullFilter

An *IsNullFilter* object checks if a column value is null. This JSON example shows the structure of this filter:

```
{
  "type": "IsNullFilter",
  "dataItem": "<data_item_name>",
  "negate": true
}
```

This table describes the attributes of an IsNullFilter object.

Table 21.10 Attributes of an IsNullFilter Object

Name	Description
type	The filter type. The value must be **IsNullFilter**.
dataItem	The name of the data item to filter on.
negate	(Optional) Specifies to negate the entire filter. This field is equivalent to specifying a Boolean NOT for the entire filter. The value can be **true** or **false**. The default value is **false**.

CompoundFilter

A *CompoundFilter* object combines other filters by using Boolean logic. This JSON example shows the structure of this filter:

```
{
  "type": "CompoundFilter",
  "op": "AND",
  "childFilterItems": [
    {
       // This could be a combination of SimpleFilter objects or IsNullFilter objects.
    }
  ],
}
```

This table describes the attributes of a CompoundFilter object.

Table 21.11 Attributes of a CompoundFilter Object

Name	Description
type	The filter type. The value must be **CompoundFilter**.

Name	Description
op	Here are the valid operators: ■ AND ■ OR
childFilterItems	A list of other filter objects.

The following JSON code shows the body of request that uses a complex filter:

```
{
  "contentName": "samplequery",
  "entity": "events",
  "identityTypes": [
    "device_id"
  ],
  "dataFilter": {
    "type": "CompoundFilter",
    "op": "AND",
    "childFilterItems": [{
      "type": "CompoundFilter",
      "op": "OR",
      "childFilterItems": [
        {
           "type": "SimpleFilter",
           "dataItem": "spot_name",
           "op": "EQ",
           "value": "spot2"
        },
        {
           "type": "SimpleFilter",
           "dataItem": "task_name",
           "op": "EQ",
           "value": "my task name"
        }
      ]
    }]
  }
}
```

Export Raw Tables with Customer Data

You can export the raw data tables from SAS Customer Intelligence 360 to perform diagnostics and confirm data integrity. The raw tables can enable you to:

- confirm that data is imported successfully
- confirm data values after updates or delete requests
- diagnose why segmentation results are different than you might expect

Note: Before you export data, make sure that all import jobs are complete. Check the status of upload jobs in the user interface or with the REST API, and verify that the status for import jobs is set to “IMPORTED”.

Complete these steps to export the raw data tables:

1 To confirm that a data table exists, submit a GET request with the data descriptor ID. The GET request is similar to this example:

```
GET https://design-<server>/SASWebMarketingMid/rest/debug/tables/<descriptor_ID>
```

The response from this call is a JSON object that defines the data table. The JSON contains the table’s name and any attributes that are associated with it.

To retrieve a list of data descriptor IDs, you can submit this GET request:

```
GET https://design-<server>/SASWebMarketingMid/rest/descriptors
```

2 Submit a POST request with the data descriptor ID to request an export. The POST request is similar to this example:

```
POST https://design-<server>/SASWebMarketingMid/rest/debug/tables/<descriptor_ID>/d
```

The response from the POST request contains a url attribute with a temporary URL to the download files. A full response is similar to this example:


```
{
  "downloadItemList": [
  {
    "path": "<relative_path_to_file>",
    "url": "https://<server>.amazonaws.com/<file_location>?X-Amz-Security-Token=<aw
            &X-Amz-Algorithm=<aws_algorithm>&X-Amz-Date=<date>&X-Amz-SignedHeaders=
            &X-Amz-Credential=<aws_credential>&X-Amz-Signature=<aws_signature>",
    "md5Hash": "<md5_hash>"
  },
  {
    "path": "<relative_path_to_file2>",
    "url": "https://<server>.amazonaws.com/<file_location2>?X-Amz-Security-Token=<a
            &X-Amz-Algorithm=<aws_algorithm>&X-Amz-Date=<date>&X-Amz-SignedHeaders=
            &X-Amz-Credential=<aws_credential>&X-Amz-Signature=<aws_signature>",
    "md5Hash": "<md5_hash>"
  }]
}
```


Exporting Contact Preferences

Use the REST API to export customers’ opt-out data to use in other SAS solutions or other components of SAS Customer Intelligence 360. Opt-out data specifies customers’ communication preferences, and this data can be imported into SAS Customer Intelligence 360 or collected through different types of events. For more information about event types, see “User-Defined Events” on page 304.

Note: Before you export data, make sure that all import jobs are complete. Check the status of upload jobs in the user interface or with the REST API, and verify that the status for import jobs is set to “IMPORTED”.

Overview

Opt-out data is stored in the data hub for each customer's identity record, and it is used by other components to control how you can contact customers with promotional offers or messages. When you export this data, it is formatted into a CSV file, which you can then download and use in other solutions. The following table contains example opt-out data for a group of customers:

Table 21.12 Example of Opt-Out Preferences

Identity Type	Identity Value	Opt-Out Type	Opt-Out Value
email_id	lkim.hill.67661.lcj@gmail.com	OPT-OUT	TRUE
email_id	burnskat@allnet.com	OPT-OUT	FALSE
email_id	lkim.hill.67661.lcj@gmail.com	Retail@Opt-Out	TRUE
email_id	joe@sas.com	HARD_BOUNCE	TRUE

When you want to export opt-out data, you need to complete these steps through the REST API:

1 Create the export descriptor.

2 Create the export file request.

3 Retrieve the download location for the opt-out data by looking up the ID of the export file request.

Create the Export Descriptor

To create an export descriptor:

1 Use this REST call:

```
POST
   https://design-<server>/SASWebMarketingMid/rest/exports
```

2 In the body of your call, make sure you complete these steps:

- Set the exportDataType to **PREFERENCE**.
- Ensure that the dataItemList is empty.

Use code similar to this example as the body for your call:

```
{
  "version": 1,
  "name": "PrefExportExample",
```

```
    "description": "Preference Export Example",
    "fieldDelimiter": ",",
    "fileType": "CSV",
    "recordLimit": 0,
    "headerRowIncluded": true,
    "exportDataType": "PREFERENCE",
    "dataItemList": []
  }
```

The response from the REST API is similar to this example:

```
{
  "version": 1,
  "id": "a2e9bcfc-ed5a-4294-a30c-6c6ed117634a",
  "name": "PrefExportExample",
  "description": "Preference Export Example",
  "fieldDelimiter": ",",
  "fileType": "CSV",
  "recordLimit": 0,
  "headerRowIncluded": true,
  "dataItemList": [],
  "createdByUserName": "sample_user",
  "modifiedByUserName": "sample_user",
  "createdTimeStamp": "2017-04-13T17:23:45Z",
  "modifiedTimeStamp": "2017-04-13T17:23:45Z",
  "links": [
    {
      "method": "GET",
      "rel": "self",
      "href": "https://design-<server>/SASWebMarketingMid/rest/
          exports/a2e9bcfc-ed5a-4294-a30c-6c6ed117634a",
      "uri": "/exports/a2e9bcfc-ed5a-4294-a30c-6c6ed117634a",
      "type": "application/vnd.sas.marketing.data.export.descriptor"
    }
  ],
  "exportDataType": "PREFERENCE"
}
```

Create an Export Request

Create an export file request using the descriptor that you created earlier.

1 Use this REST call:

```
POST https://design-<server>/SASWebMarketingMid/rest/exportFileRequests
```

2 Set the body to JSON, and include content that is similar to this example:

```
{
  "version": 1,
  "exportDescriptors": [
    "a2e9bcfc-ed5a-4294-a30c-6c6ed117634a"
  ],
  "contentName": "PerfExportExample",
  "interval": 0,
  "downloadItems": [],
```

```
  "createdByUserName": "sample_user",
  "modifiedByUserName": "sample_user",
  "startTime": "2017-08-02T00:01:40Z",
  "exportNow": true
}
```

Use these attributes:

Table 21.13 Attributes for Export Requests

Name	Description
exportDescriptors	One or more IDs for export descriptors.
contentName	The name for the export file request.
interval	(Optional) Specifies the hours of data that you want to export. For example, an interval of 1,400 exports the last 1,400 hours of data.
startTime	The start time (in UTC format) of data that you want to export. For example, a value could be **`2016-02-28T00:16:40Z`**. Note: If you use the startTime and endTime attributes, set the interval attribute to `0`.
endTime	The end time (in UTC format) for data that you want to export. For example, a value could be **`2016-02-28T00:16:40Z`**.
exportNow	(Optional) Specify **`true`** to run the export job immediately, or specify **`false`** to use the job scheduler.

The response from the REST API is similar to this example:

```
{
  "version": 1,
  "id": "71cd342a-4264-408d-ab60-0f1c5f576c3f",
  "status": "CREATED",
  "exportDescriptors": [
    "a2e9bcfc-ed5a-4294-a30c-6c6ed117634a"
  ],
  "contentName": "PerfExportExample",
  "interval": 0,
  "startTime": "1970-01-01T00:01:40Z",
  "createdByUserName": "sample_user",
  "modifiedByUserName": "sample_user",
  "links": [
    {
      "method": "GET",
      "rel": "self",
      "href": "https://design-<server>/SASWebMarketingMid/rest/
         exportFileRequests/71cd342a-4264-408d-ab60-0f1c5f576c3f",
      "uri": "/exportFileRequests/71cd342a-4264-408d-ab60-0f1c5f576c3f",
      "type": "application/vnd.sas.marketing.data.export.request"
    },
    {
      "method": "POST",
      "rel": "status",
```

```
      "href": "https://design-<server>/SASWebMarketingMid/rest/
         exportFileRequests/71cd342a-4264-408d-ab60-0f1c5f576c3f/status?_method=PATCH",
      "uri": "/exportFileRequests/71cd342a-4264-408d-ab60-0f1c5f576c3f/
         status?_method=PATCH",
      "type": "application/vnd.sas.marketing.data.export.request"
    }
  ],
  "createdTimeStamp": "2017-04-13T17:32:46Z",
  "modifiedTimeStamp": "2017-04-13T17:32:46Z"
}
```


Retrieve the Download Location

Use a GET call with the ID of the export request that you created:

```
GET https://design-<server>/SASWebMarketingMid/rest/exportFileRequests/
   <export_request_ID>
```

When the REST API returns the status, it includes a download location for the files. The response is similar to this example:


```
{
  "version": 1,
  "id": "71cd342a-4264-408d-ab60-0f1c5f576c3f",
  "status": "EXPORTED",
  "exportDescriptors": [
    "a2e9bcfc-ed5a-4294-a30c-6c6ed117634a"
  ],
  "contentName": "PerfExportExample",
  "interval": 0,
  "startTime": "1970-01-01T00:01:40Z",
  "downloadItems": [
    {
      "path": "exports/15250/71cd342a-4264-408d-ab60-0f1c5f576c3f/
         PerfExportExample_0000_part_00",
      "url": "https://<download_URL>"
    },
    {
      "path": "exports/15250/71cd342a-4264-408d-ab60-0f1c5f576c3f/
         PerfExportExample_0001_part_00",
      "url": "https://<download_URL>",
      "md5Hash": "59adb24ef3cdbe0297f05b395827453f-1"
    },
    {
      "path": "exports/15250/71cd342a-4264-408d-ab60-0f1c5f576c3f/
         PerfExportExample_header_6411_part_00",
      "url": "https://<download_URL>",
      "md5Hash": "d02151f2b8e768b48116de0cd7ebfe1a-1"
    }
  ],
  "createdByUserName": "sample_user",
  "modifiedByUserName": "sample_user",
  "links": [
    {
      "method": "GET",
```

```
      "rel": "self",
      "href": "http://<server>/SASWebMarketingMid/rest/
         exportFileRequests/71cd342a-4264-408d-ab60-0f1c5f576c3f",
      "uri": "/exportFileRequests/71cd342a-4264-408d-ab60-0f1c5f576c3f",
      "type": "application/vnd.sas.marketing.data.export.request"
    },
    {
      "method": "POST",
      "rel": "status",
      "href": "http://<server>/SASWebMarketingMid/rest/
         exportFileRequests/71cd342a-4264-408d-ab60-0f1c5f576c3f/status?_method=PATCH",
      "uri": "/exportFileRequests/71cd342a-4264-408d-ab60-0f1c5f576c3f/
         status?_method=PATCH",
      "type": "application/vnd.sas.marketing.data.export.request"
    }
  ],
  "createdTimeStamp": "2017-04-13T17:32:46Z",
  "modifiedTimeStamp": "2017-04-13T17:32:49Z"
}
```

22

Deleting Customer Data

Deleting Customer Identity Data

Use the customerJobs endpoint of the external API gateway to delete identity data from your system. When you delete identity data, the system performs these actions:

- other identity types (such as customer ID and login ID) that are associated with the identity are deleted
- email imprints that are associated with those identities are deleted
- the identity ID (which is the base ID that is created by SAS Customer Intelligence 360) still exists, but it is effectively orphaned and not connected to any information

The main purpose of this API is to provide a way for you to delete all identity data for individuals as part of a GDPR request. For more information about GDPR support, see “About GDPR Support in SAS Customer Intelligence 360”.

To submit a request to delete identity data:

1. Set up access to the external API gateway on page 221.

2. Send a POST call to the customerJobs endpoint to delete data. The call is similar to this example:

   ```
   POST https://extapigwservice-<server>/marketingGateway/customerJobs
   ```

   Note: Be sure to use the JWT as the authentication token when you submit the request.

   In the body of the call, define the delete request as a JSON object:

   ```
   {
     "jobType": "GDPR_DELETE",
     "identityType": "subject_id",
     "identityList": [
       "12343455"
     ]
   }
   ```

   The delete request contains these members:

Table 22.1 Members of the Customer Delete Request

<table>
<tr><th>Name</th><th>Type</th><th>Description</th></tr>
<tr><td>jobType</td><td>String</td><td>The job type. Set this value to GDPR_DELETE.</td></tr>
<tr><td>identityType</td><td>String</td><td>The identity type that you are using to search the database. Use one of these values:

customer_id
device_id
identity_id
When you import data with an identity ID, no identity processing is done. Imported data is associated directly with existing customer records.
For an example, see “Sample Data Descriptor Using Identity IDs”.
Note: To use this identityType value, the import descriptor’s type must be customer.
login_id
subject_id
visitor_id
</td></tr>
<tr><td>identityList</td><td>List</td><td>The actual values of customer identities to delete. The value should match a real customer identity in the system.
For example, if you specify a subject ID, data that is associated with the login ID and customer ID is also deleted for that customer.
Follow these guidelines:

Values must be lowercase.
Values must match the type that is specified for identityType.

The format for this value is similar to this example:
<code>["subject_id1","subject_id2","subject_id3"]</code>
In the output data, a blank row is returned if there is no data associated with that ID.</td></tr>
</table>

The response to the POST call contains the request ID for the delete job.

3 Use the request ID to view the request’s status. Submit a GET call similar to this example:

```
GET https://extapigwservice-<server>/marketingGateway/customerJobs?importFileReques
```

After the request is processed, all data and customer attributes for the specified identity types are deleted.

PART 5

Planning

23

Creating Plans

About Plans

Marketing departments that use SAS 360 Plan can operate more efficiently by integrating and managing end-to-end marketing processes.

- Plan strategically and collaboratively to ensure that your marketing plan aligns with your organization's objectives. Create and approve plans in a centralized repository, so that you can easily manage and retrieve them.
- Manage finances with an integrated budget that tracks expenses and automatically updates your plans and calendars.
- Use an integrated calendar to schedule and track timing of your plans and tasks for marketing efforts.
- Use workflows to manage assignments and get real-time visibility into project timelines. You can customize the available workflow templates to match your business needs.

By combining SAS 360 Plan with other licenses, you can integrate planning, execution, and monitoring of your marketing objectives. Integration with other licenses gives you the information to ensure that your objectives are on track or enable you to quickly change your strategy when necessary.

About Planning Items, Levels, and Marketing Hierarchies

About Planning Items

Planning items provide a way to group and track information that you need for marketing operations. A *planning item* is a collection of information and resources about the associated marketing activities at various levels. Planning items might contain the following information and resources: budgets, expenses (commitments and invoices), vendors, cost centers, financial accounts, and so on.

Planning items are associated with levels in a marketing hierarchy. The type of planning item that you create is determined by its predefined level in the marketing hierarchy. Planning items have parent-child relationships, which are based on the association between the planning item and its level in the marketing hierarchy. If a program is created at the parent level in a hierarchy that has the levels plan, program, and campaign, the program can be associated with one or more campaigns that are created at the child level.

Use planning items to track, approve, and monitor the performance of your marketing activities. For example, to track and monitor marketing campaign performance, you can create a planning item for every campaign. Depending on the marketing hierarchy that is customized for your organization, you can choose the type of planning item that you want to create. In the default marketing hierarchy, you select **Campaign** as the level for the planning item.

Planning items might also be associated with resources such as messages, tasks, and activities. If you have a license for SAS 360 Engage: Digital, SAS 360 Engage: Direct, or SAS 360 Engage: Email, you can associate planning items with the tasks or activities that you create in these modules. For example, if you create an email task, you can create a planning item that is associated with this task. When planning items are associated with tasks or activities, authorized users can create, track, and monitor marketing activities from planning through execution.

About Levels

A *level* is a collection of information about a specific marketing endeavor such as a campaign. Levels are used to organize the marketing hierarchy and to categorize planning items. Each level has a name, description, avatar (icon), and settings to enable approvals and initiate workflows.

Based on your organization’s needs, an administrator can customize and define up to 10 levels in a marketing hierarchy. For example, some organizations choose to work with two levels, and others choose to work with four levels.

By default, SAS 360 Plan provides three marketing levels: Plan, Program, and Campaign. You can use the default levels or create levels based on the needs of your marketing organization. For more information, see "Managing Marketing Hierarchies" on page 110.

About Marketing Hierarchies

A *marketing hierarchy* defines the different levels of marketing activities and represents the relationships between the activities. Levels are used to organize the marketing hierarchy and to categorize the planning items. When two or more levels are used, the order of the levels establishes a parent-child relationship between the planning items that are associated with these levels.

To create planning items, you must have at least one marketing hierarchy configuration. The marketing hierarchy must contain at least one level.

You can add the planning items based on the marketing hierarchy that is configured for your organization and the levels that are available to you. The planning items at the top level of the marketing hierarchy can influence the content of the planning items at the lower levels.

An example is a customized marketing hierarchy for your organization that contains Campaigns as the parent planning item and Plans as the child planning item. In the marketing hierarchy that you create, you cannot add Campaigns under a Plan. You must add a Campaign at the parent level and a Plan at the child level.

The default marketing hierarchy is arranged in this order:

- Level 1 is Plan. In a plan, you can add or associate programs, tasks, activities, and messages.
- Level 2 is Program. Multiple programs can be part of the same plan. In a program, you can add or associate campaigns, tasks, activities, and messages.
- Level 3 is Campaign. In a campaign, you can add or associate tasks, activities, and messages.

Note: The levels that are available to you might differ from the default hierarchy, if your administrator customized the hierarchy.

Access to Planning Items

What features you can access in Plans and the type of access that you have depends on these factors:

- the type of license that you have. A license for SAS 360 Plan gives you access to **Plans** and can be combined with other licenses to give you access to more parts of the product. Alternatively, a person with a license for SAS 360 Engage: Digital might still be able to view Plans, but not make changes to plan items. In another example, a user without a SAS 360 Plan license might still be able to enter planning metadata in a task or activity.
- the roles that are assigned to you by your administrator in SAS Customer Intelligence 360. Your roles affect what you can view, create, edit, comment on, and publish. For example, tabs such as **Financials**, **Approvals**, and **Workflows**

are available depending on the roles assigned to you. For a description of roles, see “List of Roles” on page 78.

Creating a Planning Item

You can create one planning item at a time, or you can create multiple planning items by uploading a Microsoft Excel template. To create multiple planning items at one time, see “Creating and Updating Multiple Planning Items” on page 271.

1 From the navigation bar, click .

2 Click .

3 Select the type of planning item that you want to create.

4 Fill in the information about the standard and custom properties on the **Details** tab.

The section for Standard properties provides the following information that uniquely identifies the planning item:

- In the **Name** field, add a unique name. You can also add a description.
- The value for the **Code** field might be automatically generated or editable, depending on the settings that are configured for your environment. This value must be unique to be valid. Valid characters for codes are alphanumeric characters, multi-byte characters, numerals, underscores, hyphens, and periods.

  An item can be identified by its code for activities such as auditing and reporting. When an item is imported or migrated to SAS Customer Intelligence 360, the existing code value for the item is retained.

  TIP If an existing code is displayed for the new planning item, click to automatically generate a unique code.

- **Type** indicates the level of the planning item in the marketing hierarchy. This field is not editable.
- **Path** indicates the source path for the planning item. This field is not editable.
- In the **Tags** field, add one or more search tags that describe the planning item.
- The value for the **Currency** field is automatically populated, depending on the business unit and currency settings that are configured for your environment.
- Select the **Planned start date** and **Planned end date** for the planning item.
- In the **Category** field, select a category for the planning item.

  Note: When you select a category, if custom properties settings are configured for planning levels, planning tasks, and planning activities, the custom properties section displays only the attribute groups (and custom properties) that are related to that category and enabled in that marketing hierarchy. For more information, see "Configuring Custom Properties" on page 111.

Custom properties provide additional business information that is related to the planning item. Custom properties are specifically configured to your organizational context and needs. In the **Custom** properties section, enter the information for the custom fields that are configured for your organization. For more information, see "Custom Properties" on page 142.

5 Click so that you can continue creating your planning item.

6 Click to export the standard and custom properties for the planning item to a PDF file. Use the options in the PDF reader to download and generate a digital or printed copy of the PDF file.

By default, the status of the new planning item is Planning.

After you create and save your planning item, navigate to the remaining tabs to add more information, levels, tasks, activities, or messages.

Note: Some tabs might not be available. The tabs that you see depend on the role that your administrator added to your account.

- Add messages to this planning item on the **Details** ⇨ **Messages** tab.
- Add levels or related items, such as tasks and activities on the **Relationships** tab.
- Add financial information, such as budgets, commitments, invoices, and cost centers on the **Financials** tab.
- Add approvals for this planning item on the **Approvals** tab.
- Add and initiate workflow tasks for this planning item on the **Workflows** tab.

Adding Levels and Related Items

About Adding Levels and Related Items

To create a marketing hierarchy, associate other planning items, activities, or tasks with a planning item. Depending on the default or custom marketing hierarchy that is configured for your organization, you can add planning items up to 10 levels.

For more information, see "About Marketing Hierarchies" on page 258.

The default marketing hierarchy contains three levels: Plan, Program, and Campaign. Plan is the parent planning item that you create within the default marketing hierarchy. You can add or associate the following planning items with a plan.

Add Programs or Campaigns

You can add an existing planning item to the marketing hierarchy, or create a planning item within this hierarchy.

- To add an existing program or campaign, on the **Relationships** tab, click **Add Program** or **Add Campaign**. Select the planning item and click **OK**.

  Note: The list of items that are displayed depends on the settings of the business unit and currency. If the business unit setting is enabled, all of the items that are created with the business unit are displayed. If the business unit setting is not enabled, all of the items that are created with the currency are displayed. If the settings for business units are changed, you cannot associate any existing items with another planning item.

- To create a planning item, click **New Program** in the Add Program window, or click **New Campaign** in the Add Campaign window.

  TIP The planned start and end dates are the same dates as the parent planning item. You can change these dates.

Add Activities

You can associate activities with a planning item. You can also add planning attributes and budgets to the activities. By associating an existing activity with a planning item, you can group information that is relevant to specific marketing goals for your planning item.

For more information, see "About Activities" on page 745.

Note: The SAS Customer Intelligence 360 items that are available to you depends on the product licenses that you have purchased.

Add Tasks

You can associate different types of tasks with a planning item. You can add planning attributes and budgets to the tasks. By associating an existing task with a planning item, you can group information that is relevant to specific marketing goals for your planning item.

For more information, see "Types of Tasks" on page 986.

Note: The SAS Customer Intelligence 360 items that are available to you depends on the type of product licenses that you have and the roles that are assigned to you by your administrator.

View Marketing Hierarchy

You can view the hierarchy of the planning item. In the **Table** view for **Plans**, click the planning item to view its details. You can also perform actions such as remove, delete, copy, rename, and export to Excel. Use the breadcrumbs that are available at the top left of the window to return to the previous planning item.

Associating Messages with a Planning Item

About Messages and Planning Items

You can associate a message, which might contain creatives, to a planning item. When you associate a message with the planning item, the creatives in that message become available to the planning item and all of the parent planning items.

You can associate one or more messages to a planning item, regardless of the status of the message. By associating messages to a planning item, you can group information that is relevant to specific marketing goals for which you are creating a planning item. For more information, see “About Messages” on page 437.

Note: The items from SAS Customer Intelligence 360 that are available to you depends on the type of product licenses that you have and the roles that are assigned to you. For more information, contact your administrator

Associate Messages with a Planning Item

To associate a message to a planning item:

1 On the **Details** tab, click the **Messages** tab.

2 Click **Add Message**. The **Select Message** screen displays a list of messages. To view the messages that are associated with a parent item, select the **Associated with Parent** check box.

3 Select the messages to be associated with the planning item, and then click **OK**. These messages are associated with all the planning items located in the hierarchy above the planning item.

4 To add more messages click **+**.

View Messages Associated with a Planning Item

To view the associated messages, on the **Details** tab of a planning item, click **Messages**.

In the list of associated messages, a link icon is shown next to the message that is associated with a task. The association of this message and the task cannot be removed:

- When you view or open the message that is associated to a planning item, you can see the most recent status of the message that is saved in the system.
- If a message that is associated with a task is replaced with another message in the application, the new message is shown with the association icon at the task level. The previous message is shown for the planning item without an association icon.
- If the association of a message to a task is removed from the application, this message is not shown at the task level. The message is available for a planning item without the association icon.
- If a new message is associated with a task that is already associated with a planning item, the new message is shown with the association icon at the task level and in the parent hierarchy.
- If a message that is associated with a planning item is deleted from the application, the message is removed from the planning item and the parent hierarchy.

View Message Details

1. On the **Details** tab, click the **Messages** tab.
2. Click $\boxed{i}$ next to the message to view and remove the associations. If the message is not directly associated with the planning item, only the association with the currently selected planning item is removed.
3. To view the messages that are directly associated with the planning items, use the toggle in the upper right corner of the screen.
4. You can view the message details by clicking the message name. Use the breadcrumbs available in the upper left corner of the screen to return to the planning item.

Remove Messages from a Planning Item

1. On the **Properties** tab, click the **Messages** tab.

2 Select the messages that you want to remove.

3 Click the appropriate icon and confirm removal.

The messages are removed from the child planning items but not from the parent planning item. The removed messages are available in the message list for association.

Adding Financial Information to a Planning Item

Allocating Budgets

About Budgets

A *budget* is a financial plan for a given planning item to estimate revenues and expenditures for a financial year. You can allocate a maximum amount of funding for a planning item.

In SAS Customer Intelligence 360 Plans, you can track the budgeted amount, commitments to vendors, and the expenses for all the planning items. You can also modify the budget in case of any shortfall, by transferring funds from other allocations.

Information about the amount that is available for a planning item is displayed on the **Budget** page. Information about the expenditures related to the planning item is displayed on the **Expenses** page.

View Information about the Budget

On the **Financials** tab for a planning item, on the **Budget** page, you can view the following information:

Budget Amount
: is available for this planning item and any items at the associated lower level.

Allocated Budget
: includes the Level Amount and the Rolled-up Budget.

Level Amount
: is available for the planning item at this level. This amount is not available for the lower-level items.

Rolled-up Budget
: the sum of the budget amounts that are directly associated with the lower-level planning items.

Available Budget
: the remaining amount that is available for allocation to this planning item or to associated items at the lower level. Available Budget can be a negative amount if you allocate more than your Budget Amount.

> **TIP** To view the formula for the Available Budget amount, click .

The breadcrumbs at the top of the **Budget** page shows the level of the planning item that you are currently viewing.

Allocate the Budget

On the **Budget** page, enter the following information:

1. In the **Budget Amount** section, enter the total budget amount for the planning item. You can allocate amounts to items at the associated lower level, which you added in the marketing hierarchy on the **Relationships** tab.
2. In the **Level Amount** field, enter the amount that is available to manage commitments and invoices for the planning item. For example, if the level name is Plan, the Level Amount is the budget for Plan. This amount is not available for lower-level items.

   If you want to allocate the entire Budget Amount for this level, activate the switch for **Same as Budget Amount.**

View Rolled-Up Budget

To view the budget that is rolled up from the lower levels in the marketing hierarchy, on the Financials tab, see Rolled-up Budget Allocation. You can view the planned budgets for each of the immediate lower-level items. Click the planning item to view the financial details of the lower-level items. Use the breadcrumbs at the top left of the screen to return to the previous planning item.

Bulk Edit of Budgets

A bulk edit of budgets enables you to reallocate budgets for a set of programs, activities, and tasks. Unused budgets can be reallocated from one planning item to another or moved to an activity that is running low on funds.

1. Select the planning item to edit its budget amount.
2. Click and select .
3. The **Edit Budget** window displays the budgets for all of the planning items in the entire marketing hierarchy. In this window, you can edit the budgets for each planning item all at once.
4. Click **Apply**.

Tracking Expenses

About Expenses

Expense is the money spent while executing the activities associated with a planning item. You need to track your expenses to control your finances and check whether the budgeted amount has been exceeded.

In SAS Customer Intelligence 360, you can track the expenses at every planning level on the **Financials** tab in the **Expenses** section.

View Information about Expenses

On the **Financials** tab for a planning item, on the **Expenses** page, you can view the following information:

Level Amount
: the amount that is available for the planning item at this level. This amount is not available for lower-level items.

Level Expenses
: the sum of the Outstanding Commitments and Invoices for the planning item at this level.

Outstanding Commitments
: the amount that has been entered for all of the planning item commitments but has not been assigned to an invoice.

Invoices
: the sum of all the invoiced amounts that are associated with the planning item.

> **TIP** To view the formula for the Invoices amount, click $f_{(\cdot)}$.

Available to Spend
: the remaining amount of the budget for this level after expenses are deducted.

> **TIP** To view the formula for the Available to Spend amount, click $f_{(\cdot)}$.

Track Expenses

On the **Expenses** page, you can track expenses for a planning item by adding commitments and invoices.

Commitments are monetary amounts that you commit to vendors for services rendered to your organization. Each planning item can have several commitments. When you add a commitment, you can also distribute the commitment amount to the available cost centers that you select for the planning item. For more information, see “Add a Commitment” on page 267.

Invoices are submitted by the vendors for services rendered to your organization. You can submit several invoices for each planning item. When you add an invoice, you can also distribute the invoice amount to the available cost centers that you select for the planning item. For more information, see "Add an Invoice" on page 268.

You can submit a direct invoice that is not associated with any commitment, or you can associate an invoice with a commitment that you added. For more information, see "Associate Invoices with a Commitment" on page 268.

Add a Commitment

Complete these actions:

1. In the **Commitments** section, click .
2. Enter the commitment number, name, and description.
3. For the **Date created**, select the date on which the commitment is created.
4. For the **Payment date**, select the date on which the payment should be made.
5. Click **Vendor Details** and select a **Vendor**.

   The currency of the vendor is selected by default.
6. Enter the **Amount in vendor currency**. This is the commitment amount in the currency selected for the vendor. This field is visible only when the vendor currency and the planning currency are different.
7. Enter the **Amount in planning currency**. This amount is in the currency that is selected while creating a planning item. This currency and amount are used in all the calculations.
8. You can distribute the commitment amount to the appropriate cost centers.

   Note: You can add cost centers only if the setting for Cost Centers is enabled. For more information, see "Manage Budget Settings" on page 109.

   Click **Cost Center Details** and click + to select a cost center.
9. The **Select Cost Centers** window displays the cost centers that are associated with the planning item. You can search for a cost center, and you can activate the switch for **Show all the cost centers**. Activating this switch displays all of the cost centers that are available in the system. Select one or more cost centers that you want to add.
10. In the Cost Center Details table, in the Amount column, add the amounts that you want to assign to each cost center. To view all of the cost center columns, activate the switch for **Show more cost center columns**. If the setting for Cost Centers is enabled, you can distribute the commitment amount to the cost centers. If the setting for Restrict Overbudgeting is enabled, the total amount that is distributed to the cost centers cannot exceed the commitment amount.
11. By default, the **Status** of the commitment is new.
12. Click **Save** to save the commitment or click **Save and add more** to save the commitment and add more commitments.

You can add invoices to a commitment. For more information, see Associate Invoices with a Commitment on page 268.

Add an Invoice

Complete these actions:

1 Click in the **Invoices** section.

2 Enter the invoice number, name, and description.

3 For **Date created**, select the date on which the invoice is created.

4 For **Payment date**, select the date on which the invoice is paid.

5 Select the **Vendor** that submitted the invoice.

The currency of the vendor is selected by default.

6 Enter invoice details in the **Amount Details** section. Enter line item details such as name, description, quantity, rate in the vendor currency after you select the vendor, and the amount in the currency of the planning item. The amount in the vendor currency is calculated automatically after you enter the quantity and the rate. If the currency of the vendor is the same as the currency of the planning item, the amount is displayed in that currency. If the rates change, you can override the amount in the planning currency and the vendor currency. To add line items, click +.

7 You can distribute the invoice amount to the appropriate cost centers.

Note: You can add cost centers only if the setting for Cost Centers is enabled. For more information, see "Manage Budget Settings" on page 109.

Click **Cost Center Details** and click + to select a cost center.

8 The **Select Cost Centers** window displays the cost centers that are associated with the planning item. You can search for a cost center, and you can activate the switch for **Show all the cost centers**. Activating this switch displays all of the cost centers that are available in the system. Select one or more cost centers that you want to add.

9 In the Cost Center Details table, in the Amount column, add the amounts that you want to assign to each cost center. To view all of the cost center columns, activate the switch for **Show more cost center columns**. If the setting for Cost Centers is enabled, you can distribute the invoice amount to the cost centers. If the setting for Restrict Overbudgeting is enabled, the total amount that is distributed to the cost centers cannot exceed the invoice amount.

10 Click **Save** to save the invoice or click **Save and Add More** to save the invoice and add more invoices.

Associate Invoices with a Commitment

To add existing invoices to a commitment or to create an invoice:

1 Click on the commitment and view the commitment details.

2 On the **Invoices** tab, click **Add Invoices**. Select from the existing invoices and click **OK**. To add invoices, click **New Invoice**.

3 To add more invoices, click + on the **Invoices** tab.

Note: When you associate a direct invoice with a commitment, the cost centers that were listed in the invoice but not listed in the commitment, are added to the commitment.

Remove Invoices from a Commitment

1 Click the commitment and view the commitment details.

2 On the **Invoices** tab, click **Select** and select an invoice.

3 Click ⊘ and confirm the removal.

Reconcile Invoices

You can reconcile invoices to reflect the actual amount that is adjusted for payment against an invoice. To reconcile an invoice:

1 In the **Invoices** section, select an invoice.

2 Click .

3 In the **Invoice Reconciliation** window, select the payment date and enter the reconciled amount for the invoice.

4 In the Invoice Details table, you can distribute the reconciled amount to the appropriate cost centers.

   Select the invoice for which you want to add a cost center. At the top of the Invoice Details table, click **+** to add a cost center.

   Note: You can add cost centers only if the setting for Cost Centers is enabled. For more information, see "Manage Budget Settings" on page 109.

5 The **Select Cost Centers** window displays the cost centers that are associated with the planning item. You can search for a cost center, and you can activate the switch for **Show all the cost centers**. Activating this switch displays all of the cost centers that are available in the system. Select one or more cost centers that you want to add and click **Save**.

6 In the Invoice Details table, in the Reconcile Amount column, add or edit the reconciled amount for that cost center.

   Note: The total amount that you distribute to the cost centers should match the reconcile amount that you entered in the table in step 3.

7 Click **Save**.

You can also reconcile an invoice that is associated with a commitment, add one or more cost centers, and distribute the reconciled amount to the appropriate cost centers.

Close Commitments

The commitments can be marked closed if these tasks are performed:

- all invoices against the commitment are reconciled
- there are no invoices associated with the commitment

To close the commitments:

1 Click the commitment and view the commitment details.

2 On the **Details** tab, click the **Close commitment** link.

3 Confirm the operation in the window.

4 The status of the commitment changes to be closed.

Note: A closed commitment cannot be reopened. When the commitment is closed, the balance commitment amount is released to the cost center or the planning item. In the case of a negative balance commitment amount, the amount is deducted from the cost center or the planning item.

Budgeting with Cost Centers

About Budgeting with Cost Centers

A *cost center* is an organizational unit to which costs are allocated for accounting purposes. Cost centers are used to track expenses and determine allocation of direct and indirect costs. In SAS 360 Plan you can use cost centers for budgeting and tracking of expenses.

You can distribute the budget for a planning item to the selected cost centers that are available in the system.

Note: You can add cost centers only if the setting for cost centers is enabled. For more information, see “Manage Budget Settings” on page 109.

View Information about the Cost Center Distribution

On the **Financials** tab for a planning item, on the **Cost Center Distribution** page, you can view the following information:

Level Amount
: the amount that is available for the planning item at this level.

Total Cost Centers Amount
: the sum of the amounts that are distributed to the cost centers, which are associated with this planning item.

Remaining Amount
: the amount that is available for distribution to the cost centers.

> **TIP** To view the formula for Remaining Amount, click $f_{(\bullet)}$.

The Cost Center Distribution table lists the cost centers that you added and other relevant information.

Distribute Budget to Cost Centers

To distribute the budget for a planning item to the cost centers:

1 Navigate to **Financials** ⇨ **Cost Center Distribution**.

2 To add a cost center, click ✚.

3 Select each cost center that you want to add and click **OK**.

4 Enter the amount that you want to distribute to each cost center in the Distribution column. The total amount distributed to the cost centers for a level should not exceed the budget amount for that level.

   Note: If the setting for Restrict Overbudgeting is enabled, a message is displayed if the Cost Center Distribution amount exceeds the Level Amount.

Delete a Cost Center

1 Navigate to **Financials** ⇨ **Cost Center Distribution** of a planning item.

2 Click a cost center row and click 🗑.

3 Confirm the deletion.

Note: The cost center is deleted from all the commitments and invoices that are associated with the planning item.

Creating and Updating Multiple Planning Items

About Batch Updates of Planning Items

You can create or update a batch of planning items and their hierarchy by using a Microsoft Excel template. The template is a Microsoft Excel file that contains worksheets, which are generated by the system. Each worksheet corresponds to a level in the marketing hierarchy. For example, if your hierarchy contains Plans, Programs, and Activities, then the template contains worksheets for Plans, Programs, and Activities. Download the template to create the planning items, and then import the planning items to Microsoft Excel. The Excel spreadsheet contains the planning information, custom attributes, budget, and expenses.

Create or Update a Batch of Planning Items

Complete these actions:

1 From the navigation bar of the planning item list screen, click ⋮ and select **Download template**. Complete the downloaded template with the planning and budget information for the planning items.

Note: Changing the worksheet names or adding worksheets might invalidate the template.

2 Select **Import Excel**, and then select your spreadsheet. Click **Yes**.

Note: If the spreadsheet contains date and time values, the values must match the `yyyy-MM-dd` format for the date attribute, and `yyyy-MM-dd'T'HH:mm:ss'Z'` format for the datetime attribute.

Export a Planning Item to Microsoft Excel

There are three ways to export selected planning items.

On the planning item list screen:

1 Select the planning items that you want to export.

Note: Tasks and activities are associated with planning items through planning properties. As a result, only those activities and tasks that contain planning properties can be exported.

2 Click ⋮ and select **Export to Excel**. You can export only one planning item at a time. All the details associated with the planning item are exported to an Excel spreadsheet.

On the planning item details screen:

1 Navigate to the **Details** tab.

2 Click ⋮ and select **Export to Excel**.

On the planning item details screen:

1 Navigate to the **Relationships** tab.

2 Select the planning items that you want to export.

3 Click . All the selected items are exported.

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Working with Plans

Managing Planning Items

Edit a Planning Item

1. Click the name of the planning item in the Plans list window.
2. On the planning item details screen, edit the details.
3. Click to save the changes.

If the settings for business units are changed, you can edit the planning item details, but you cannot change the business unit or currency.

If the administrator changes the currency of a planning item, you need to change the currency of the planning item to a valid currency. If the currency is not changed to a valid currency, then you cannot add any more planning items to the hierarchy. The details of the planning item can be edited.

Note: When you edit a planning item, ensure that the start date of the child item is within range of the start and end dates of the parent planning item.

Copy a Planning Item

There are two ways to copy a planning item.

In the Plans list window:

1 Select the item to be copied.

2 Click ⋮ and select .

3 Enter a unique planning item number and name for the copy. The default name is *item name* 1. This action copies only the planning item details, not the items that are associated with the planning item.

In the context of the planning item:

1 Click ⋮ and select **Save as**.

2 Enter a unique planning item number and name for the copy. The default name is *item name* 1. This action copies the planning item details and associates the planning item with the parent item. The items that are associated with the planning item are not copied.

Note: If the settings for business units are changed, you cannot make a copy of the existing planning items.

Rename a Planning Item

On the Plans list screen:

1 Select the item to be renamed.

2 Click ⋮ and select **Rename**.

3 Enter a unique name for the item.

4 Click **Save**.

Comment on a Planning Item

Post a Comment

1. Click in the upper right corner of the planning item screen.
2. Create a topic and enter a comment to begin a forum.
3. (Optional) Attach a file to the topic.
4. Click **Post**.

Manage Comments

You can perform the following actions on an existing comment:

- Click to edit the comment.
- Click to delete the comment.
- Respond to the comment.

Delete a Planning Item

There are two ways to delete a planning item.

On the Plans list screen:

1. Select the items to be deleted.
2. Click .
3. Confirm the deletion.

In the context of the planning item:

1. Navigate to the **Relationships** tab of the planning item.
2. Select the items to be deleted.
3. Click .
4. Confirm the deletion.

Activities and tasks are not deleted. The associated activities and tasks are removed from the planning item. Only the selected planning items and the associated planning items are deleted.

Switch between Planning Mode and Design Mode

When a task or an activity is associated to a planning item, you can work on the task or activity in the planning mode or in the design mode.

Tasks and activities are created in the Design mode. In the Design mode, you can specify the information that you need to create and deliver content to your customers through the tasks and activities.

Tasks and activities are associated to a planning item to enable you to group all of the information that is relevant to a marketing goal. In the Planning mode, you can specify the information that you need to plan and execute the tasks and activities, and also to manage budgets and track expenses.

In a task or an activity that is associated to a planning item, you can easily switch between the planning mode and design mode.

- To edit an activity, open the associated activity from the planning item. On the **Details** tab click to switch to the design mode. Click to return to the planning mode.
- To edit a task, open the associated task from the planning item. On the **Details** tab, click to switch to the design mode. You can edit the task and click to return to the planning mode.

Approving Planning Items

Submit an Approval Request

Before you start a marketing activity, request approval of the planning item from your stakeholders.

1. Click the **Approvals** tab of the planning item to start an approval cycle.
2. On the **Approval Cycles** tab, click **Submit for Approval**.
3. Enter a name for the approval.
4. Select the type of review. You can select a sequential review or a simultaneous review by switching the toggle. In a sequential review, an approver reviews the planning item, then a second approver reviews it, and so on. In a simultaneous review, all approvers review the planning item at the same time.
5. A list of the preselected approvers is displayed. To add more approvers, click + and select the approvers. To delete a preselected approver, click .
6. For each approver, enter the duration in days. The duration is the time within which the approver needs to complete the review. The default duration can be

changed. The due date is calculated as soon as the duration for each approver is specified.

7 Click **Add** to provide instructions to each approver individually.

8 Click **Send**.

To provide instructions for an approval cycle, click and enter the instructions. The status of the approval changes from **Planning** to **Pending approval**. After all approvers submit their comments, the status changes to **Approved** if all the approvers approve and to **Rejected** if at least one of the approvers rejects the approval. To cancel a pending approval, click .

Skip or Cancel an Approver

After initiating an approval cycle, you can skip or cancel an approver. In a sequential review, if an approver is skipped or canceled, the next approver is selected by default. You can skip or cancel an approver only when the status for that approver is **Pending** or **Not initiated**. In a simultaneous review, you can skip or cancel an approver only when the status of that approver is **Pending**.

1 Click . This icon appears next to the name of the approver.

2 Enter the reason for skipping or canceling the approver, and then click **Yes**.

3 The status of the approver changes to **Removed**.

Approve the Planning items

The planning items that you submit for approval can be reviewed by the approvers in these ways:

1 From the **Approvals** tab of the planning item:

   a Navigate to the **Pending My Approval** tab.

   b Click **Update**.

   c Add your comments and select **Approve** or **Reject**.

   d Click **Save**.

2 From the navigation bar, click **My Workflows Tasks**:

   a A list of the workflow and approval tasks assigned to you is displayed.

   b Select **Approve** or **Reject** and add your comments.

   c Click **Submit**.

3 Click the link that you receive in the email that notifies you about the task, and then complete the task.

After the approvers finish their review, the status of each approver is updated and the status of the approval changes to **Approved** or **Rejected**. The status of the planning item changes to **Approved** only after all the approvers submit their approval.

View Approval History

On the **Approvals** tab, the **View History** section is available after one approval cycle is initiated and completed. Click the date of the history to view the details.

Viewing Planning Items on a Calendar

View Planning Items in the Calendar View

You can view the schedule for the planning items on the calendar, based on the information that you specified for each planning item. By default, **Plans** displays all of the items in the **Table** view. Click to see all of the items in the **Calendar** view.

The items are displayed in different color variants, depending on the attribute that is selected for color configuration. For planning items, the type attribute is configured by default. Click to view the color legend for each of the calendar items. For more information, see "Configure Colors by Attribute" on page 119.

To view more information about a planning object in the **Month**, **Week**, or **Day** view, position your mouse pointer on the item. The tooltip displays information about the item, which includes the name of the planning item, and these fields and their values:

- **Planned start date**
- **Planned end date**
- **Status**
- **Planned**
- **Available budget**

Note: The listed fields display variable values in the tooltip for each item, depending on the information that you entered when you created the items.

View the Planned Schedule for a Day, Week, or Month

You can view the planned schedule for one or more items for a specified day, week, or month. By default, the **Calendar** view for **Plans** displays items in the **Month** view, and the current date is selected. Click **Day**, **Week**, or **Month** to see the items that occur on the selected date, in the selected week, and in the selected month.

To change the selected day, click **Week** or **Month** and select a date. Use **<** and **>** to navigate between consecutive days, weeks, and months. To return to the current date, click **Go to Today**.

View the Planned Schedule for All Items

In the **Calendar** view for **Plans**, you can view items such as **Plans**, **Programs**, **Campaigns**, **Activities**, and **Tasks**.

Note: The items at various levels in the planning hierarchy are defined and configured based on the unique requirements of your organization.

Click an item to open it. In the **Week** and **Month** views, on a selected date, you can see only a few items due to limitations on the size and resolution of the screen. To view all of the items on a selected date, click **+ (n) more**. All of the items for the date are displayed in the **Day** view.

Search and Filter Planning Items

Find Specific Items

On the **Plans** page, by default the **Table** view and the **Calendar** view display all of the items for a selected time period. To find an item by name, by status, or by the user who modified the item, enter the relevant keywords in the search box.

To filter items and refine your search, click . You can filter items by **Type**, **Level**, **Association**, **Status**, **Business Unit**, **Currency**, **Planned Start Date**, **Planned End Date**, **Last Modified** date, and **Modified By** user name.

Find Items in a Specific Time Period

When you switch from the **Table** view to the **Calendar** view for **Plans**, by default the items that occur in the current month are displayed in the **Month** view. You can use the **Planned Start Date** and **Planned End Date** fields to filter items that occur during the specified time period. You can also use the **Last Modified** field to filter items that were modified during the specified time period.

Click and in the **Refine Search** pane, enter date ranges for **Planned Start Date**, **Planned End Date**, or **Last Modified** fields. Depending on the priority that is defined for these date fields in the calendar definition, the **Calendar** view displays the first month of the date range that you specified for that field.

For example, if the priority defined for the **Planned Start Date** field is 1, the **Planned End Date** field is 2, and **Last Modified** field is 3. The **Calendar** view displays the first month of the date range for the **Planned Start Date** field.

Note: If you do not specify the date range (value) for the field with priority 1, then the first month of the date range that is specified for the field with priority 2 is displayed.

View Items on a Gantt Chart

In the **Calendar** view for **Plans**, click **Gantt** to display all of the items on a Gantt chart.

View Items in a Month, Quarter, or Year

On the Gantt chart, by default the bars are displayed in the **Quarterly** view for the items that span three months. But, if you selected a month in another view, the bars for items that occur in the selected month are displayed.

The **Quarterly** view displays the items that occur in a selected quarter. Click the **View range** drop-down list and select **Monthly** to view the items that occur in a selected month. Select **Yearly** from the **View range** drop-down list to view the items that occur in a selected time span of several months or a selected year. Use **<** and **>** to navigate between consecutive months, quarters, or years.

On the Gantt chart, the bars display the status for each item. Alongside the Gantt chart, the items are also displayed in a hierarchy. The items in the hierarchy are sorted by the **Last Modified** date. Click **Expand All** to view the nested items in the hierarchy. Click **Collapse All** to view the items at the highest level.

Note: In the **Gantt** view, the **Go to Today** link is not available for navigation.

Specify a Time Period

You can specify a time period to view the items that occur during that period. In the **View range** drop-down list, click below **Custom range**, and select the ‘from’ and ‘to’ dates. The calendar displays the items that occur during that date range. The selected date range is displayed at the top of the window.

Depending on the custom date range that you specified, the calendar displays the following views:

Table 24.1 Custom Date Ranges

Selected Custom Date Range	Display Format
Less than 30 days	Monthly format

Selected Custom Date Range	Display Format
31 days to 90 days	Quarterly format
90 days to less than one year	Quarterly format, with multiple quarters
One year or more	Yearly format

Note: When you specify a custom date range, the < and > buttons and the **Go to Today** link are not available for navigation.

View the Planned Schedule for an Item and Its Nested Levels

You can view the planned schedule for an item and the nested levels in the planning hierarchy. In the **Table** view for **Plans**, click an item to open it. On the **Relationships** tab, click . to see the item and all of its nested level items in the **Calendar** view.

By default, the **Calendar** view displays items in the **Gantt** view, and the quarterly period is selected. The items in the hierarchical list are sorted by the **Last Modified** date. The display periods for the **Month**, **Week**, and **Day** views are based on the **Planned Start Date** of the first item.

Click **Day**, **Week**, or **Month** to view the items for the specified time period. The time period for the views depends on the **Planned Start Date** for the item at the highest level in the hierarchy.

Click **Expand All** to view the nested items in the hierarchy. Click **Collapse All** to view the items at the highest level.

Click an item to open it and view its details. The breadcrumbs enable you to navigate the levels in the planning hierarchy for the item.

Add a New Item from the Calendar View

To add a new item from the **Calendar** view, select a date in the **Month** or **Week** view, click , and then select the planning option that you want to add.

Note: If you do not select a date on the calendar, by default, the current date is the **Planned start date** for the item that you add.

In the new item, add the values for the **Standard** fields, click , and then click **Close**. The new item is displayed on the calendar.

To add a new item in the **Day** view, navigate to a date, click , and then select the planning option that you want to add. The selected date is automatically displayed as the **Planned start date**.

Similarly, in the **Month** view and in the **Week** view, you can add an item for a time period that spans a range of selected dates in that view. Drag your mouse over a range of dates to select them, click , and then select the planning option that you want to add. The first and last dates that are selected are populated in chronological order as the **Planned start date** and **Planned end date,** respectively. Add the values for the remaining **Standard** fields in the new item, click , and then click **Close**. The new item is displayed on the calendar. If you change the **Planned start date** and **Planned end date**, click to ensure that your changes are reflected in the **Calendar** view.

Configure Settings for Planning Items

About Settings for Planning Items

You can configure preferences and settings to customize the look and feel of the calendar for all of the planning items in the hierarchy. On the **Plans** page, click and click **Settings**. The **Settings** window shows the **Display** page.

Note: Changes to these settings affect only planning items in the **Calendar** view.

Configure Time Span to Display Items

On the **Display** page, in the **Time span to display items** drop-down list, the **Show through entire time span** option is selected by default. To customize the time span to show planning items, click the drop-down list and select an option:

- **Show only start date**
- **Show only end date**
- **Show only start and end dates**

Note: The **Time span to display items** drop-down list displays the default selection, based on the settings that are configured in the calendar definition after the tenant is onboarded.

Configure Display of Holidays and Weekends

You can configure the visual display settings to show holidays and weekends in a different color from working days. On the **Display** page, make these selections:

- Select the **Show holidays** check box to show holidays in a different color.

  The holiday labels are displayed, depending on the holidays that are configured for your organization.

- Select the **Highlight weekends** check box to show weekends in a different color.

The settings are applied to the **Day**, **Week**, **Month**, and **Gantt** views.

Note: In the **Gantt** view, holidays are displayed only in the **Monthly** view. To view the holiday label, move your mouse pointer over the blue bar on that date.

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Managing Workflows

Creating Workflows

About Workflows

Workflows enable you to automate processes to save time. A workflow consists of a series of steps that are executed in a specific order to track the progress of a project. Marketing teams can build workflow templates based on best practices. These templates can be created for product launches, collateral designs, advertising, direct marketing, sponsorships, event management, and so on.

Create a Workflow

To create a workflow:

1. Click the **Workflows** tab of the planning item.
2. Navigate to **Workflow List** ⇨ **Start Workflow.**
3. Select a workflow template and click **Continue**. A diagram of all the workflow tasks for each workflow template is displayed. The workflow templates are configured by your administrator and made available to the users in your organization.
4. On the **Details** tab, complete the information about the standard and custom properties. The section for Standard properties provides the following information that uniquely identifies the planning item:
   - In the **Name** field, add a unique name. You can also add a description of the workflow.
   - The **Source** and **Source name** fields provide the details of the source planning item. The source planning item is the item instance where the workflow was initiated.
   - The **Start date**, **Planned end date**, **Projected end date**, **Status**, and **Progress** fields provide information about the workflow schedule and progress.
   - In the **Categories** field, select a category from the drop-down list. If you have already selected a default category in the workflow template, that category is automatically displayed and can be updated. Depending on the selected category, the custom properties are displayed.

     Note: The attribute groups for the custom properties are listed, depending on the category that you select. Selected attribute groups (not included in any category) from the workflow template are also displayed.
   - Custom properties provide additional business information related to the planning item. Custom properties are specifically configured to your organizational context and needs. In the **Custom** properties section, enter the information for the custom fields that are configured for your organization. For more information, see "Custom Properties" on page 142.
   - Click to export the standard and custom properties for the workflow to a PDF file. Use the options in the PDF reader to download and generate a digital or printed copy of the PDF file.
   - Click to add comments. Enter the topic name and comments, and then click **Post** to post the comments.

     Note: Depending on the duration for each contributor, the end date is updated.
5. On the **Workflow Tasks** tab, select the contributors who will execute the tasks by clicking **+**.
6. For each contributor, enter the duration in days. The duration is the number of working days, excluding weekends and holidays, that the contributor has to

complete the workflow task. When you enter the duration, the due date is automatically calculated.

7 Alternatively, you can change the due date and the duration is calculated accordingly.

8 Click **Add** to provide instructions to each contributor individually.

9 Click ⋮ and select **Edit details** to add these details to the workflow task:

- Enter the duration in days.
- Click **Add** to provide instructions to the contributor.
- Click to change the contributor.
- Click to change the task name.
- Click to add attachments. Click **Add** and add the supporting files.
- Click to add comments. Enter the topic name and comments, and then click **Post** to post the comments.

10 Click **Activate** to start the workflow on the supplied start date. To save a draft of the workflow, click .

11 A workflow with a status of In Progress is initiated.

You can switch between a table view of the workflow task and a calendar view by clicking the appropriate icons. You can access a Gantt view to visualize the start and end dates for each workflow task and the contributors. If a contributor is removed from a task, that contributor is not visible in the calendar view.

Cancel a Workflow

When you create and initiate a workflow, its status is In Progress. To cancel the workflow:

1 On the **Workflow List** tab, click the workflow. A workflow details screen is displayed.

2 Click .

3 The status of the workflow changes to Canceled.

Update Tasks

1 On the **Workflow Tasks** tab, a list of your assigned tasks is displayed.

2 Click the workflow to enter your response, and then click **Mark Complete**.

3 The completed task is removed from the list.

Delete Workflows

You can delete workflows that are completed, canceled, or in draft form.

1 On the **Workflow List** tab, select the workflows that you want to delete.

2 Click 🗑.

Responding to Workflow and Approval Tasks

View the Workflow and Approval Task List

To view all the workflow and approval tasks that are active and assigned to you:

1 On the left navigation bar, click **My Workflow Tasks** or click the link that you receive in the email notification about the task.

2 A list of the workflow and approval tasks assigned to you is displayed.

For approval tasks, the workflow name column refers to the item name that has been routed for approval.

Respond to a Workflow Task

To respond to a workflow task that is assigned to you:

1 Click the task name in the task list. You can view details such as start date, due date, status, and whether the task is on time.

2 The **Reference Information** section is displayed with a link to the planning item where the workflow was initiated. The link is available only if the administrator configures the option to show a link in the task so that the contributor can view the details. You can click the link to view the details of the planning item.

3 In the **Preceding Workflow Task** section, the details of the task that is configured as a preceding task by the administrator are displayed. All the configured information from the previous task can be viewed.

4 In the **Status Update** section, you can complete these actions:

- In the **Response** comments box, enter your comments. A response can be mandatory or optional, depending on how the workflow task is configured.

- In the **Response resources** field, select the resources to include in your response. You can add a file or a URL to the workflow task to support your response.

  Adding response resources can be mandatory or optional, depending on how the workflow task is configured. You can also specify settings for adding files or URLs.

  There is no restriction on the resource types. You can upload multiple resources. Ensure that the upload is complete and that there are no errors. Resources with errors are removed from the list. Files can be downloaded by the initiator and by other contributors.

5 You can delete an uploaded resource by clicking .

To attach reference files, click , and then click **Add** and upload the files.

If you select a template with multiple contributors and approvals when creating a workflow, the contributors can upload resources for approval. All the contributors in the Workflow can view and approve or reject the resources individually and add comments. If an added resource is rejected, the contributor of the previous task needs to change and upload the resources again for approval.

You can save the task without marking it complete by clicking . Saving the task enables you to keep adding details to the task as you progress. You can mark the task complete when you have entered all the necessary details. For more information, see "Complete a Workflow Task" on page 290.

Respond to an Approval Task

To respond to a workflow task that is assigned to you:

1 Click the task name in the task list. You can view details such as start date, due date, status, and whether the task is on time.

2 The **Reference Information** section is displayed with a link to the planning item where the workflow was initiated. The link is available only if the administrator configures the option to show a link in the task so that the contributor can view the details. You can click the link to view the details of the planning item.

3 In the **Preceding Workflow Task** section, the details of the task that is configured as a preceding task by the administrator are displayed. All the configured information from the previous task can be viewed.

4 In the **Status Update** section, you can complete these actions:

   - All of the resources for approval are listed on the **Items for Approval** tab. You can approve or reject the item for approval and add your comments. You can also annotate the video and image files. For more information, see "Annotate Files" on page 288.
   - On the **Details** tab, responses from previous tasks are displayed. You can download the annotated PDF files with all annotations and comments embedded in the file. You have the option to download files with or without annotations.
   - In the **Response** comments box, enter your comments. A response can be mandatory or optional, depending on how the workflow task is configured.

Note: By default, the feature that enables the upload of response resources is not available for an approval task. This feature can be configured if required.

To attach reference files, click , and then click **Add** and upload the files.

If you select a template with multiple contributors and file approvals when creating a workflow, the contributors can upload resources for approval. All the contributors in the Workflow can view and approve or reject the uploaded resources individually and add comments. If a resource is rejected, the contributor of the previous task needs to change and upload the resources again for approval.

You can save the task without marking it complete by clicking . Saving the task enables you to keep adding details to the task as you progress. You can mark the task complete when you have entered all the necessary details. For more information, see "Respond to an Approval Task " on page 287 and "Complete an Approval Task" on page 290.

Cancel a Workflow Task

You can cancel any workflow task that does not have a completed status in an active workflow.

Note: You cannot cancel a task in an approval workflow or a workflow that has a single task. Instead, you must cancel the workflow.

From the left navigation bar, click **My Workflows**. On the **Workflow Tasks** tab, click , and then click **Cancel task**.

TIP You can cancel a workflow task from the details view. Click and click **Edit details**. On the details page of the workflow task, click to cancel the workflow task.

If the attributes of the workflow task are used in subsequent conditions, or if the task has a file upload option that might be affected by the cancel action, you cannot cancel the task.

If the workflow task does not have any subsequent conditions or dependencies that might be affected, the dates are rescheduled and the workflow continues. The task displays a Canceled status and the date for the subsequent task is updated to the current date.

Annotate Files

Annotate an Image File

These image files can be annotated:

- GIF
- JPEG

- BMP
- PNG
- SVG

To annotate an image file:

- Click an image file to open it.
- Select the annotation tools, mark the area, and add comments in the comments pane.
- You can view all comments in the comments pane by clicking **View All Comments**. To view a specific comment, use the select tool and select the annotation.
- You can edit a comment by clicking , delete a comment by clicking , and respond to the comment.
- To view the latest responses, click to synchronize the responses.
- Use the search box to search for a specific comment.
- The annotations are saved automatically.

Annotate a Video File

These video files can be annotated:

- Mp4

  Note: Mp4 videos must conform to video H264 codec and audio AAC codec standards.

- WebM
- OGV

To annotate a video file:

- Click a video file to open it.
- Play the video. Pause when you want to annotate a frame.
- Select the annotation tools and mark the area. Add comments in the comments pane.
- You can view all comments in the comments pane by clicking **View All Comments**. To view a specific comment, use the select tool and select the annotation.
- You can edit a comment by clicking , delete a comment by clicking , and respond to the comment.
- To view the latest responses of other contributors, click to synchronize the responses.
- Use the search box to search for a specific comment.
- The annotated frames are listed in the **Annotation Navigator** section.
- The annotations are saved automatically.

Annotate a PDF File

To annotate a PDF file:

- Click the PDF to open it. All the comments on the first page, if any, are displayed.
- Select the annotation tools such as rectangle, ellipse, freehand drawing, and polygon, and then mark the area. Add comments in the comments pane. You can use text tools such as highlight, strikethrough, and underline.
- You can view all comments in the comments pane by clicking **View All Comments**. To view a specific comment, use the select tool and select the annotation.
- Click the toggle sidebar icon to expand the sidebar. You can switch between viewing the thumbnail of each page and viewing the document outline. The document outline can be viewed only if it has been configured for the PDF file.
- You can edit a comment by clicking , delete a comment by clicking , and respond to the comment.
- To delete an annotation, select the annotation and click .
- To view the latest responses, click to synchronize the responses.
- Use the search box to search for a specific comment.
- The annotations are saved automatically.

You can search for specific items in the file by clicking and use the zoom tools to change the magnification.

Complete a Workflow Task

To complete a workflow task that is assigned to you:

1. Click the workflow task name in the workflow task list. You can view all the task details.
2. After you respond to the task, click **Mark Complete**.

Complete an Approval Task

To complete an approval task that is assigned to you:

1. Click the approval task name in the task list. You can view all the task details.
2. All of the items that are ready for review and approval are listed below **Items for Approval**.

   Note: By default, the response resources feature is not available for an approval task. This feature can be configured if required.
3. Select **Approve** or **Reject** and add your comments.

4 Click **Submit**.

Managing Your Workflows and Approvals

View the Workflow and Approval List

To view all the workflows and approvals that you initiate:

1 From the left navigation bar, click .

2 A list of all the workflows and approvals that you initiated is displayed. By default, this list displays workflows that are in progress or in draft form and all the approvals that you have initiated. To view all the workflows, remove any filters you placed on your workflows.

Note: The projected end date is the date that the system has calculated for completion of the task.

The actual end date is updated when the workflow tasks are completed.

Edit Workflow Details

Click a workflow name to view the workflow details.

The initiator of a workflow can edit a workflow, which is in progress or in draft form.

- On the **Summary** tab, these workflow details are displayed:
  - start date.
  - planned and projected end dates.
  - status.
  - diagram. Click a task to view its details in the section below the workflow. You can click the task name to add instructions, add or delete contributors, and change the duration of the contributors.
- On the **Details** tab, you can edit and modify the name and description of the workflow. You can also view the details of the source planning item. The source planning item is the item instance where the workflow was initiated.

  Click to add comments. Enter the topic name and comments, and then click **Post** to post the comments.

  Note: Depending on the duration for each contributor, the end date is updated.
- On the **Workflow Tasks** tab, you can perform these actions:

- Add, edit, or delete the contributors for the workflow tasks that are not initiated.

  For a workflow that is in progress, you can only delete the contributors. If you delete a contributor, the workflow task details and the cataloged files that are uploaded by the contributor become unavailable.

- Edit the duration or enter the due date for each contributor and provide instructions. When specifying the duration or due date, remember these details:
  - The duration of the task does not exceed 999 days.
  - If the duration or due date is not specified, by default, the due date is set to the same date as the start date and the duration is 0. This setting indicates that the task should start and end on the same day.
  - For the due date selection, the dates that occur before the current date and weekend are not available for selection.
  - If the duration is specified and the calculated due date falls on a weekend, the due date is automatically changed to Monday.
- Click **View** to view the responses of the contributors for the completed tasks.
- View the progress bar for each task, which indicates the percentage of completed work. For multi-contributor tasks, the completion percentage is calculated by dividing the duration of the completed work by the total duration. If the workflow task is delayed, the progress bar is red and a warning sign is visible in the **Status** column. The initiator can view the responses of the contributors for each task in the workflow.

- On the **File Catalog** tab, you can view all the files that are uploaded by the contributors of the tasks.

  To catalog these files into Assets, select the files to be cataloged and click . Then, select the folder to catalog the asset and click **OK**.

  In the **Catalog Assets** window, click **Catalog**. The status of the catalog job is displayed. Click **Close**.

- Click to view a diagram of the workflow. The task that is in progress is highlighted.

You can activate a workflow that is in draft form and cancel a workflow that is in progress.

Delete Workflows and Approvals

You can delete workflows and approvals that are completed, canceled, or in draft form.

1. Select the workflow or approval that you want to delete.
2. Click .
3. Confirm the deletion.

Note: If a workflow has an approval type of task, the annotations associated with the workflow are also deleted.

Viewing Workflows on a Calendar

View Workflow Items in the Calendar View

You can view the schedule for workflow items on the calendar based on the information that you entered for each workflow and workflow task.

On the navigation bar, click **My Workflows** to view the workflows and approvals that you initiated. Click **My Workflow Tasks** to view all of the workflow and approval tasks that are active and assigned to you. By default, the items are displayed in the **Table** view. Click to see all of the items in the **Calendar** view.

The items are displayed in different color variants, depending on the attribute that is selected for color configuration. For workflow items, the status attribute is configured by default. Click to view the color legend for each of the calendar items.

To view details about a workflow or a workflow task in the **Month**, **Week**, or **Day** view, position your mouse pointer on the item. The tooltip displays the following information about the item, which includes the name of the workflow item, and these fields and their values:

Note: The fields listed in the table display variable values in the tool tip for each item, depending on the information that you entered when you created the items.

Table 25.1 *Tool Tips*

My Workflows	My Workflow Tasks
Start date	**Start date**
Planned start date	**Due date**
Projected end date	**Status**
Status	**Delayed by**
Progress	**Workflow name**
Delayed by	**Submitted by**
Workflow tasks	**Not applicable**
Reference	**Not applicable**
Source	**Not applicable**

View the Workflow Schedule for a Day, Week, or Month

You can view the schedule for one or more workflow items or workflow tasks for a specified day, week, or month. By default, the **Calendar** view displays items in the **Month** view, and the current date is selected. Click **Day**, **Week**, or **Month** to see the items that occur on the selected date, in the selected week, and in the selected month.

To change the selected day, click **Week** or **Month** and select a date. Use **<** and **>** to navigate between consecutive days, weeks, and months. To return to the current date, click **Go to Today**.

View the Workflow Schedule for All Items

In the **Calendar** view for My Workflows and My Workflow Tasks, you can view the items and their statuses. Click an item to open it.

In the **Week** and **Month** views, on a selected date, you can see only a few items due to limitations on the size and resolution of the screen. To view all of the items on a selected date, click **+ (n) more**. All of the items for the date are displayed in the **Day** view.

Search and Filter Workflow Items

Find Specific Items

On the **My Workflows** page and **My Workflow Tasks** page, by default the **Table** view and the **Calendar** view display all of the items for a selected time period. Enter the relevant keywords in the search box to find a workflow item by name or status and a workflow task item by name or type.

To filter items and refine your search, click . You can filter items by **Type**, **Status**, **Source**, **Start Date**, **Planned End Date**, **Projected End Date**, **Actual End Date**, and **Delayed by** number of days.

Find Items in a Specific Time Period

When you switch from the **Table** view to the **Calendar** view, by default the items that occur in the current month are displayed in the **Month** view. You can use the **Start Date**, **Planned End Date**, **Projected End Date**, and **Actual End Date** fields to filter items that occur during the specified time period. You can also use the **Delayed by** field to filter items that are delayed by the minimum number of days that you specify.

Click and in the **Refine Search** pane, enter date ranges in the **Start Date**, **Planned End Date**, **Projected End Date**, or **Actual End Date** fields. Depending on the priority that is defined for these date fields in the calendar definition, the

Calendar view displays the first month of the date range that you specified for that field.

For example, if the priority defined for the **Start Date** field is 1, then the **Planned End Date** field is 2, the **Projected End Date** field is 3, and the **Actual End Date** field is 4. The **Calendar** view displays the first month of the date range for the **Start Date** field.

Note: If you do not specify the date range (value) for the field with priority 1, then the first month of the date range that is specified for the field with priority 2 is displayed.

View Items on a Gantt Chart

In the **Calendar** view, click **Gantt** to display all of the items on a Gantt chart.

View Items in a Month, Quarter, or Year

On the Gantt chart, by default the bars are displayed in the **Quarterly** view for the items that span three months. But, if you selected a month in another view, the bars for items that occur in the selected month are displayed.

The **Quarterly** view displays the items that occur in a selected quarter. Click the **View range** drop-down list and select **Monthly** to view the items that occur in a selected month. Select **Yearly** from the **View range** drop-down list to view the items that occur in a selected time span of several months or a selected year. Use **<** and **>** to navigate between consecutive months, quarters, or years.

On the Gantt chart, the bars display the status for each item. Alongside the Gantt chart, the items are also displayed in a flat list. The listed items are sorted by the **Last Modified** date.

Note: In the **Gantt** view, the **Go to Today** link is not available for navigation.

Specify a Time Period

You can specify a time period to view the items that occur during that period. In the **View range** drop-down list, click below **Custom range** and select the ‘from’ and ‘to’ dates. The calendar displays the items that occur during that date range. The selected date range is displayed at the top of the window.

Depending on the custom date range that you specified, the calendar displays these views:

Table 25.2 *Custom Date Ranges*

Selected Custom Date Range	Display Format
Less than 30 days	Monthly format
31 days to 90 days	Quarterly format
90 days to less than one year	Quarterly format, with multiple quarters
One year or more	Yearly format

Note: When you specify a custom date range, the **<** and **>** buttons and the **Go to Today** link are not available for navigation.

Configure Settings for Workflow Items

About Settings for Workflow Items

You can configure preferences and settings to customize the look and feel of the calendar for workflow items. On the **My Workflows** page and **My Workflow Tasks** page, click ⋮ and click **Settings**. The **Settings** window shows the **Display** page.

Note: Changes to these settings affect only workflow items in the **Calendar** view.

Configure Time Span to Display Items

On the **Display** page, in the **Time span to display items** drop-down list, the **Show through entire time span** option is selected by default. To customize the time span to display for workflow items, click the drop-down list and select an option:

- **Show only start date**
- **Show only end date**
- **Show only start and end dates**

Note: The **Time span to display items** drop-down list displays the default selection, based on the settings that are configured in the calendar definition after the tenant is onboarded.

Configure Display of Holidays and Weekends

You can configure the visual display settings to show holidays and weekends in a different color from working days. On the **My Workflows** page and **My Workflow Tasks** page, click ⋮ and click **Settings**. The **Settings** window shows the **Display** page.

Make these selections:

- Select the **Show holidays** check box to show holidays in a different color.

  The holiday labels are displayed, depending on the holidays that are configured for your organization.

- Select the **Highlight weekends** check box to show weekends in a different color.

The settings are applied to the **Day**, **Week**, **Month**, and **Gantt** views.

Note: In the **Gantt** view, holidays are displayed only in the **Monthly** view. To view the holiday label, move your mouse pointer over the blue bar on that date.

PART 6

Tracking Behavioral Data with Events

26

About Events and Collecting Data

About Events and Collecting Data

Introduction

Events use customer data to track behavior and trigger actions. Events can be used in spots, segments, tasks, data views, and activities. Events are also used in metrics and reporting. For example, you can use an event to trigger the start of an activity. You can also use events to track the behavior of people who click a spot on a web page or a mobile app. For more information about the different types of events, see “Types of Events”.

Why Track Customer Behavior?

SAS Customer Intelligence 360 enables you to enhance your ability to understand, target, and interact with your visitors in a meaningful way. The data that you collect for visitors can be used to monitor how visitors are coming to your site, track individual behavior patterns, generate demographic information, and provide feedback on targeted marketing. The data is routed in real time to the processing environment of SAS Customer Intelligence 360 to enhance your visitor's experience with the site, and the data can also be exported to other solutions for segment analysis.

You can take advantage of all of these benefits of data collection:

Dynamic Data Collection
: Embed a single line of HTML within each web page to automatically start collecting data for that page. This information includes what the customer views and does, the order and timing of elements loading on the page, the positioning of a pointer over a selection, each keystroke on a form, and so on. The result is a collection of usable information immediately within SAS Customer Intelligence 360 or for analysis days after implementation.

Open Data Model
: All gathered data is housed in an open, customer-centric data model that promotes further data exploration and analysis. The data is logically structured within a predefined business context for easy integration with existing customer data. This model provides the opportunity for immediate data analysis and reporting and empowers nontechnical staff to produce ad hoc reports quickly.

Anonymous Behavior Capture
: Everyone who visits your website, whether that visitor is identifiable, is treated as a customer whose behavior is recorded over time. If you can identify a visitor later, anonymous behavior that was previously collected is automatically assigned to the visitor's unique profile. The result is a richer, more comprehensive view of your visitors.

Re-Marketing Capabilities
: When you merge visitors' digital data and information about how they use your services, you can use this data for enhanced outbound campaigning. The usage data that you collect presents an opportunity to re-market to visitors who have expressed an interest in your product or service but have not yet made a purchase.

Use Collected Data with SAS Customer Intelligence 360

Tracking user interaction is one of the core features that enable your site to respond in real time to visitors based on their profile, origin, browsing behavior, and so on. When a visitor interacts with your site (for example, through a click event), that event is processed by the run-time environment and can be used to control many of your site's features. The interactions that you monitor are the driving force behind many of the activities and events that you define in SAS Customer Intelligence 360.

The data that you collect can be used in many ways, including these:

- optimizing marketing offers
- developing customer engagement and targeting techniques such as inbound offers or personalized advertisements
- highlighting or initiating opportunities for social engagement with your visitors

How Data Is Collected

About Site Configuration

Data collection is enabled by the SAS tag, which is a JavaScript tag that references a file that is downloaded to a visitor's browser. To initiate data collection, you insert a JavaScript tag in the HTML markup for pages that you want to track. The JavaScript tag itself does not change, but you must insert the tag on every page you want data collected for.

When a visitor connects to your site, the JavaScript is downloaded to the visitor's browser. When the SAS tag sends data back to your site, SAS Customer Intelligence 360 generates a unique session ID and user ID for the visitor based on which configuration rules match the visitor. Data is then collected for any interactions the visitor has with your site. The data is supplemented with information such as the visitor's location and device information. If you need to span multiple domains to capture customer behavior, you can insert the SAS tag on each site to track users in a continuous session. For more information, "Capturing Sessions That Cross Domains" on page 17.

If the visitor is a user that you already have some data for, the data that you collect is associated with the visitor's profile. If the user is anonymous, you can still collect the data, but it is stored with a generic user ID. If you determine the identity of that user later (for example, when the user registers for the site), this anonymous data is reassigned to the visitor's new profile.

The availability of SAS Customer Intelligence 360 affects the retrieval of visitor data, so if there is a problem connecting, then visitor data might not be returned.

Note: The number of events that is collected for each session is limited to a maximum of 2,000.

To enable data collection or refine how it works with your site, review the configuration steps in these topics:

- "Preparing Your Site" on page 15
- "Domains" on page 20
- "User Identities" on page 87
- data collection settings:
  - data collection controls on page 34
  - page and session settings on page 34

- personally identifiable information on page 42
- form fields on page 40

- “Defining Basic Collection Rules” on page 329
- “Defining Advanced Collection Rules” on page 332

Managing Cookies

SAS Customer Intelligence 360 uses a combination of first-party and third-party cookies:

First-party cookies
: When the SAS tag is inserted in the HTML for your site's page, the tag's script creates a first-party cookie for session and visitor tracking in that domain.

  If a mobile cookie is present for SAS Customer Intelligence 360 in a user's mobile embedded browser, but the web cookie does not exist yet, then the mobile cookie is used by the web session to share session information from the mobile application (app).

Third-party cookies
: When a user's browser requests the SAS tag, a third-party cookie is exchanged and used for cross-domain tracking and to establish another reference of session information in the current domain.

  Third-party cookies are needed only for cross-domain tracking (for example, tracking from www.abc.com to www.xyz.com). They are not necessary for single domains or subdomains. For example, a single cookie for sas.com would cover both www.sas.com and support.sas.com.

  If a user rejects third-party cookies and the SAS tag server is on a different domain, then SAS Customer Intelligence 360 is unable to track behavior across domains. However, normal tracking still works with the first-party cookie.

Securing Personally Identifiable Information (PII) in the Cloud

To keep PII safe in the cloud, SAS Customer Intelligence 360 obfuscates the data with a SHA-384 hashing algorithm. SHA-384 hashing is an irreversible, one-way algorithm. This method is designed in a way that makes it very difficult to reverse. By contrast, SAS Customer Intelligence 360 does not use encryption, because that would enable other parties to decrypt the data if they have the key.

For an example of the hashing process, assume that there is a tenant with a tenant ID of 822a14c29a000126a695b11e. The tenant ID appears in the SAS tag when it is inserted in the site’s HTML:

```
<script src="/lib/ot_async.js" type="text/javascript"
   id="ob-script-async" a="822a14c29a000126a695b11e"></script>
```

When SAS Customer Intelligence 360 collects input data (such as an email address), these actions occur on the browser side:

1 The input data is converted to lowercase before any hashing is applied.

2 The input data is processed by the hash algorithm that processes the input data based on a hash salt (in this case, the tenant’s ID):

   ```
   SHA-384(sample.email@sas.com822a14c29a000126a695b11e)
   ```

3 The hashed data that is produced (a 96-character hexadecimal string) is sent to the server.

If someone were to intercept the value that is transferred to the server, and they know the hashing algorithm that is used, then they could generate a lookup table. This breach could occur because the salt is shown on the page. However, intercepting this information would require hacking into an SSL connection (which has not been achieved yet).

When the cloud server receives the hashed data, the data is then applied to another SHA-384 function. For this hashing process, the tenant name is used for the value of the salt parameter. The data that is stored in the cloud is a 96-character hexadecimal string (the double hashed string from the SHA-384 algorithm) and no PII.

To match online and offline data, the tenant can create a mapping table by reversing the double hash with the tenant ID and tenant name. If someone were to gain access to the cloud data, they could not create a lookup table without the tenant name (which is known only to the tenant and is not publicly available).

When Data Cannot Be Collected

SAS Customer Intelligence 360 can collect data from a variety of browser technologies and types, but there are a few limitations that depend on your visitors' configurations. SAS Customer Intelligence 360 cannot collect data in cases such as these:

- A visitor has turned on Do Not Track (DNT) settings in their browser.
- You configure a _SI_DNT cookie in your visitors' browsers to disable tracking.
- A site domain is not active. For more information, see “Domains” on page 20.
- The site design uses a modified implementation of event propagation. If the normal event propagation phase is modified in any way, the registered listener might not be called. In situations where you use short-circuit logic to handle an event by returning "false" to a conditional test, data collection might not be aware that the event took place.

Types of Events

You can use events to complete these actions:

- Create a segment. For more information, see “About Segments” on page 471.
- Add targeting to a task.
- Trigger an activity.
- Create a data view. Data views are used when adding target audiences to a task or setting metrics in tasks and activities. For more information, see “About Data Views” on page 459.

Some events apply to specific channels, such as email or web or mobile.

Note: The number of events that is collected for each session is limited to a maximum of 2,000.

There are several types of events that are used in different ways.

Task events
: Task events are triggered when a user completes the conditions for a task. Examples of task events are pressing a button or opening a push notification. You can select a task event when you create a primary or secondary metric for a task.

Standard events
: Standard events are events that are defined by SAS Customer Intelligence 360. You can select a standard event when you add targeting to a task.

Table 26.1 Standard Events

Name	Channel
Click Through	Web, Mobile
Mobile App Defocus	Mobile
Mobile App Focus	Mobile
Impression	All
New Session	Web, Mobile
Page View	Web, Mobile

Global events
: Global events are a combination of user-defined events. For example, if you create three different Product Views, the Product Views are rolled up into one event. You can select a global event when you add targeting to a task and when you create a data view.

User-defined events
: User-defined events are events that you create. For more information, see “User-Defined Events”.

User-Defined Events

Create events by navigating to **Events** and clicking . Some events apply to specific channels, such as email or web or mobile.

Note: The number of events that is collected for each session is limited to a maximum of 2,000.

Email Events

Email events are user-defined events that capture specific information about how your recipients interact with email content. For more information about email events and how to create them, see “ About Email Events” on page 375.

Table 26.2 Email Events

Name	Description
Send	Defines an event when an email is sent to a recipient
Open	Defines an event when an email recipient opens the email
Click	Defines an event when a call-to-action link is clicked by an email recipient
View	Defines an event when an email recipient views the web version of the email content
Reply	Defines an event when an email recipient replies to an email
Complaint	Defines an event when a complaint is registered by an email recipient
Hard Bounce	Defines an event when a recipient does not receive the targeted email and the email bounces back
Opt-out	Defines an event when a recipient clicks the unsubscribe or opt-out link in the email to discontinue receiving further emails

External Events

External events are user-defined events that interact with one or more specified external applications. These events are injected into SAS Customer Intelligence 360 to trigger a task to use channels such as websites, email, or mobile applications to target customers. For more information, see “Creating External Events” on page 413.

Mobile Events

Mobile events are user-defined events that capture information about how users interact with a mobile application. For more information, see these topics:

- "Creating Mobile Events" on page 377
- "Creating Mobile Product View Events" on page 380

Table 26.3 Mobile Events

Name	Description
Mobile	Define an event when a user interacts with a mobile application
Product View	Define an event when a visitor views a product on a mobile device

Web Events

Web events are user-defined events that capture information about how visitors interact with web content. For more information, see Chapter 27, "Creating Web Events," on page 309.

Table 26.4 Web Events

Name	Description
Cart	A cart process defines the page on your site that represents a shopping cart.
Add to Cart	Define an event when a user adds a product to a cart.
Cart View	Define an event when a user views a cart.
Check-out View	Check-outs are a way for you to define an online store's check-out page and the elements within it.
Click	Define an event when a page element is clicked.
Form Submit	Define an event when a user submits a form.
Page View	Define an event when a user views a page.

Name	Description
Product View	Define an event when a visitor views a product on a web page.
Purchase View	Purchase configurations enable you to collect data on a visitor's shopping experience.

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Creating Web Events

About Web Events

Use web events to identify how visitors interact with your web content. Web events can trigger a task, set a metric, or define a segment. You can combine different types of events in a data view that can be used for task targeting and metrics. For more information, see "About Data Views" on page 459.

Manage Web Events

When an event is open, content delivery and event processing are suspended for the site on any tab in the same browser instance. To see content delivered or to process events on the site while you are creating or editing an event, open the site in a different browser.

Note: The number of events that is collected for each session is limited to a maximum of 2,000.

Event attributes can also be used in personalization variables. Personalization variables are used in tasks to deliver creatives that contain information that is dependent on user behavior. For example, a variable can be replaced with the name of a product that a user has added to the cart or a user's cart total. Event attributes collect data that personalization variables use. A personalization variable eventually needs to be replaced by information retrieved from an event attribute. As a result, at least one event containing an attribute must exist in the system before a creative with a personalization variable can be successfully delivered by a task.

For more information, see "Personalizing HTML Creatives" on page 630.

View Usage Information

From the **Orchestration** ⇨ **Usage** tab, you can view which items use the event.

The ability to view dependencies between items enables you to see the items that a task depends on to work successfully. Usage information helps you identify how changes that you make to one item might affect another item.

Items That Use the Event

The first section shows the items that use the event. For example, if the event is used in a task, the task is included in the list.

The Priority column displays the priority of like tasks that use the event. Priority applies only to mobile spot, web spot, and mobile in-app message tasks because each of those task types might have two or more tasks that compete for the same resources. Other task types do not use prioritization.

For non-A/B test tasks, priority is on a scale of 1 through 5 (where 1 is the highest). The default is 3. An A/B test task has a priority of Test, which is higher than a non-A/B test task. An A/B test task always delivers its content.

You can change the priority of a non-A/B test task on the task's **Orchestration** ⇨ **Priority** tab.

To open an item, click the item. To view item details and to open the item, click ⓘ in the item's row.

Items That the Event Uses

The second section shows items that the event uses. Because an event does not use another item, the list is empty.

Creating Add to Cart Events

You can define an event when the customer adds products to their cart. You set up rules that identify if the user clicks on a page element or submits a form.

To create an add to cart event:

1 Click **Events**.

2 Click .

3 Select **Add to Cart**.

4 Select the event type to use.

- Select **Click** to define an event when a page element is clicked. For more information, see “Creating Click Events” on page 317.
- Select **Form Submit** to define an event when the user submits a form. For more information, see “Creating Form Submit Events” on page 319.

5 Refine the pages that are associated with your event by navigating to **Event Details** ⇨ **Event Configuration**.

- Select **Only page where selector was chosen** to include only the page that you selected on the **Target Location** tab.
- Select **Any page** to include all pages that contain the click target that you defined.
- Select **Pages matching attribute pattern** to define rules that determine which pages to include. You can create a pattern that matches a URL, a domain, or an element.

6 Define rules for assigning product attributes by navigating to **Event Details** ⇨ **Product Attributes**. You can collect product information such as product ID, SKU, and unit price.

Adding attributes enables you to collect additional information about the action that triggers the event and the page that contains the event. The attribute data that is collected can be used elsewhere. For example, attributes that you add to this event can be selected as criteria when you define a segment. The available attributes vary by event type.

Note: After an event is published, you can add new attributes but you cannot modify existing attributes.

a Click ✚ and select the attribute type.

b Define the attribute’s properties and return value.

Note: Do not exceed 150 characters for an attribute’s name or value.

For the **Return value from** field, select a value based on the type of element:

- For attributes, select the name of the attribute.
- For field values, select **value**.
- For the content of a node, select **innerHTML** or **innerText**, depending on the node type.
- If you use a JavaScript object, you must specify *object.property* in the **Variable name** field. You cannot specify only the object.

c For the **Return** field, specify the part of the return value that you want returned.

d Select an option for **Attribute data type**. For some attribute types, this option cannot be modified.

e (Optional) Select **Personally identifiable information** if the associated data is considered personal information. For some attribute types, this option is not available.

When this option is enabled, the system stores the data in a temporary table. The data is then discarded after it is used by associated tasks.

Note: For email data types, the **Personally identifiable information** option is enabled and cannot be deselected.

7 Define rules to identify custom attributes for the add to cart event. Navigate to **Event Details** ⇨ **Custom Attributes**.

Note: If you use a JavaScript object, you must specify *object.property* in the **Variable name** field. You cannot specify only the object.

8 On the **Orchestration** tab, complete one of these actions:

- Select **Mark Ready** to change the status from Designing to Ready. A Ready status indicates that this item is ready to be published. When you are ready to promote an item from a Ready status to an Active status, click **Publish**.

  Note: When you publish an item, you are prompted to publish any dependent items that are marked Ready.

  Items with a Ready status can be changed back to a Designing status by clicking **Return to Designing**. Changing this status to Designing prevents the item from being published.

  Note: If your item has a Ready status and a start date, the item is not automatically published when the start date is reached. For example, if you are creating a task, it must be published in order for the start date to activate the task.

- Select **Mark Ready and Publish** to change the status from Designing to Active. Items with an Active status cannot be changed back to Designing.

If the content of a published item is changed and saved, that item becomes out of sync with the published version. To synchronize the content, select **Republish**. Otherwise, the item stays out of sync with the published version and the updates are not delivered.

For more information, see “Republishing Out of Sync Items” on page 138.

9 (Optional) Click ⋮ and select **Properties** to add a name and a description.

You can also associate an add to cart event with a product view event, in cases where you do not want to have a separate add to cart event. To create an add to cart event from within a product view event, see “Creating Product View Events” on page 323.

Creating Cart View Events

A cart view event defines an action in which a customer views products in their shopping cart. Cart events can work together with check-out and purchase events. You set up rules that identify this page and actions such as products in the cart, the cart ID, or SKUs for products in the cart.

To track cart-related events that are too complex for this event type, you can use a cart event in the JavaScript events API. For more information, see “Cart Events” on page 357.

To create a cart event:

1 Click **Events**.

2 Click .

3 Select **Cart View** for the event type.

4 Select **Page View**.

5 Navigate to the web page that a visitor loads and click **Create Event**.

Note: You can change which page is associated with this event from the **Page Location** tab.

6 Refine the pages that are associated with your event by navigating to **Event Details** ⇨ **Event Configuration**.

- Select **Only page where selector was chosen** to include only the page that you selected for the event's location.
- Select **Any page** to include all pages that contain the click target that you defined.
- Select **Pages matching attribute pattern** to define rules that determine which pages to include. You can create a pattern that matches a URL, a domain, or an element.

7 Define rules to identify attributes for products in the cart. Navigate to **Event Details** ⇨ **Cart Product Attributes**.

Adding attributes enables you to collect additional information about the action that triggers the event and the page that contains the event. The attribute data that is collected can be used elsewhere. For example, attributes that you add to this event can be selected as criteria when you define a segment. The available attributes vary by event type.

Note: After an event is published, you can add new attributes but you cannot modify existing attributes.

a Click **+** and select the attribute type.

b Define the attribute's properties and return value.

Note: Do not exceed 150 characters for an attribute's name or value.

For the **Return value from** field, select a value based on the type of element:

- For attributes, select the name of the attribute.
- For field values, select **value.**
- For the content of a node, select **innerHTML** or **innerText**, depending on the node type.
- If you use a JavaScript object, you must specify *object.property* in the **Variable name** field. You cannot specify only the object.

c For the **Return** field, specify the part of the return value that you want returned.

d Select an option for **Attribute data type**. For some attribute types, this option cannot be modified.

e (Optional) Select **Personally identifiable information** if the associated data is considered personal information. For some attribute types, this option is not available.

When this option is enabled, the system stores the data in a temporary table. The data is then discarded after it is used by associated tasks.

Note: For email data types, the **Personally identifiable information** option is enabled and cannot be deselected.

8 Define rules to identify attributes for the entire cart. Navigate to **Event Details** ⇨ **Cart Attributes**.

For each of the categories on this tab, complete these steps:

a Select **Define value**.

b Click and select the element that corresponds to the category. For example, the element might be a cell in a product cart's table.

9 Define rules to identify custom attributes for the cart. Navigate to **Event Details** ⇨ **Custom Attributes**.

Note: If you use a JavaScript object, you must specify *object.property* in the **Variable name** field. You cannot specify only the object.

10 On the **Orchestration** tab, complete one of these actions:

- Select **Mark Ready** to change the status from Designing to Ready. A Ready status indicates that this item is ready to be published. When you are ready to promote an item from a Ready status to an Active status, click **Publish**.

  Note: When you publish an item, you are prompted to publish any dependent items that are marked Ready.

  Items with a Ready status can be changed back to a Designing status by clicking **Return to Designing**. Changing this status to Designing prevents the item from being published.

  Note: If your item has a Ready status and a start date, the item is not automatically published when the start date is reached. For example, if you are creating a task, it must be published in order for the start date to activate the task.

- Select **Mark Ready and Publish** to change the status from Designing to Active. Items with an Active status cannot be changed back to Designing.

If the content of a published item is changed and saved, that item becomes out of sync with the published version. To synchronize the content, select **Republish**. Otherwise, the item stays out of sync with the published version and the updates are not delivered.

For more information, see "Republishing Out of Sync Items" on page 138.

11 (Optional) Click ⋮ and select **Properties** to add a name and a description.

12 Publish the event in the data collection configuration. This step is necessary because the event type was previously an advanced collection rule, and the event is still used to populate those data tables.

a From the navigation bar, click **Data Processing**.

b In the Published Status section, click **Publish**.

Creating Checkout View Events

Checkouts are a way for you to define an online store's checkout page and the elements within it. You can define similar rules to those you define for a cart process, but you can also define rules that are specific to a checkout process.

To create a checkout view event:

1 Click **Events**.

2 Click .

3 Select **Checkout View**.

4 Select **Page View**.

5 Navigate to the web page that a visitor loads.

Note: You can change which page is associated with this event from the **Page Location** tab.

6 (Optional) Click **Select Row for Product Checkout** and select the element that identifies each product's row in the checkout process. When you select an element, the **Selector** field displays the corresponding CSS selector. You can refine this selector if you need to match an element based on different characteristics.

You can change this element by navigating to **Event Details** ⇨ **Checkout Product Attributes** for the event. Then, click to select a new element in the **Checkout row selector** field.

7 (Optional) Click **Select Product Attributes for Checkout** to define the attribute for the product in the checkout process.

You can change this attribute selection by navigating to **Event Details** ⇨ **Checkout Product Attributes** for the event.

8 Select which default attributes to set values for in the **Attribute** list.

- **Product Name** is a required attribute.

  Note: Product names are limited to 40 characters.

- Click **Select Parent** to refine the selector.
- Click **Returned Value** to preview and edit the value that the attribute returns.

9 Click **Create Event**.

10 Refine the pages that are associated with your event by navigating to **Event Details** ⇨ **Event Configuration**.

- Select **Only page where selector was chosen** to include only the page that you selected for the event's location.
- Select **Any page** to include all pages that contain the click target that you defined.

- Select **Pages matching attribute pattern** to define rules that determine which pages to include. You can create a pattern that matches a URL, a domain, or an element.

11 Define rules to identify attributes for each product. Navigate to **Event Details** ⇨ **Checkout Product Attributes**.

Adding attributes enables you to collect additional information about the action that triggers the event and the page that contains the event. The attribute data that is collected can be used elsewhere. For example, attributes that you add to this event can be selected as criteria when you define a segment. The available attributes vary by event type.

Note: After an event is published, you can add new attributes but you cannot modify existing attributes.

a Click and select the attribute type.

b Define the attribute's properties and return value.

Note: Do not exceed 150 characters for an attribute's name or value.

For the **Return value from** field, select a value based on the type of element:

- For attributes, select the name of the attribute.
- For field values, select **value**.
- For the content of a node, select **innerHTML** or **innerText**, depending on the node type.
- If you use a JavaScript object, you must specify *object.property* in the **Variable name** field. You cannot specify only the object.

c For the **Return** field, specify the part of the return value that you want returned.

d Select an option for **Attribute data type**. For some attribute types, this option cannot be modified.

e (Optional) Select **Personally identifiable information** if the associated data is considered personal information. For some attribute types, this option is not available.

When this option is enabled, the system stores the data in a temporary table. The data is then discarded after it is used by associated tasks.

Note: For email data types, the **Personally identifiable information** option is enabled and cannot be deselected.

12 Define rules to identify attributes for the checkout process (such as the total price). Navigate to **Event Details** ⇨ **Checkout Attributes**.

For each of the categories on this tab, complete these steps:

a Select **Define value**.

b Click and select the element that corresponds to the category. For example, the element might be a cell in a checkout table.

13 Define rules to identify custom attributes for the cart. Navigate to **Event Details** ⇨ **Custom Attributes**.

Note: If you use a JavaScript object, you must specify *object.property* in the **Variable name** field. You cannot specify only the object.

14 On the **Orchestration** tab, complete one of these actions:

- Select **Mark Ready** to change the status from Designing to Ready. A Ready status indicates that this item is ready to be published. When you are ready to promote an item from a Ready status to an Active status, click **Publish**.

  Note: When you publish an item, you are prompted to publish any dependent items that are marked Ready.

  Items with a Ready status can be changed back to a Designing status by clicking **Return to Designing**. Changing this status to Designing prevents the item from being published.

  Note: If your item has a Ready status and a start date, the item is not automatically published when the start date is reached. For example, if you are creating a task, it must be published in order for the start date to activate the task.

- Select **Mark Ready and Publish** to change the status from Designing to Active. Items with an Active status cannot be changed back to Designing.

If the content of a published item is changed and saved, that item becomes out of sync with the published version. To synchronize the content, select **Republish**. Otherwise, the item stays out of sync with the published version and the updates are not delivered.

For more information, see "Republishing Out of Sync Items" on page 138.

15 (Optional) Click ⋮ and select **Properties** to add a name and a description.

16 Publish the event in the data collection configuration. This step is necessary because the event type was previously an advanced collection rule, and the event is still used to populate those data tables.

a From the navigation bar, click **Data Processing**.

b In the Published Status section, click **Publish**.

Creating Click Events

Define an event when a page element is clicked. The page element that a visitor clicks is known as the click target. Link, button, and input elements are valid click targets.

1 Click **Events**.

2 Click .

3 Select **Click**.

4 Navigate to the web page that contains the click target.

5 Select the click target and refine the CSS selector in the **Selector** field.

These elements are supported for click events:

- <a>

- <button>
- <input>. The currently supported type values are `radio` and `button`.

  Note: If you select an <input> element that is inside a form, the resulting event is converted to a form submit event.

Click **Create Event**. You can change or validate the selector anytime from the **Target Location** tab.

6 Refine the pages that are associated with your event by navigating to **Event Details** ⇨ **Event Configuration**.

- Select **Only page where selector was chosen** to include only the page that you selected for the event's location.
- Select **Any page** to include all pages that contain the click target that you defined.
- Select **Pages matching attribute pattern** to define rules that determine which pages to include. You can create a pattern that matches a URL, a domain, or an element.

7 Add attributes to your event by navigating to **Event Details** ⇨ **Event Attributes**.

Adding attributes enables you to collect additional information about the action that triggers the event and the page that contains the event. The attribute data that is collected can be used elsewhere. For example, attributes that you add to this event can be selected as criteria when you define a segment. The available attributes vary by event type.

Note: After an event is published, you can add new attributes but you cannot modify existing attributes.

a Click ➕ and select the attribute type.

b Define the attribute's properties and return value.

Note: Do not exceed 150 characters for an attribute's name or value.

For the **Return value from** field, select a value based on the type of element:

- For attributes, select the name of the attribute.
- For field values, select **value**.
- For the content of a node, select **innerHTML** or **innerText**, depending on the node type.
- If you use a JavaScript object, you must specify *object.property* in the **Variable name** field. You cannot specify only the object.

c For the **Return** field, specify the part of the return value that you want returned.

d Select an option for **Attribute data type**. For some attribute types, this option cannot be modified.

e (Optional) Select **Personally identifiable information** if the associated data is considered personal information. For some attribute types, this option is not available.

When this option is enabled, the system stores the data in a temporary table. The data is then discarded after it is used by associated tasks.

Note: For email data types, the **Personally identifiable information** option is enabled and cannot be deselected.

8 On the **Orchestration** tab, complete one of these actions:

- Select **Mark Ready** to change the status from Designing to Ready. A Ready status indicates that this item is ready to be published. When you are ready to promote an item from a Ready status to an Active status, click **Publish**.

  Note: When you publish an item, you are prompted to publish any dependent items that are marked Ready.

  Items with a Ready status can be changed back to a Designing status by clicking **Return to Designing**. Changing this status to Designing prevents the item from being published.

  Note: If your item has a Ready status and a start date, the item is not automatically published when the start date is reached. For example, if you are creating a task, it must be published in order for the start date to activate the task.

- Select **Mark Ready and Publish** to change the status from Designing to Active. Items with an Active status cannot be changed back to Designing.

If the content of a published item is changed and saved, that item becomes out of sync with the published version. To synchronize the content, select **Republish**. Otherwise, the item stays out of sync with the published version and the updates are not delivered.

For more information, see "Republishing Out of Sync Items" on page 138.

9 (Optional) Click ⋮ and select **Properties** to add a name and a description.

Creating Form Submit Events

1 Click **Events**.

2 Click .

3 Select **Form Submit**.

4 Navigate to the web page that contains the form.

5 Select the form element. The **Selector** field displays the CSS selector for the corresponding element.

Click **Select Parent** or manually edit the selector to change which elements are matched. You can also click **List Forms** to see the available forms on the current page. You can change or validate the selector anytime from the **Form Location** tab.

CAUTION! In the Safari browser, form events are not triggered when the form has no form submit button. This is a known limitation with Safari.

6 Click **Create Event**.

7 Refine which pages to include in this event on the **Event Details** ⇨ **Event Configuration** page. In the **Pages Containing Form** section, select an option for matching the pages.

- Select **Only page where selector was chosen** to include only the page that was displayed when the form was selected.
- Select **Any page** to include all pages that contain the form that you defined.
- Select **Pages matching attribute pattern** to define rules that determine which pages to include. You can create a pattern that matches a URL, a domain, or an element.

8 Select additional fields to use for data collection. Navigate to **Event Details** ⇨ **Form Field Attributes** to see the fields available in the selected form. Select the fields that you want to collect data for when the form is submitted.

9 Add attributes to your event by navigating to **Event Details** ⇨ **Form Attributes**.

Adding attributes enables you to collect additional information about the action that triggers the event and the page that contains the event. The attribute data that is collected can be used elsewhere. For example, attributes that you add to this event can be selected as criteria when you define a segment. The available attributes vary by event type.

Note: After an event is published, you can add new attributes but you cannot modify existing attributes.

a Click + and select the attribute type.

b Define the attribute's properties and return value.

Note: Do not exceed 150 characters for an attribute's name or value.

For the **Return value from** field, select a value based on the type of element:

- For attributes, select the name of the attribute.
- For field values, select **value**.
- For the content of a node, select **innerHTML** or **innerText**, depending on the node type.
- If you use a JavaScript object, you must specify *object.property* in the **Variable name** field. You cannot specify only the object.

c For the **Return** field, specify the part of the return value that you want returned.

d Select an option for **Attribute data type**. For some attribute types, this option cannot be modified.

e (Optional) Select **Personally identifiable information** if the associated data is considered personal information. For some attribute types, this option is not available.

When this option is enabled, the system stores the data in a temporary table. The data is then discarded after it is used by associated tasks.

Note: For email data types, the **Personally identifiable information** option is enabled and cannot be deselected.

10 On the **Orchestration** tab, complete one of these actions:

- Select **Mark Ready** to change the status from Designing to Ready. A Ready status indicates that this item is ready to be published. When you are ready to promote an item from a Ready status to an Active status, click **Publish**.

  Note: When you publish an item, you are prompted to publish any dependent items that are marked Ready.

  Items with a Ready status can be changed back to a Designing status by clicking **Return to Designing**. Changing this status to Designing prevents the item from being published.

  Note: If your item has a Ready status and a start date, the item is not automatically published when the start date is reached. For example, if you are creating a task, it must be published in order for the start date to activate the task.

- Select **Mark Ready and Publish** to change the status from Designing to Active. Items with an Active status cannot be changed back to Designing.

If the content of a published item is changed and saved, that item becomes out of sync with the published version. To synchronize the content, select **Republish**. Otherwise, the item stays out of sync with the published version and the updates are not delivered.

For more information, see "Republishing Out of Sync Items" on page 138.

11 (Optional) Click ⋮ and select **Properties** to add a name and a description.

Creating Page View Events

1 Click **Events**.

2 Click .

3 Select **Page View**.

4 Navigate to the web page that a visitor loads, and click **Create Event**.

5 Refine the pages that are associated with your event by navigating to **Event Details ⇨ Event Configuration**.

- Select **Only page where selector was chosen** to include only the page that you selected for the event's location.
- Select **Any page** to include all pages that contain the click target that you defined.
- Select **Pages matching attribute pattern** to define rules that determine which pages to include. You can create a pattern that matches a URL, a domain, or an element.

6 Add attributes to your event by navigating to **Event Details ⇨ Event Attributes**.

Adding attributes enables you to collect additional information about the action that triggers the event and the page that contains the event. The attribute data that is collected can be used elsewhere. For example, attributes that you add to this event can be selected as criteria when you define a segment. The available attributes vary by event type.

Note: After an event is published, you can add new attributes but you cannot modify existing attributes.

a Click + and select the attribute type.

b Define the attribute's properties and return value.

   Note: Do not exceed 150 characters for an attribute's name or value.

   For the **Return value from** field, select a value based on the type of element:

   - For attributes, select the name of the attribute.
   - For field values, select **value**.
   - For the content of a node, select **innerHTML** or **innerText**, depending on the node type.
   - If you use a JavaScript object, you must specify *object.property* in the **Variable name** field. You cannot specify only the object.

c For the **Return** field, specify the part of the return value that you want returned.

d Select an option for **Attribute data type**. For some attribute types, this option cannot be modified.

e (Optional) Select **Personally identifiable information** if the associated data is considered personal information. For some attribute types, this option is not available.

   When this option is enabled, the system stores the data in a temporary table. The data is then discarded after it is used by associated tasks.

   Note: For email data types, the **Personally identifiable information** option is enabled and cannot be deselected.

7 On the **Orchestration** tab, complete one of these actions:

   - Select **Mark Ready** to change the status from Designing to Ready. A Ready status indicates that this item is ready to be published. When you are ready to promote an item from a Ready status to an Active status, click **Publish**.

     Note: When you publish an item, you are prompted to publish any dependent items that are marked Ready.

     Items with a Ready status can be changed back to a Designing status by clicking **Return to Designing**. Changing this status to Designing prevents the item from being published.

     Note: If your item has a Ready status and a start date, the item is not automatically published when the start date is reached. For example, if you are creating a task, it must be published in order for the start date to activate the task.

   - Select **Mark Ready and Publish** to change the status from Designing to Active. Items with an Active status cannot be changed back to Designing.

   If the content of a published item is changed and saved, that item becomes out of sync with the published version. To synchronize the content, select **Republish**. Otherwise, the item stays out of sync with the published version and the updates are not delivered.

For more information, see “Republishing Out of Sync Items” on page 138.

8 (Optional) Click ⋮ and select **Properties** to add a name and a description.

Creating Product View Events

You can define an event when a visitor views a product on a web page or on a mobile device. You can also add product attributes that collect data about which products are viewed. Use the default set of attributes or define custom attributes. Custom attributes can be added only after the product view event is created.

A product view event is required for web tasks that deliver creatives based on recommendations. For more information, see “Creating a Recommendation Web Task” on page 720.

1 Click **Events**.

2 Click .

3 Select **Product View** as the event type.

4 Select **Page View**.

5 Navigate to the web page that contains the product that you want to define attributes for.

   Note: You can change which page is associated with this product view event from the **Page Location** tab.

6 Click **Select Product Attributes** to define default attributes for the page that is displayed.

7 Select which default attributes to set values for in the **Attribute** list.

   - **Product Name** is a required attribute.

     Note: Product names are limited to 40 characters.

   - Click **Select Parent** to refine the selector.
   - Click **Returned Value** to preview and edit the value that the attribute returns.

8 Click **Create Event**.

9 Refine the pages that are associated with your event by navigating to **Event Details** ⇨ **Event Configuration**.

   - Select **Only page where selector was chosen** to include only the page that you selected for the event’s location.
   - Select **Any page** to include all pages that contain the click target that you defined.
   - Select **Pages matching attribute pattern** to define rules that determine which pages to include. You can create a pattern that matches a URL, a domain, or an element.

10 Define rules for assigning product attributes by navigating to **Event Details** ⇨ **Product Attributes**. You can collect product information such as product ID, SKU, and unit price.

Adding attributes enables you to collect additional information about the action that triggers the event and the page that contains the event. The attribute data that is collected can be used elsewhere. For example, attributes that you add to this event can be selected as criteria when you define a segment. The available attributes vary by event type.

Note: After an event is published, you can add new attributes but you cannot modify existing attributes.

a Click + and select the attribute type.

b Define the attribute's properties and return value.

Note: Do not exceed 150 characters for an attribute's name or value.

For the **Return value from** field, select a value based on the type of element:

- For attributes, select the name of the attribute.
- For field values, select **value**.
- For the content of a node, select **innerHTML** or **innerText**, depending on the node type.
- If you use a JavaScript object, you must specify *object.property* in the **Variable name** field. You cannot specify only the object.

c For the **Return** field, specify the part of the return value that you want returned.

d Select an option for **Attribute data type**. For some attribute types, this option cannot be modified.

e (Optional) Select **Personally identifiable information** if the associated data is considered personal information. For some attribute types, this option is not available.

When this option is enabled, the system stores the data in a temporary table. The data is then discarded after it is used by associated tasks.

Note: For email data types, the **Personally identifiable information** option is enabled and cannot be deselected.

11 Add custom attributes by navigating to **Event Details** ⇨ **Custom Attributes**.

Note: If you use a JavaScript object, you must specify *object.property* in the **Variable name** field. You cannot specify only the object.

12 (Optional) Track when a product is added to a cart by navigating to **Event Details** ⇨ **Add to Cart Action**.

a Select **Identify the add to cart action**. This option is disabled by default.

b Create a click event on page 317 or a form submit event on page 319 to monitor when a customer adds a product to their cart.

c Republish the event when you are finished with other changes.

Add to cart actions are treated similarly to other events, even though they are presented as members of a larger event item. When you modify an add to cart action, the event that uses it must be republished in order to synchronize the event data.

13 On the **Orchestration** tab, complete one of these actions:

- Select **Mark Ready** to change the status from Designing to Ready. A Ready status indicates that this item is ready to be published. When you are ready to promote an item from a Ready status to an Active status, click **Publish**.

  Note: When you publish an item, you are prompted to publish any dependent items that are marked Ready.

  Items with a Ready status can be changed back to a Designing status by clicking **Return to Designing**. Changing this status to Designing prevents the item from being published.

  Note: If your item has a Ready status and a start date, the item is not automatically published when the start date is reached. For example, if you are creating a task, it must be published in order for the start date to activate the task.

- Select **Mark Ready and Publish** to change the status from Designing to Active. Items with an Active status cannot be changed back to Designing.

If the content of a published item is changed and saved, that item becomes out of sync with the published version. To synchronize the content, select **Republish**. Otherwise, the item stays out of sync with the published version and the updates are not delivered.

For more information, see "Republishing Out of Sync Items" on page 138.

14 (Optional) Click ⋮ and select **Properties** to add a name and a description.

15 Publish the event in the data collection configuration. This step is necessary because the event type was previously an advanced collection rule, and the event is still used to populate those data tables.

   a From the navigation bar, click **Data Processing**.

   b In the Published Status section, click **Publish**.

Creating Purchase View Events

Like cart and check-out rules, purchase configurations enable you to collect data on a visitor's shopping experience. Define purchase rules to identify pages such as an order confirmation and the elements that are contained within it.

1 Click **Events**.

2 Click .

3 Select **Purchase View**.

4 Select **Page View**.

5 Navigate to the web page that a visitor loads and click **Create Event**.

Note: You can change which page is associated with this event from the **Page Location** tab.

6 (Optional) Click **Select Row for Product Purchase** to identify the element for each product in the purchase.

Note: You can change this element later by navigating to **Event Details** ⇨ **Purchase Product Attributes**. Then, click to select a new element in the **Purchase row selector** field.

7 (Optional) Click **Select Product Attributes for Purchase** to define default attributes for the product in the purchase.

Note: You can change this attribute later by navigating to **Event Details** ⇨ **Purchase Product Attributes**.

8 Select which default attributes to set values for in the **Attribute** list.

- **Product Name** is a required attribute.

  Note: Product names are limited to 40 characters.

- Click **Select Parent** to refine the selector.
- Click **Returned Value** to preview and edit the value that the attribute returns.

9 Click **Create Event**.

10 Refine the pages that are associated with your event by navigating to **Event Details** ⇨ **Event Configuration**.

- Select **Only page where selector was chosen** to include only the page that you selected for the event's location.
- Select **Any page** to include all pages that contain the click target that you defined.
- Select **Pages matching attribute pattern** to define rules that determine which pages to include. You can create a pattern that matches a URL, a domain, or an element.

11 Define rules to identify attributes for each product being purchased. Navigate to **Event Details** ⇨ **Purchase Product Attributes**.

Adding attributes enables you to collect additional information about the action that triggers the event and the page that contains the event. The attribute data that is collected can be used elsewhere. For example, attributes that you add to this event can be selected as criteria when you define a segment. The available attributes vary by event type.

Note: After an event is published, you can add new attributes but you cannot modify existing attributes.

a Click ✚ and select the attribute type.

b Define the attribute's properties and return value.

Note: Do not exceed 150 characters for an attribute's name or value.

For the **Return value from** field, select a value based on the type of element:

- For attributes, select the name of the attribute.
- For field values, select **value**.

- For the content of a node, select **innerHTML** or **innerText**, depending on the node type.
- If you use a JavaScript object, you must specify *object.property* in the **Variable name** field. You cannot specify only the object.

c For the **Return** field, specify the part of the return value that you want returned.

d Select an option for **Attribute data type**. For some attribute types, this option cannot be modified.

e (Optional) Select **Personally identifiable information** if the associated data is considered personal information. For some attribute types, this option is not available.

When this option is enabled, the system stores the data in a temporary table. The data is then discarded after it is used by associated tasks.

Note: For email data types, the **Personally identifiable information** option is enabled and cannot be deselected.

12 Define rules to identify attributes for the purchase process. Navigate to **Event Details ⇨ Purchase Attributes**.

For each of the categories on this tab, complete these steps:

a Select **Define value**.

b Click and select the element that corresponds to the category.

13 Define rules to identify custom attributes for the purchase. Navigate to **Event Details ⇨ Custom Attributes**.

Note: If you use a JavaScript object, you must specify *object.property* in the **Variable name** field. You cannot specify only the object.

14 On the **Orchestration** tab, complete one of these actions:

- Select **Mark Ready** to change the status from Designing to Ready. A Ready status indicates that this item is ready to be published. When you are ready to promote an item from a Ready status to an Active status, click **Publish**.

  Note: When you publish an item, you are prompted to publish any dependent items that are marked Ready.

  Items with a Ready status can be changed back to a Designing status by clicking **Return to Designing**. Changing this status to Designing prevents the item from being published.

  Note: If your item has a Ready status and a start date, the item is not automatically published when the start date is reached. For example, if you are creating a task, it must be published in order for the start date to activate the task.

- Select **Mark Ready and Publish** to change the status from Designing to Active. Items with an Active status cannot be changed back to Designing.

If the content of a published item is changed and saved, that item becomes out of sync with the published version. To synchronize the content, select **Republish**. Otherwise, the item stays out of sync with the published version and the updates are not delivered.

For more information, see “Republishing Out of Sync Items” on page 138.

15 (Optional) Click ⋮ and select **Properties** to add a name and a description.

16 Publish the event in the data collection configuration. This step is necessary because the event type was previously an advanced collection rule, and the event is still used to populate those data tables.

   a From the navigation bar, click **Data Processing**.

   b In the Published Status section, click **Publish**.

28

Defining Collection Rules and Advanced Events

Defining Basic Collection Rules

About Basic Collection Rules

Basic collection rules are a quick way to set up some of the fundamental rules for data collection. You can define rules to collect information about how to parse page URLs and handle download links.

You can also define exclusion rules to enable or disable collection for specific types of events. For more information, see “Events”.

Note: Be aware of the case for all elements and selectors on your site when you configure rules. This includes form names, IDs, elements, and class names that are used in a CSS selector. For most comparisons, search terms and the page source is converted to lowercase and compared. However, regular expressions are left in their original case to preserve special characters.

Create Rules for Page URLs

The rules for transforming URLs determine how the different parts of a URL are parsed to create collections that are useful in site analysis.

1 From the navigation bar, click **Basic Collection Rules** and select **Page URLs**.

2 Click to create a new rule.

3 On the **Rule to Find Page** tab, define a rule for how the page URL is matched.

> **TIP** If you select **Equals** in the drop-down menu of the **URL domain** section, you can select one or more domains from the **Manage Domains** tab.

4 (Optional) On the **Page URL** tab, define a rule for how you want to transform a page URL. This rule enables you to add or remove parts in the URL. For example, the links to some pages might contain strings that are not useful, but you need to record the rest of the URL. In other cases, you might want to append user-specific information from a cookie or referrer to associate the URL with a specific use case.

   a Select the check box to enable **Transform Page URL**, and the domain entry is created by default.

   Note: For most attributes, you can use regular expressions to capture complex text patterns.

   b (Optional) Click + to add another attribute. A section to define the attribute appears, and an entry for the attribute is added to the page URL.

   To match a page based on its URL, define your criteria based on how you want to parse the URL:

      i Add page attribute for **URL path (entire path)**, and set the value to `profile/ui`.

      ii Add a page attribute for **URL query parameters**. Set the parameter to `returnURL` and the value to `https:%2F%2Fdata.example.com%2FMyLogon%2Flogin%3Fservice%3DaHR0`.

   Note: Be aware of the case for all elements and selectors on your site when you configure rules. This includes form names, IDs, elements, and class names that are used in a CSS selector. For most comparisons, search terms and the page source is converted to lowercase and compared. However, regular expressions are left in their original case to preserve special characters.

c (Optional) Review or modify the page URL that is constructed from your attributes. You can add separators in the fields that are between attributes.

> **TIP** If you select `URL path (entire path)` for a section's **Source attribute** value, typically you should remove the default separator (/) for the attribute sections. Removing the default separator avoids issues where an extra forward slash is added to a URL part that already contains a forward slash.

d Click **Preview Value** to see the final page URL.

For example, assume that you want to transform a URL to remove everything after the string "testurl". Complete these steps on the **Page URL** tab:

a Add these values to the **Domain** section:

Table 28.1 Definition for Domain

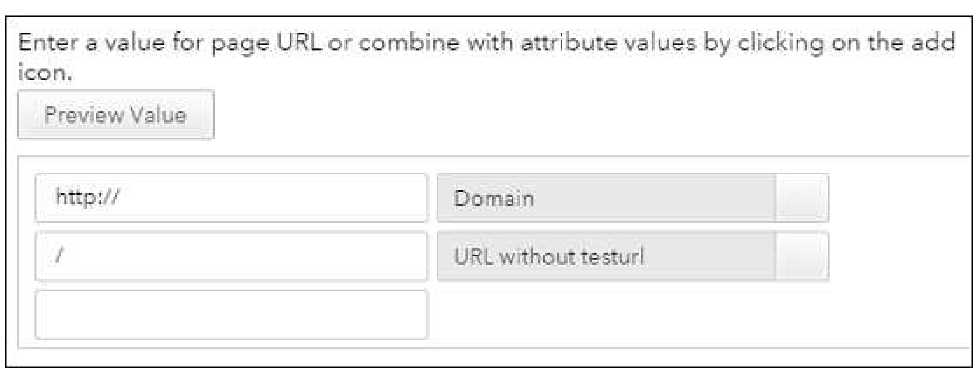
Name	Value
Attribute name	Domain
Source attribute	URL domain

b Add a section called "URL without testurl".

Table 28.2 Attributes for Domain

Name	Value
Attribute name	URL without testurl
Source attribute	URL path (entire path)
Return	After
After	testurl

c Add a forward slash between the attributes in the preview URL.



5 (Optional) On the **Query Parameters** tab, define a rule to keep or remove query parameters from the URL. Like transforming the URL, defining this rule gives you more control over the URL that data collection is associated with.

Use a comma (,) to separate multiple values.

6 Click **Done** to save the rule.

Manage Document Download Types

Specify the types of links that are document download links, rather than active page links that need to be monitored.

1 From the navigation bar, click **Basic Collection Rules** and select **Document Downloads**.

2 Edit the values in the **Document Extensions**, **Query Parameters**, and **JavaScript Functions** sections to define the types of links to handle as a download.

   a Enter one or more extensions for each section. Use a comma (,) to separate multiple values.

   b (Optional) On the **Document URL to Store** tab, define how to store the URL for the download items.

      i Select the check box to enable **Transform download URL**, and the domain entry is created by default.

      ii Click **+** to add another attribute. A section to define the attribute appears, and an entry for the attribute is added to the page URL.

      iii (Optional) Review or modify the download URL that is constructed from your attributes. You can add separators in the fields that are between attributes.

      > **TIP** If you select `URL path (entire path)` for a section's **Source attribute** value, typically you should remove the default separator (/) for the attribute sections. Removing the default separator avoids issues where an extra forward slash is added to a URL part that already contains a forward slash.

      iv Click **Preview Value** to see the final page URL.

      v Click **Done** to save the changes.

Defining Advanced Collection Rules

About Advanced Collection Rules

The advanced collection rules enable you to collect data on common actions by users on your site. These actions are more complex, so simple collection rules might not capture your user's behavior in a way that enables you to see the larger picture. These actions include behaviors such as using shopping carts, filling out specific forms, going through a check-out sequence, or performing a custom business process.

The advanced rules that you can configure align with the model for how the data is stored in the database. In this way, you can easily find the data that you need in the targeting and analytics components of SAS 360 Discover.

Note: When you first start SAS Customer Intelligence 360, no advanced collection rules are defined.

Define Advanced Collection Rules

The procedure to define an advanced collection rule is similar for most types. These are the common steps:

1. From the navigation bar, click **Advanced Collection Rules**.
2. Click and select the type of rule.
3. Define attributes to identify the page or pages that relate to the collection rule. Define attributes that are based on values such as the path, page elements, attributes, and so on.

   To match a page based on its URL, define your criteria based on how you want to parse the URL:

   a. Add page attribute for **URL path (entire path)**, and set the value to `profile/ui`.

   b. Add a page attribute for **URL query parameters**. Set the parameter to `returnURL` and the value to `https:%2F%2Fdata.example.com%2FMyLogon%2Flogin%3Fservice%3DaHR0`.

   Note: Be aware of the case for all elements and selectors on your site when you configure rules. This includes form names, IDs, elements, and class names that are used in a CSS selector. For most comparisons, search terms and the page source is converted to lowercase and compared. However, regular expressions are left in their original case to preserve special characters.

4. Define attributes to identify additional details. This information can come from page elements, page or element attributes, cookie data, and so on. For example, you define rules that capture data such as this:

   - content change on a page
   - changes to the value of a JavaScript variable inside an object
   - form interactions
   - an element ID or the onClick() value for a click event
   - HTML5 custom attributes that exist on an element

   Note: Be aware of the case for all elements and selectors on your site when you configure rules. This includes form names, IDs, elements, and class names that are used in a CSS selector. For most comparisons, search terms and the page source is converted to lowercase and compared. However, regular expressions are left in their original case to preserve special characters.

5 Assign a name for categories or types. You can use either a static term for everything that fits that type, or you can construct the name based on a combination of static terms and attributes that extract information.

   a Click + and define a page load attribute.

   b Click **Preview Value** to see the constructed field name.

6 Click 🖫. Rules are published automatically when they are saved.

Types of Advanced Collection Rules

Business Process

Business processes are a linear sequence of steps that your user is expected to traverse to achieve a final outcome. Define a business process when you are interested in how your users go through these steps, where they repeat a step, and where they drop out. Such a sequence could be an application process for a credit card, registration for an event, a check-out process, and so on. You can also define how to collect error messages that might occur during the process.

Consider these best practices when you define a business process:

- In most cases, define the overall sequence and ignore other page loads between each step. For example, the "purchase" step does not need to happen directly after the "check-out" step, because it is very likely that users continue to shop or review their selections between those two steps. Specify that two steps must be adjacent, or have a maximum number of other pages between them, in rare situations only.
- Distinguish between similar processes that have specific attributes on the **Business Process Attributes** tab. For example, you can define a credit card application process but filter applicants based on the benefits tier (such as gold, silver, or platinum cards).

Note: When you use a content change event to monitor an attribute's value, use the **innerText** option instead of **innerHTML** to match the attribute's value.

For example, you can set up a business process to monitor a cart check-out process.

1 The Table 28.3 table shows some example steps for the check-out process on the **Business Process Steps** tab.

Table 28.3 Order of Business Process Steps

Step	Name	Required or Optional
1	Add to cart	Required
2	View cart	Optional
3	Check-out	Required
4	Confirmation	Required

2 For the Add to cart step, define this information on the **Rules to Find Page** tab:

a In the **Page Attributes** section, select **Any page**.

b In the **Page Event** section, define a **Click** event with these values: **Target: selectorPath Contains** `form.cart > button.single_add_to_cart_button`.

Cart

Cart events are now defined in the **Events** section.

- For more information about web events, see "Creating Cart View Events" on page 312.
- For more information about mobile events, see "Creating Mobile Events" on page 377.

Cart rules that are already defined on the **Advanced Collection Rules** page are read-only.

Check-Outs

Check-out views are now defined in the **Events** section.

- For more information about web events, see "Creating Checkout View Events" on page 315.
- For more information about mobile events, see "Creating Mobile Events" on page 377.

Check-out view rules that are already defined on the **Advanced Collection Rules** page are read-only.

Custom Attribute

Custom attributes provide the capability to collect attributes when there is no predefined place for them in other configurations for SAS 360 Discover. These attributes are collected as name/value pairs. Define what you want to collect, give it a name, and collect the value from the site's page.

For example, if you need to store additional attributes for a product, you can define them as custom attributes in a page's metadata. These attributes can then be extracted and stored as name/value pairs.

The following steps show an example of how to define and collect a custom attribute named "Search Term":

1 Complete these steps on the **Rule to Find Page** tab to find a search field on a page:

a Set the page-matching rule to **Pages matching attribute pattern**.

b In the **Page Attributes** section, set the value for the URL domain to **Any**.

c In the **Page Event** section, create a **Field interaction** event. Set the values for this event to **Field: name Equals** `search`.

2 Define rules on the **Custom Attribute Value** tab to construct the entry for the custom attribute value.

- You can add a prefix or suffix term to construct your attribute name.
- Create an attribute that extracts the search term from a search field.

Table 28.4 Definition for a Custom Attribute Rule

Name	Value
Source attribute	Field interaction event
Event attribute	Field: value
Return	Everything

Form

Form rules record interactions with form fields, including both data input and data submission. SAS Customer Intelligence 360 creates a data record for every text change event (interaction with a form field) and for every field that is included in a form submit record. Advanced collection rules for forms enable you to name your collected data in a more business-friendly or consistent way.

Note: This advanced collection rule creates separate events from web events based on form submits. For more information about web events for forms, see "Creating Form Submit Events" on page 319.

Collected data can contain one or more field interaction events for each field in a form:

- focus event
- change event
- blur event

If a user selects a field, enters a value, and leaves the field, three events are collected:

1. a focus event for selecting the field
2. a change event for entering a value
3. a blur event for leaving the field

In this scenario, a form with 10 fields triggers 30 events. When the user submits the form, a submit event that contains properties for values of all fields in the form is collected.

Data is collected from forms based on these rules:

- Field values are collected whether they are populated by default or explicitly entered. Because users do not explicitly enter default values, field interaction events do not occur and are therefore not recorded. The values for these fields are available in the submit event that is collected when the user submits the form.
- Change events are recorded when users use the autofill function of their browser.
  - Focus and blur events are not recorded, because the cursor never moves to the auto-filled fields.

  - Submit events should contain all the fields in the form, unless the events are configured to be ignored.

- Form submit events use a form's ID attribute as the default identifier. If an ID attribute does not exist, the form's name attribute is used instead.
- Form fields are ignored if they do not have an ID attribute or name attribute.
- Data from hidden form fields is collected.
- When users submit a form where all fields are set to be excluded, the submit event is still collected. The submit event contains the form's ID or name, but it does not contain any field properties.
- Similar to other page elements and selectors, form IDs and field names are case sensitive. A field ID of "FirstName" is different from "firstname".
- In the Safari browser, form events are not triggered when the form has no form submit button. This is a known limitation with Safari.

For example, you can set up a form to find pages that are associated with the shipping address for a user. Do these steps on the **Rule to Find Page** tab:

1. Set the page-matching rule to **Pages matching attribute pattern**.
2. Set these values in the **Page Attributes** section:

Table 28.5 Page Attributes in a Form Rule

Name	Value
URL domain	**Equals** `www.fake.com`
URL path (entire path)	**Equals** `/test/my-account/edit-address/shipping/`
Page elements	**Page forms Form: id Regular expression** `.*`

Goal

Goals define any single action that is completed by a user on your site, such as submitting a form or clicking a call-to-action link. Goals enable you to define specific user actions and track when they are completed.

If no user reaches the goals that you define, then there is no corresponding data in your data collection. Defined goals are not prioritized, so the same event can create multiple records in your data collection if the event matches multiple rules.

Note: The double quotation mark (“) and pound symbol (#) must be escaped with a backslash (\) when they are used in a goal's name or group name, or when they are combined with attribute names in goal configurations.

1. Complete these steps on the **Rule to Find Page** tab:
   a. Set the page-matching rule to **Pages matching attribute pattern**.
   b. Set these sample values for the **Page Attributes** section. The values find the pages for this goal. (In this example, the third level of navigation is associated with a city.)

Table 28.6 Page Attributes in a Goal Rule

Name	Value
URL domain	**Equals** `www.fake2.com`
URL path level 1	**Equals** `citytest`
URL path level 2	**Equals** `product`

c Complete these steps in the **Page Event** sections. In this example, you are extracting the value of the test_page_id JavaScript value from the TestObject object. Assume that TestObject is a JavaScript object on this specific web page.

  i Set the event type to **JavaScript variable change**.

  ii Set the event type to `TestObject.test_page_id` **Contains** `new`.

2 On the **Goal Name** tab, set a value for the goal name.

Construct the name based on the third level of the URL.

  a Create a new attribute, and then select **URL Details ⇨ URL path (by level)**.

  b Define the URL path with these values to get the third level of a URL path:

Table 28.7 Definition for Goal Name in a Goal Rule

Name	Value
Attribute name	URL level 3
Source attribute	URL path (by level)
URL path level	3
Return	Everything

3 On the **Revenue** tab, select the check box for **Define goal revenue value**, and then set a value for the goal name.

Construct a value based on the inner text of a <p> tag that has the "price" class.

Table 28.8 Definition for Revenue in a Goal Rule

Name	Value
Source attribute	Page element
Selection	`p.price`
Return value from	innerText
Return	After last

Name	**Value**
After	`$`

Internal Search

Internal search rules collect data when a visitor uses the search feature on your site to find information. These internal searches enable you to see which content your customers are searching for and to collect the number of search results that are returned.

With this data, you can determine which terms are the most searched for and structure your site appropriately. Also, if some terms return no results, you could add content to your site to direct visitors to a specific area.

You can define multiple internal searches. For example, you can define rules for search forms on different pages, or you can define rules to differentiate between simple and advanced searches. Internal search definitions are not prioritized, though, so if an event matches more than one definition, multiple records are collected for that event.

Note: When you set up an internal search, you can extract the number of search results from the same page as the search or from the next page that loads from the same or next page. When you specify that search results come from the next page, SAS Customer Intelligence 360 collects the results from the next page that is loaded. Extracting the results from the same page is a rare case, because in those cases form submits need to be sent to the server through AJAX.

For example, you can define these rules to record an internal search:

1. Complete these steps on the **Rule to Find Page** tab:

   a. Set the page-matching rule to **Pages matching attribute pattern**.

   b. Set these values in the **Page Attributes** section to locate the search page:

   Table 28.9   Page Attributes for an Internal Search Rule

Name	**Value**
URL domain	**Equals** `www.fake2.com`
URL path level 1	**Equals** `mediatest`
URL path level 2	**Equals** `video-and-audio`

2. Define the search field on the **Search Fields** tab, such as **Field: name Equals `search-field`**.

3. Set a name for the search on the **Search Name** tab.

4. (Optional) Extract the number of search results that are returned on the **Search Results** tab. The following table shows example values for the **Search Results** tab:

Table 28.10 Definition for Search Results in an Internal Search Rule

Name	Value
Define number of search results	Enabled
Search results location	Next page
Source attribute	Page element
Selector	`main#content > header.page-header > h1.archive-title`
Return value from	innerText
Return	Everything

Page Category

Page categories group views of pages for reporting. This enables you to collect and collate data for pages based on similarities that you specify. For example, these similarities can be anything from type of content to metadata values and how a user interacts with them.

Note: Page categories are applied to the original URL, not the transformed URL that you define on the **Page URLs** page.

For example, you can define two categories for the pages that a user loads on SAS.com: pages that were loaded from breadcrumb navigation and pages that were not loaded from breadcrumbs.

1 Set up multiple categories and a fallback value if a page does not match the defined categories.

Table 28.11 Priority Rules in a Page Category Rule

Priority	Name
1	From breadcrumb
2	Non-breadcrumb
Default text	External page

2 For the "From breadcrumb" rule, complete these steps on the **Rule to Find Page** tab:

   a Set the page-matching rule to **Pages matching attribute pattern**.

   b Set these values in the **Page Attributes** section to select a link within a breadcrumb:

Table 28.12 *Page Attributes in a Page Category Rule*

Name	**Value**
URL domain	**Equals** `www.sas.com`
Page elements	`div.breadcrumb > ul > li > a`

c Set the category name on the tab.

Construct the name based on the third element of a breadcrumb.

i Create a new attribute, and then select **Page Content** ⇨ **Page element**.

ii Define the page element with these values:

Table 28.13 *Matching Rules in a Page Category Rule*

Name	**Value**
Attribute name	`3rd_element_of_breadcrumb`
Source attribute	Page element
Selector	`div#wrapper:nth-child(2) > div.breadcrumb:nth-child(2) > ul > li:nth-child(3) > a`
Return value from	innerText
Return	Everything

3 Create another rule for pages that do not come from breadcrumbs. Ensure that the page-matching rules that you define do not overlap with the rules from step 2 on page 341.

Product

Product views are now defined in the **Events** section.

- For more information about web events, see “Creating Product View Events” on page 323.
- For more information about mobile events, see “Creating Mobile Events” on page 377.

Product view rules that are already defined on the **Advanced Collection Rules** page are read-only.

Profile

Profile rules can record a unique identifier of a site visitor. These rules are a good way to segment your users based on their location, source IP address, and so on. For example, you can define rules for user profiles that are based on the user’s browser or operating system (user agent).

When you create rules based on user agents, multiple versions of a product might share the same user agent token. For example, some versions of Microsoft Windows share the same platform token. For more information, see Understanding user-agent strings (external link) on the Microsoft site.

Note: You can only create five profile collection rules.

Complete these steps to create an example profile rule:

1 Create a new profile rule and define multiple rules based on the browsers that you want to match.

Table 28.14 Profile Rule

Priority	Name	Profile Value
1	Firefox	Firefox
2	Google	Google
3	Internet Explorer	Internet Explorer

Also, assign default text for profiles that do not match the rules.

2 For each step, define the rules for how to set the profile value. These steps show how you can use a user agent to determine whether a user is using Mozilla Firefox.

   a Complete these steps on the **Rule to Identify Profile** tab:

      i Enter `Firefox` in the **Name** field.

      ii Create a **User Agent** attribute with the value **Contains** `Firefox`.

   b On the **Profile Value** tab, enter `Firefox` for the value.

Promotion

Promotion rules enable you to collect data on how users interact with your site's in-site advertising, offers, and campaigns. The data can help you determine what the effects and response rates are for promotional activities on the site. Customer interaction can be anything from a simple click-through to something else such as using a promotion code during check-out.

A user visit has only one origination, but there can be many promotions within that visit and even multiple promotions on a single page. Promotions can be internal, such as offers on the home page for free shipping, product recommendations, content recommendations, or discounts that are offered anywhere on the site. Promotions can also be external advertising content that leads people off the page.

Promotions can also change frequently. For rotating advertisements or dynamically created recommendations, the content can be different every time a page loads. For example, users might see different promotions during the same visit if they visit a specific page more than once. By collecting display data and interaction metrics, you can determine the effectiveness of promotions that appear on your site.

For example, you can define rules to track promotions that are displayed in the related products section of a site.

1 Define the rule to find a promotion's pages on the **Display Rule** tab or the **Use Rule** tab.

- Use the **Display Rule** tab to define page elements or page-matching rules.

  In the **Page Attributes** section, set the page-matching rule to **Any page**.

  Add a page element and enter `img.attachment-shop_thumbnail`.

- You can use the **Use Rule** tab to define a more complex rule. Select the **Use different page load rule than display rule** check box to set a separate set of attributes or elements to match. You can also define events.

  Define a click event in the **Page Event** section with the values **Target: selectorPath Contains** `img.attachment-shop_catalog`.

2 On the **Promotion Name** tab, define the name for this promotion.

Define a rule to extract the value for an alt tag of an image. (In this example, the alt tag is associated with a city.) Set these values to extract the city name to add to your promotion name:

Table 28.15 *Definition for Promotion Name in a Promotion Rule*

Name	**Value**
Attribute name	`Promoted City`
Source attribute	Page element
Selector	`img.attachment-shop_catalog`
Return value from	alt
Return	Everything

3 Enter the value for the type on the **Promotion Type** tab.

4 On the **Promotion Placement** tab, define a string that represents where on the page this promotion appears.

Construct a value for the placement based on the title of a page.

Table 28.16 *Definition for Product Placement in a Promotion Rule*

Name	**Value**
Attribute name	Page Title
Source attribute	Page title
Return	Before Last
Before	|

5 Set values on the **Promotion Creative** tab to associate the promotion with a specific creative.

Construct a value for the creative based on the src attribute for the image.

Table 28.17 Definition for Promotion Creative in a Promotion Rule

Name	Value
Attribute name	Image
Source attribute	Page element
Selector	`img.attachment-shop_catalog`
Return value from	`src`
Return	After Last
After	/

6 Set values on the **Promotion Tracking Code** tab to extract a tracking code for a promotion.

Construct a value for the tracking code based on the width attribute for the image.

Table 28.18 Definition for Tracking Code in a Promotion Rule

Name	Value
Attribute name	Tracking Code
Source attribute	Page element
Selector	`img.attachment-shop_catalog`
Return value from	`width`
Return	Everything

7 Set values on the **Response Tracking Details** tab to extract additional response tracking information.

- These values show how to extract a response tracking value from a cookie:

Table 28.19 Extract Response Tracking Details from a Cookie in a Promotion Rule

Name	Value
Source attribute	Cookie
Cookie name	_SI_VID
Return	Everything

- These values show how to extract information from a robots metadata tag:

Table 28.20 Extract Response Tracking Details from Metadata in a Promotion Rule

Name	Value
Source attribute	Meta tag
Meta tag name	robots
Return	Before Last
Before	.

Purchase

Purchase views are now defined in the **Events** section.

- For more information, see "Creating Purchase View Events".
- For more information about mobile events, see "Creating Mobile Events" on page 377.

Purchase view rules that are already defined on the **Advanced Collection Rules** page are read-only.

View

A *view* is a page impression (or a visitor's view of an entire web page). Views enable you to capture page views at specific points in a single page application without requiring a new page load.

Many sites can use AJAX to change a page's content without loading a new HTML page. For example, there could be a product page with tabs for technical details, reviews, and so on. In situations like these, a view could help you collect data when additional content is accessed by a user clicking a tab, or when a hidden <div> element becomes visible as a virtual page view.

For example, you can use these values to define a view:

1 Complete these steps on the **Rule to Find Page** tab:

   a Set the page-matching rule to **Pages matching attribute pattern**.

   b Set these values in the **Page Attributes** section on the **Rule to Find Page** tab to find views at the address `www.fake2.com/tabtest/product`:

   Table 28.21 Page Attributes in a View Rule

Name	Value
URL domain	**Equals** `www.fake2.com`
URL path level 1	**Equals** `tabtest`
URL path level 2	**Equals** `product`

c In the **Page Event** section, define a **Click** event with these values to capture data from views that are on a tab: **Target: selectorPath Ends with** `div.woocommerce-tabs > ul.tabs > li.reviews_tab.active > a`.

2 On the **Page View URL** tab, construct a page view URL that is based on the URL and tab name.

a Define a URL attribute with these values:

Table 28.22 Definition for Page View URL in a View Rule

Name	Value
Attribute name	URL
Source attribute	URL path (entire path)
Return	Everything

b Define a Tab Name attribute with the following values. This action extracts the tab name from the click event that you defined on the **Rule to Find Page** tab.

Table 28.23 Definition for Tab Name in a View Rule

Name	Value
Attribute name	Tab Name
Source attribute	Click event
Event attribute	Target: innerText
Return	Everything

Managing Data Processing Settings

Configure Number Formatting

Set the format that is used for numbers on your website. SAS Customer Intelligence 360 uses this setting to interpret numeric data that is stored in event attributes.

TIP Ensure that the number formatting is set to a value that is expected for all stakeholders. Ideally, you want to establish this setting once and configure web behavioral events and mobile behavioral events to use this value consistently.

To set the number format:

1 From the navigation bar, click **Data Processing** and select **Publishing Settings** ⇨ **Formats Settings**.

2 Select a value for the currency and decimal separator.

3 Publish your changes.

Monitor Data Reprocessing

If a user of an on-premises component requests to reprocess historical data, you can view the details and progress of that request.

To monitor reprocessing:

1 From the navigation bar, click **Data Processing** and select **Processing Settings** ⇨ **Reprocessing**.

2 Review and modify the date selections. This setting overrides date selections that might come through the ETL process.

You can modify or cancel a request for data reprocessing as long as the ETL process has not started. If the ETL process has started, the screen is locked and you cannot cancel or change the reprocessing settings until reprocessing is complete.

Manage ETL Settings

Manage the ETL settings for normalizing and transferring data to on-premises components of SAS Customer Intelligence 360.

Note: This setting applies only to data that is sent to on-premises components. For data that is processed in the cloud, the ETL process runs using an offset value of three hours.

Perform these steps:

1 From the navigation bar, click **Data Processing** and select **Processing Settings** ⇨ **ETL Settings**.

2 Review and modify the settings in the **Reprocessing Settings** section.

   Remove data when reprocessing is detected.

   - Select **Yes** to enable the ETL code to remove the reprocessed data automatically.

   - Select **No** if you do not want the ETL code to remove the reprocessed data. This option is useful when you want to delete data during maintenance windows or slow periods. You might also want to roll back the database and save the time it takes to run the delete statements.

     When you select **No**, SAS Customer Intelligence 360 creates the SQL delete statements in the location that you specify. You must then run the Resume

Reprocessing job when you want to alert the system that the data has been removed.

- Select **Conditional** when you want to specify an amount of data (in days) as a threshold value. If the system has to remove less than that amount of data during reprocessing, it does so automatically. If the system has to remove more than that amount of data, the system does not remove it automatically and behaves as if you selected the **No** option.

Allow reload during initial reprocessing ETL

Select **Yes** to reload the data during the first ETL process. If you select **No**, the first ETL process that detects data reprocessing deletes the data, and the second ETL process starts reloading data. Separating these processes gives you an opportunity to perform database maintenance after the data is deleted.

Note: This option is visible only when you select **Yes** or **Conditional** for the **Remove data when reprocessing is detected** setting, and it disappears if you select **No.**

Reprocessing range

Select **Use ETL date range** so that reprocessing loads the same data volume during each ETL process, as it would during a typical ETL process. If you want to speed up reprocessing and you have the resources available, select **Override ETL range** and choose a higher volume (number of hours per single load) than would normally be loaded during an ETL process.

3. Review and modify the settings in the **General ETL Settings** section.

Maximum hours to process during ETL

Specify the maximum number of hours of data that can be reprocessed during an ETL process.

The ETL process automatically determines the date range of data that needs to be loaded. This range covers all data from the current time to the last time data was loaded into the database. If ETL processes have not been run for some time, or a project is just starting, there could be several days' or weeks' worth of data to process. This setting enables you to preserve resources and temporary disk space by limiting how much data is processed in a single ETL run.

Note: Be aware of this information when setting the maximum hours:

- Ensure that this setting is greater than the frequency that you are running your ETL processes on. If the setting is not greater than the ETL frequency, ETL processing falls behind and is never able to catch up and process current data.
- The default size for normalization jobs is limited to 200 GB. If you need to change this limit, contact your SAS Solutions on Demand (SSOD) representative.

Hour processing offset

Specify the amount of time to allow between a user's session and when the session data can be reprocessed. Most data can be reprocessed up to the last minute, but some data items can be processed only at the end of a user's session. This offset specifies how much time the system waits to account for users to complete their session, so that their final data values can be calculated and processed without conflicts.

4. Publish your changes.

Collecting Data from Media

About Data Collection for Media

When the data collection is configured to collect media events for video or audio player objects that are embedded within a web page, SAS Customer Intelligence 360 adds listeners to these objects and records significant events (for example, start, pause, stop). These events are posted to the collection server with the following attributes:

- media (media source)
- media_action (start, pause, stop)

  Note: If a user closes the browser while a video is playing, the collected data could contain a start event without a corresponding stop event.
- media_duration (duration)
- media_player (player type)
- media_position (time offset of the current video or audio frame)
- player_id (player id)

Note: The number of media events that is collected for each session is limited to a maximum of 200.

SAS Customer Intelligence 360 supports these types of media players:

- "HTML5" on page 349
- "YouTube" on page 350
- "Brightcove" on page 352
- "Open-Source Media Framework" on page 353
- "Silverlight" on page 354
- "Windows Media" on page 355
- "QuickTime" on page 355

HTML5

The WC3 provides an online Editor's Draft of the proposed HTML5 standard. The draft includes a new HTML element, the video element, and a media event model that describes events that are associated with video and audio processing.

This standard event model, whose events are visible from JavaScript, makes it possible for SAS Customer Intelligence 360 to collect video and audio data. In contrast, Flash players generally do not provide a way for JavaScript to query or control the player. Some Flash players provide these access controls, but they do so in ways that are specific to their implementation and are not subject to recognized standards.

Here is a simple example of HTML5 markup that uses the video element to provide an in-page video player:

```
<div>
    <video
      controls preload='none'
      poster="http://us3691.local/media/dragon.png">
      <source id='mp4' src="http://us3691.local/media/dragon.mp4"
              type='video/mp4'>
      <source id='webm' src="http://us3691.local/media/dragon.webm"
              type='video/webm'>
      <source id='ogv' src="http://us3691.local/media/dragon.ogv"
              type='video/ogg'>
      <p>Your browser does not support the HTML5 Video element.</p>
    </video>
    <div id='buttons'>
      <button onclick="play('0')">play()</button>
      <button onclick="pause('0')">pause()</button>
    </div>
</div>
```

YouTube

SAS Customer Intelligence 360 can collect data from YouTube players that are embedded in either iframe or Flash objects.

IFrame

If SAS Customer Intelligence 360 detects an iframe object with a src attribute that contains **`youtube.com/embed`**, it automatically loads the YouTube iframe API. YouTube then calls the onYouTubeIframeAPIReady() callback handler to signify that the players are ready. SAS Customer Intelligence 360 can collect data from each applicable iframe object to listen for significant events.

Here is an example of markup that uses the iframe element:

```
<iframe
    id="ytplayer" type="text/html" width="640" height="390"
    src="http://www.youtube.com/embed/M7lc1UVf-VE?enablejsapi=1"
    frameborder="0"/>
```

To ensure the SAS tag works with an iframe, follow these guidelines:

- Include the enablejsapi parameter in the YouTube URL (enablejsapi=1). This parameter enables interaction between the SAS tag and the YouTube video. If this parameter is not present, SAS Customer Intelligence 360 must add it and reload the video, which might cause playback issues.
- To manage the player object, get the existing object from the YouTube API instead of creating a new player object. Use this method to retrieve the player:

  ```
  YT.get('<iframe_ID>')
  ```

  Avoid situations where you have multiple player objects that are based on the same iframe.

- Check for an existing instance of the onYouTubeIframeAPIReady() function. If the function is already defined, store the function in a queue. When the SAS tag declares onYouTubeIframeAPIReady(), it calls the previous defined functions.

Flash

For YouTube Flash players, the API calls the onYouTubePlayerReady(id) callback handler to signify that a particular player is ready. SAS Customer Intelligence 360 can collect data and listen for significant events from the object that is associated with the ID that you specify in the call.

Here is one example of markup that uses the Flash AS3 object type:

```
<div
   class="left" style="width:100%">
   <object type="application/x-shockwave-flash" id="youtube"
    data="http://www.youtube.com/v/OQWdGxoWcLo?enablejsapi=1&
          playerapiid=youtube&version=3"
    width="560" height="315">
   <param name="allowScriptAccess" value="always"></param>
   </object>
</div>
```

Here is another example of markup that uses the Flash AS3 object type:

```
<div
    class="left" style="width:100%">
    <object>
     <param name="allowScriptAccess" value="always"></param>
     <embed type="application/x-shockwave-flash" id="youtube"
        src="http://www.youtube.com/v/OQWdGxoWcLo?enablejsapi=1&
             playerapiid=youtube&version=3"
        width="560" height="315" allowscriptaccess="always">
     </embed>
    </object>
</div>
```

Notice three important parameters:

- Include the enablejsapi parameter in the YouTube URL (enablejsapi=1). This parameter enables interaction between the SAS tag and the YouTube video. If this parameter is not present, SAS Customer Intelligence 360 must add it and reload the video, which might cause playback issues.
- allowscriptaccess: Set this parameter to "always" to allow the media SWF file to call JavaScript code.
- playerapiid: Use this parameter to designate the Flash object's ID.

  In the first example, notice that the ID is set on the <object> element. In the second example, the ID is set on the <embed> element. The ID that is specified in the playerapiid is passed to the onYouTubePlayerReady(id) callback function that is provided by SAS. This callback function then uses document.getElementById(id) to obtain the object to monitor for the player.

Brightcove

SAS Customer Intelligence 360 can collect data from Brightcove video objects, but you must configure handlers for these objects to notify SAS video processing that a particular object is ready. In the following example, pay attention to how the template handlers are configured.

Here are some code examples of Brightcove video objects:

- This code is an example of a Brightcove player in JavaScript:

```
<script language="JavaScript" type="text/javascript"
        src="http://admin.brightcove.com/js/BrightcoveExperiences.js"></script>

<object id="myExperience2087122601001" class="BrightcoveExperience">
    <param name="bgcolor" value="#FFFFFF" />
    <param name="width" value="480" />
    <param name="height" value="270" />
    <param name="playerID" value="1873162645001" />
    <param name="playerKey"
           value="AQ~~,AAABs_kuvqE~,9q03viSCCi8Qu-ec7KH7e-bapzBTKVDB" />
    <param name="isVid" value="true" />
    <param name="isUI" value="true" />
    <param name="dynamicStreaming" value="true" />
    <param name="@videoPlayer" value="2087122601001" />
    <param name="includeAPI" value="true" />
    <param name="templateLoadHandler" value="onTemplateLoad" />
    <param name="templateReadyHandler" value="onTemplateReady" />
</object>

<script type="text/javascript">
    brightcove.createExperiences();

    var BCL = {};

    function
    onTemplateLoad(id)
    {
      BCL.player = brightcove.api.getExperience(id);
    }

    function
    onTemplateReady()
    {
      new com_sas_ci_acs.SasVideo.Brightcove(
         BCL.player.getModule(
           brightcove.api.modules.APIModules.VIDEO_PLAYER));
    }
</script>
```

- This code is an example of a Brightcove player in HTML5:

```
<video style="width: 610px; height: 334px; position: absolute; top: 0px;
       bottom: 0px; right: 0px; left: 0px;"
       id="myPlayer1"
```

```
            data-video-id="4744690342001"
            data-account="4744530051001"
            data-player="default"
            data-embed="default"
            class="video-js"
            controls>
    </video>
    <script
       src="//players.brightcove.net/4744530051001/default_default/index.min.js">
    </script>
```

Open-Source Media Framework

An open-source media framework (OSMF) object is automatically detected and can collect data if the object has these attributes:

- a type attribute of application/x-shockwave-flash
- a data attribute that contains StrobeMediaPlayback.swf

Here is an example of markup for this type of object:

```
<div>
    <object type="application/x-shockwave-flash"
            id="osmfContainer" name="osmf"
            data="/media/flash/StrobeMediaPlayback.swf"
            width="470" height="320" style="visibility: visible;">
     <param name="flashvars"
      value="src=http%3A%2F%2Fosmf.org%2Fconfigurator%2Fvideos%2Fstrobe.flv&
      javascriptCallbackFunction=onJavaScriptBridgeCreated">
     </param>
     <param name="movie"
      value="/media/flash/StrobeMediaPlayback.swf">
     </param>
     <param name="allowFullScreen"
      value="true">
     </param>
     <param name="allowscriptaccess"
      value="always">
     </param>
     <param name="wmode"
      value="direct">
      </param>
     <embed src="/media/flash/StrobeMediaPlayback.swf"
       type="application/x-shockwave-flash"
       allowscriptaccess="always"
       allowfullscreen="true"
       wmode="direct" width="470" height="320"
       flashvars="src=http%3A%2F%2Fosmf.org%2Fconfigurator%2Fvideos%2Fstrobe.flv">
     </embed>
    </object>
</div>
```

Silverlight

Silverlight is similar to Brightcove in that there must be some intervention to configure a handler that notifies SAS video processing when a specific video object is ready. Silverlight uses extensible application markup language (XAML) to render any number of video objects onto a canvas. Thus, the XAML is expected to contain a top-level <Canvas> element with any number of <MediaElement> children.

Here is an example of markup for a Silverlight object:

```
<div>
   <object id="silverlight"
   data="data:application/x-silverlight-2,"
   type="application/x-silverlight-2"
   width="300" height="240">
        <param name="source" value="silverlight.xaml" />
        <param name="background" value="#d8d8d8" />
        <param name="onload" value="silverlight_loaded" />
   </object>
   <table style="border:0">
        <tr>
            <td style="border:0">
                <button onclick="play_sl()">Play</button>
                <button onclick="pause_sl()">Pause</button>
            </td>
        </tr>
    </table>
    <script language="javascript">

        silverlights = null;

        function
        silverlight_loaded(object)
        {
            createSilverlight(object);
        }

        function
        createSilverlight(object)
        {
            if (window.SasVideo == null)
            {
                setTimeout(function(){createSilverlight(object)},1000);
                return;
            }

            silverlights = SasVideo.addSilverlight(object);
        }

        function
        play_sl()
        {
            silverlights["Silverlight_1"].play();
        }
```

```
        function
        pause_sl()
        {
            silverlights["Silverlight_1"].pause();
        }
    </script>
</div>
```

Here is an example XAML for the Silverlight object:

```
<Canvas xmlns="http://schemas.microsoft.com/client/2007"
        xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml"
        x:Name="OuterCanvas">
    <MediaElement x:Name="Silverlight_1" Stretch="Fill"
                  Source="silverlight.wmv"
                  Grid.Row="0" Grid.Column="0"
                  AutoPlay="False"/>
</Canvas>
```

Windows Media

A Windows Media object is automatically detected and can collect data if the object has a type attribute of application/x-oleobject.

Here is an example of markup for this type of object:

```
<div>
    <object id="MediaPlayer"
            width="506" height="500"
            classid="clsid:6BF52A52-394A-11d3-B153-00C04F79FAA6"
            standby="Loading Windows Media Player components..."
            TYPE="application/x-oleobject">
        <param name="url" value="Wildlife.wmv">
        <param name="autostart" value="false">
    </object>
</div>
```

QuickTime

A QuickTime object is automatically detected and can collect data if the object has a type attribute of **`video/quicktime`**.

Here is an example of markup for this type of object:

```
<div>
    <object id="quicktime"
            type="video/quicktime"
            classid="clsid:02BF25D5-8C17-4B23-BC80-D3488ABDDC6B"
            codebase="http://www.apple.com/qtactivex/qtplugin.cab"
            width="300" height="300">
        <param name="src" value="media/wmv/test.wmv"/>
        <param name="postdomevents" value="true"/>
```

```
        <param name="controller" value="true"/>
        <param name="autoplay" value="false"/>
        <param name="scale" value="aspect"/>
        <param name="moviename" value="my quicktime video"/>
    </object>
<div>
```

Using the JavaScript Events API

The JavaScript Events API enables you to define and send events to SAS 360 Discover and identity events to SAS 360 Engage: Digital. This API gives you full control over which events to send and when to send them. This level of control is in contrast to the default configuration of the SAS tag, which sends a default set of events automatically. The JavaScript Events API is particularly useful when you are working with single-page applications (created with React, Angular, or similar frameworks).

Configure the JavaScript Events API

Send an Event

Before you send an event, you create an event object in JavaScript with parameters and values for the event. The parameters that you define depend on the type of event that you send:

- Each event type has type-specific parameters.
- You can add custom parameters if you need to.
- Parameters can be set as name/value pairs or as name/object pairs.
- The value for every attribute can be obscured. To obscure a value, you set the attribute as a name/object pair and add the “obscured” attribute to the object’s members.

This is an example of a basic event with two parameters:

```
com_sas_ci_acs.ap.i("event", "send",
{
 "event": "<event_type>",
 "attribute_1": "my_value1", // set as a name/value pair
 "attribute_2": {            // set as a name/object pair
   "value": "my_value2",
   "obscured": true
 }
});
```

Note: The number of events that is collected for each session is limited to a maximum of 2,000.

When you submit an event, the JavaScript Events API returns “success” to the console (or standard output stream). If the event has errors, the API returns the validation error.

Event Types

Cart Events

Cart events contain general information about a cart such as the total value, tax, shipping cost, payment type, delivery type, and other shipping and billing information.

Table 28.24 Parameters for Cart Events

Name	Required	Type	Description
event	True	String	The event type. The value must be `cart`.
cart_type	True	String	The type of cart. Use one of these values: ■ `cartview` ■ `checkout` ■ `purchase`
cart_id	True	String, Number	The customer's unique cart ID. The value must be less than or equal to 42 characters. When a customer creates a cart, completes a purchase, or cancels a cart, the same cart ID is associated with all of these actions. The cart_id can be used externally to associate this cart with your external commerce system. Make sure that cart_id values are unique for each customer's cart. REST API calls bypass the internal verification to ensure unique IDs for carts, so give each cart a unique ID to avoid duplicate data records. Note: You must provide a cart_id value, an order_id value, or both.
order_id	True	String, Number	The customer's unique order ID. When a customer completes an order, the order ID is the unique identifier. Make sure that order_id values are unique for each customer's order. REST API calls bypass the internal verification to ensure unique IDs for orders, so give each order a unique ID to avoid duplicate data records. Note: You must provide a cart_id value, an order_id value, or both.
cart_name	True	String	The name of the cart.
billing_city	False	String	The city where the invoice should be sent. The value must be less than or equal to 390 characters.

Name	Required	Type	Description
billing_country	False	String	The country where the invoice should be sent. The value must be less than or equal to 85 characters.
billing_postcode	False	String	The billing code where the invoice should be sent. The value must be less than or equal to 10 characters. For example, in the United States this could be the ZIP code.
billing_region	False	String	The region where the invoice should be sent. The value must be less than or equal to 256 characters. For example, in the United States this could be the state.
delivery_type	False	String	The delivery type. The value must be less than or equal to 42 characters. For example, the value might be “USPS” or “FEDEX”.
payment_type	False	String	The payment type. The value must be less than or equal to 42 characters. For example, the value might be “VISA” or “CHECK”.
shipping_city	False	String	The city where the cart is being shipped. The value must be less than or equal to 390 characters.
shipping_cost	False	Number	The cost of shipping. The value must be an integer or decimal.
shipping_country	False	String	The country where the cart is being shipped. The value must be less than or equal to 85 characters.
shipping_postcode	False	String	The shipping code where the cart is being shipped. The value must be less than or equal to 10 characters. For example, in the United States this could be the ZIP code.
shipping_region	False	String	The region where the cart is being shipped. The value must be less than or equal to 256 characters. For example, in the United States this could be the state.
tax	False	Number	The tax amount. The value must be an integer or a decimal.
total_cart_value	False	Number	The total amount for the cart. The value must be an integer or a decimal.

Name	Required	Type	Description
items	False	Object	A collection of cart items in the cart. For a list of parameters, see Table 28.25.

Cart items contain product information for each row in a cart. Product information includes these item details:

Table 28.25 Parameters for Cart Items

Name	Required	Type	Description
product_id	False	String, Number	The product ID. The value must be less than or equal to 130 characters. Note: You must provide at least one of these parameters: ■ product_id ■ product_name ■ product_sku
product_name	False	String	The product name. The value must be less than or equal to 130 characters.
product_sku	False	String, Number	The SKU value for the product. The value must be less than or equal to 100 characters.
product_quant ity	False	Number	The product quantity. The value must be an integer.
product_unit_ price	False	Number	The unit price of the product. The value must be an integer or a decimal.
product_group	False	String	The product group's name. The value must be less than or equal to 130 characters.
availability_me ssage	False	String	A message related to item availability (for example, "back-ordered"). The value must be less than or equal to 650 characters.
shipping_mes sage	False	String	A message related to the shipping type, process, or special instructions. The value must be less than or equal to 650 characters.
savings_mess age	False	String	A message related to discounts. The value must be less than or equal to 650 characters.

This is an example of a cart event that contains two cart items:

```
com_sas_ci_acs.ap.i("event", "send",
{
 "event": "cart",
 "cart_type": "checkout",
 "cart_id": "02",
 "order_id": "102",
 "cart_name": "test_cart",
```

```
 "billing_city": "Raleigh",
 "billing_country": "US",
 "billing_postcode": "27605",
 "billing_region": "NC",
 "items" : [
    {
     "product_name": "moon boots",
     "product_sku": "344343234",
     "product_quantity": "1",
     "product_unit_price": "35",
     "product_group": "novelty shoes",
     "availability_message": "available",
     "savings_message": "25off"
    },
    {
     "product_name": "penny loafers",
     "product_sku": "344345687",
     "product_quantity": "1",
     "product_unit_price": "65",
     "product_group": "dress shoes",
     "availability_message": "available"
    }
  ]
});
```

Cart-Action Events

Cart-action events track actions related to adding, removing, and updating items in a cart.

Note: When you create a cart-action event, set parameters that are consistent with your external commerce system. It is important to coordinate these parameters with other systems so that analysis and reports are consistent with what you expect.

Table 28.26 Parameters for Cart-Action Events

Name	Required	Type	Description
event	True	String	The event type. The value must be **cartaction**.
action	True	String	The cart action that is performed. Use one of these values: ■ **add** ■ **addFailed** ■ **update** ■ **remove** Note: When you specify the remove action, the cart_type attribute is required.

Name	Required	Type	Description
cart_type	False	String	The cart type associated with this action. Use one of these values: ■ `cartview` ■ `checkout` Note: This attribute is required when the action value is **`remove`**.
product_id	False	String, Number	The ID for the product. The value must be less than or equal to 130 characters. Note: You must provide at least one of these parameters: ■ product_id ■ product_name ■ product_sku
product_name	False	String	The name of the product. The value must be less than or equal to 130 characters.
product_sku	False	String, Number	The SKU value for the product. The value must be less than or equal to 100 characters.
cart_id_internal	False	String, Number	The cart ID. The value must be less than or equal to 42 characters. Note: You must include at least one of these parameters: ■ cart_id_internal ■ cart_name
cart_name	False	String	The cart name.

This is an example of a cart-action event:

```
com_sas_ci_acs.ap.i("event", "send",
{
 "event": "cartaction",
 "product_id": "MN0032",
 "product_sku": "344343234",
 "product_name": "moon boots",
 "action": "add",
 "cart_id_internal": "02",
 "cart_name": "shoes"
});
```

Click Events

About Click Events

Click events are used for a few scenarios:

- to collect a click event that cannot be collected by default.

For example, you might have a Goal defined for click events with a Target:id attribute that starts with "callback”. There could be 10 links that are collected automatically by the system and two that are not. For those two links that are not monitored, you could send a click event through the API. This click event could mimic a system click event and provide the necessary attributes for the Goal definition.

- to send a click event that is customized for an advanced collection rule or event in the user interface (such as a business process, promotion, or custom attribute rule). In this case, you use the JavaScript Events API to send a click event, but you define an advanced collection rule or event in the user interface that receives the data from the API.

  When you define the associated event or collection rule, make sure the attributes that you define match the parameters that are sent with the click event. The table Table 28.27 describes the most-used parameters and the attributes in the user interface that they map to.

  TIP In addition to the parameters in the table, you can send any other parameters as needed. Parameter names should match attributes that are present in an advanced collection rule or event that is defined in the user interface.

Here are the parameters for this event type:

Table 28.27 Parameters for Click Events

Name	Required	Type	Description
event	True	String	The event type. The value must be `click`.
anchor_id	False	String, Number	The ID of an anchor. This parameter maps to the Target:id attribute in the user interface.
anchor_name	False	String	The name of an anchor. This parameter maps to the Target:name attribute in the user interface.
element_tag_name	False	String	The name of the element that was clicked. This parameter maps to the Target:tagName attribute in the user interface.
location	False	String	The location of the element that was clicked. For example, this value could be coordinates on the page. This parameter can be useful when mimicking a system-generated click event.
on_click	False	String	The onClick value. This parameter maps to the Target:onclick attribute in the user interface.
port	False	String	The port used on the page. This parameter can be useful when mimicking a system-generated click event.

Name	Required	Type	Description
protocol	False	String	The transport protocol for the page. The default value is `http`. This parameter can be useful when mimicking a system-generated click event.
referrer	False	String	The referral information. This parameter can be useful when mimicking a system-generated click event.
target_alt_text	False	String	The value of an element’s alt text attribute. This parameter maps to the Target:alt attribute in the user interface.
target_inner_text	False	String	The inner text of the element. This parameter maps to the Target:innerText attribute in the user interface.
target_selector_path	False	String	The selector path for the target. This parameter maps to the Target:selectorPath attribute in the user interface.
title	False	String	The title of the page. This parameter can be useful when mimicking a system-generated click event.
<custom attributes>	False		A name/value pair that defines any additional data that you want to send. To use these parameters in the user interface, the parameter names must follow these guidelines: ■ The parameter must start with “data-”. For example, a parameter name could be `data-arrival-airport`. ■ The parameter must contain only alphanumeric characters, hyphens (-), and spaces. These parameters map to a target:HTML5 custom data attribute in the user interface.

Note: The URI is sent automatically and is set to the URL of the current page. The URI value maps to the target:href attribute in the user interface.

Example: Click Event Used as a Custom Event

In this example, you want to use the JavaScript Events API to send a click event that records information about a flight booking.

In this case, you decide to map a flight’s information to a click event’s basic parameters. For example, the click event might look like this:

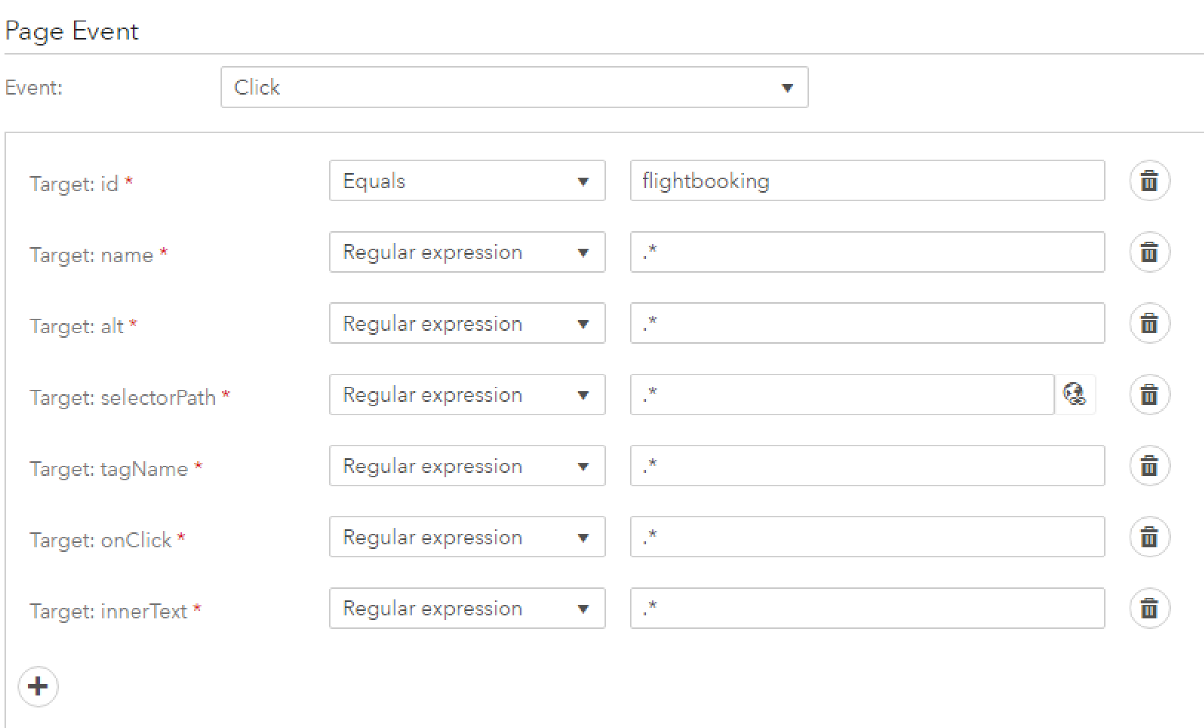
```
com_sas_ci_acs.ap.i("event", "send", {
  "event": "click",
```

```
  "anchor_id": "flightbooking",           // this is a fixed string that will be used in
                                          //   advanced collection rule
  "anchor_name": "RDU",                   // the departure airport
  "target_alt_text": "LHR",               // the arrival airport
  "target_selector_path": "SAS Airlines", // the airline
  "element_tag_name": "2019-12-25",       // the departure date
  "on_click": "18:05",                    // the departure time
  "target_inner_text":"Economy"           // the class of travel
});
```

In the user interface, you would then define a Goal in **Advanced Collection Rules**. In the **Page Event** section, complete these steps:

1. Select **Click** from the **Event** menu.
2. Add the Target:id attribute and specify that the attribute's value must equal **`flightbooking`**. This action ensures you are receiving data from the correct click event.
3. Define the other attributes based on how they map to the parameters from the API. Use Table 28.27 for reference. When you define matching rules for these attributes, you can match on anything (if you have only one "flightbooking" rule) or specifics (for example, you could have multiple rules defined that are differentiated by the airline).

This is an example of the Page Event section of a Goal that matches the click event:



Example: Click Event with HTML5 Custom Data Attributes

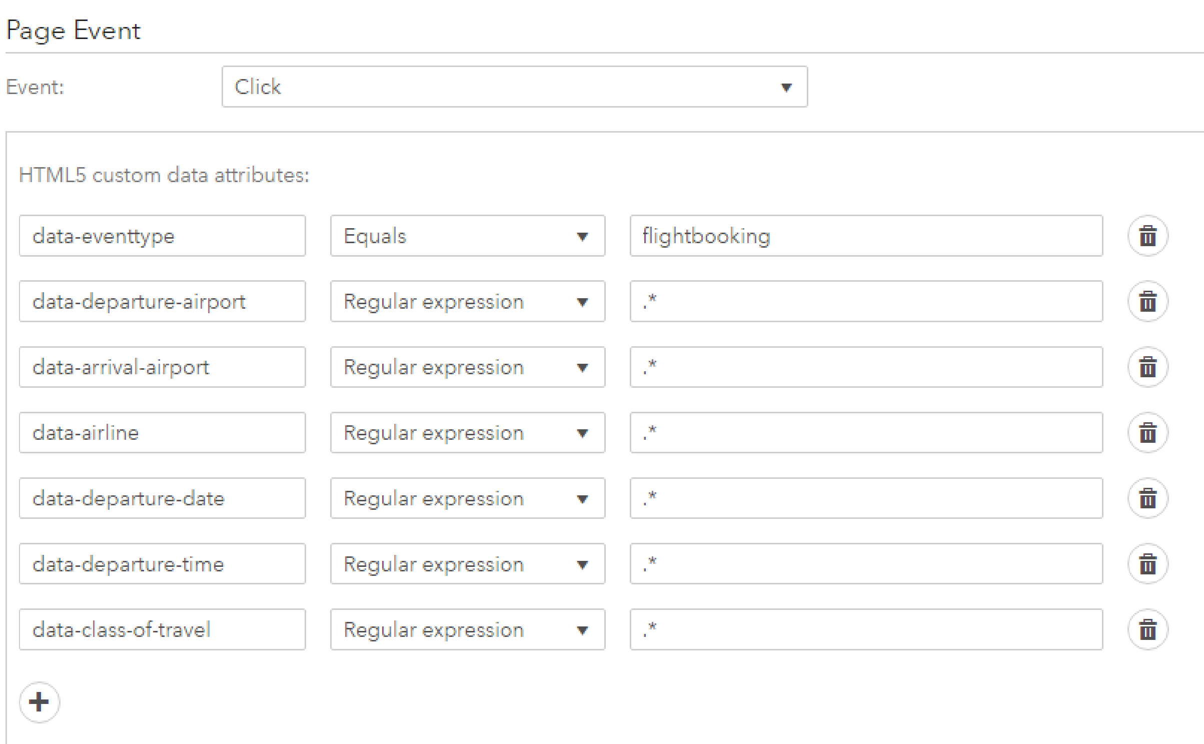
Using the same scenario as the previous example, you could make the data more user-friendly by using HTML5 custom attributes. Instead of using the built-in parameters, you could define the click event like this:

```
com_sas_ci_acs.ap.i("event", "send", {
  "event": "click",
  "data-eventtype": "flightbooking",
  "data-departure-airport": "RDU",
  "data-arrival-airport": "LHR",
  "data-airline": "SAS Airlines",
  "data-departure-date": "2019-12-25",
  "data-departure-time": "18:05",
  "data-class-of-travel": "Economy"
});
```

In the user interface, you would then define a Goal in **Advanced Collection Rules**. In the **Page Event** section, complete these steps:

1. Select **Click** from the **Event** menu.
2. Add the Target:id attribute and specify that the attribute's value must equal **`flightbooking`**. This action ensures you are receiving data from the correct click event.
3. Create an HTML custom data attribute. Set the name to **`data-eventtype`** and specify that the attribute's value must equal **`flightbooking`**.
4. Define the other attributes as HTML5 custom data attributes.

This is an example of the Page Event section of a Goal that matches the click event:



Content Change Events

Content change events track when the content of a web page changes. Here are the parameters for this type:

Table 28.28 Parameters for Contentchange Events

Name	Required	Type	Description
event	True	String	The event type. The value must be **contentchange**.
attribute_name	False	String	The name of an attribute that is associated with the event.
event_id	False	String	An ID for the event.
event_uid	False	String	A UID for the event. A UID is an ID that is globally unique across your website or app. By contrast, an event_id might be an ID that is used across multiple pages.
event_source	False	String	The source of an event.
new_value	False	String	The new value for an element or attribute.
old_value	False	String	The previous value for an element or attribute.
target_name	True	String	The name of the target that is associated with the event.
target_selector	True	String	The selector information of the target that is associated with the event.
target_id	False	String, Number	The ID of the target that is associated with the event.
target_type	False	String	The type of content change. The value must be one of these strings: ■ **attribute** ■ **childadd** ■ **childremove**

This is an example of a content change event:

```
com_sas_ci_acs.ap.i("event", "send",
{
 "event": "contentchange",
 "target_selector": "div",
 "target_name": "content_div",
 "event_id": "45",
 "event_uid": "12458796"
});
```

Identity Events

Identity events track when a customer identifies him or her self (for example, by signing in). An identity event from the JavaScript Events API can replace or supplement identity events in the user interface. You do not need to perform additional configuration steps to ensure these identity events work with corresponding events in the user interface.

Here are the parameters for this type:

Table 28.29 Parameters for Identity Events

Name	Required	Type	Description
event	True	String	The event type. The value must be **IdentityEvent**.
login_event	True	String	The value of the login event, such as the customer ID or login ID. Use object/value pairs if you need to obscure sensitive information. See the example after this table.
login_event_type	True	String	The type of identity. Use one of these values: ■ **customer_id** ■ **login_id** ■ **email_id** Note: This value is deprecated. In most cases you should use one of the other values.

This is an example of an identity event:

```
com_sas_ci_acs.ap.i("event", "send",
{
 "event": "IdentityEvent",
 "login_event": "sample_email@server.com",
 "login_event_type": "login_id"
});
```

This is an example of an identity event that uses an obscured email address:

```
com_sas_ci_acs.ap.i("event", "send",
{
 "event": "IdentityEvent",
 "login_event": {
   "value":"sample_email@server.com",
   "obscured":true
  },
 "login_event_type": "login_id"
});
```

Impression-related Events

Impression-related events enable you to track when a creative is used on your web page. These events are used to complement scenarios in which you need more control over how content is displayed on your page and how users can interact with it.

There are three types of events that you can send with the JavaScript API:

- Impression (spot change) events track when a creative is delivered by SAS Customer Intelligence 360. Impression events do not typically take into account whether a user actually views the content or interacts with it.
- Impression viewable (spot viewable) events track when a creative is displayed in your content. How you define "viewable" can be specific to your needs. For example, you might decide that a creative is viewable when a user scrolls past its position on the page.
- Impression click (spot click) events track when a user interacts with content in a spot. You can send only 50 impression click events for each user session.

Note: When you trigger these types of events, you need to set up your environment to avoid conflicting behavior. Enable **Web content injected by custom JavaScript** in the **Page and Session** settings page.

This action ensures that SAS Customer Intelligence 360 does not automatically inject content into spots and the related impression events are not triggered by the SAS tag. For more information, see "Inject HTML Content".

Here are the parameters for these impression event types:

Table 28.30 Parameters for Impression-related Events

Name	Required	Type	Description
event	True	String	The event type. Set the value based on the event type: ■ For impression (spot change) events, set the value to `spot_change`. ■ For impression viewable (spot viewable) events, set the value to `spot_viewable`. ■ For impression click (spot click) events, set the value to `spot_click`.
spot_id	True	String	The ID of the spot on the page.
creative_id	True	String	The ID of the creative that was delivered, viewed, or clicked.
task_id	True	String	The ID of the associated task.
variant_id	False	String	The ID of the creative's variant, if applicable.

This is an example of an impression (spot change) event:

```
com_sas_ci_acs.ap.i("event", "send",
{
  "event": "spot_change",
  "spot_id": "d57d4ad1-1b3b-42f6-9bf5-4b163480ed16",
  "creative_id": "48a4f271-03cd-48d4-ab08-c048b6ed5999",
  "task_id": "bb9606fd-1a8c-458d-845a-ea7d3cbf8bf2"
});
```

JavaScript Variable Change Events

JavaScript variable change (jsvarchange) events track when a JavaScript variable changes on a web page. Here are the parameters for this type:

Table 28.31 Parameters for Jsvarchange Events

Name	Required	Type	Description
event	True	String	The event type. The value must be **jsvarchange**.
action	True	String	Specifies how the variable has changed. Use one of these values: ■ **add** ■ **update** The default value is **update**.
name	True	String	The name of the variable that changed.
new_value	True	String, Number	The new value of the variable.
old_value	False	String, Number	The previous value of the variable.

This is an example of a jsvarchange event:

```
com_sas_ci_acs.ap.i("event", "send",
{
 "event": "jsvarchange",
 "name": "isLoggedIn",
 "action": "update",
 "old_value": "false",
 "new_value": "true"
});
```

Logout Events

Logout events enable you to send a JavaScript call to the system that logs out the current user. This feature enables you to recategorize the user as an anonymous visitor so that creatives and messages are no longer customized with merge tags associated with the known identity.

When you send a logout event, SAS Customer Intelligence 360 performs these steps:

1 Disassociates the visitor ID from the identity ID.

2 Requests a new identity ID. This new identity ID is anonymous, so it has no merge tags or uploaded data associated with it.

3 Associates all subsequent events with the new anonymous identity ID.

This is an example of a logout event:

```
com_sas_ci_acs.ap.i("event", "send",{
  "event": "logout"
});
```

Logout events have no additional parameters.

Media Events

Media events track when a customer interacts with a media element. Here are the parameters for this type:

Table 28.32 Parameters for Media Events

Name	Required	Type	Description
event	True	String	The event type. The value must be **media**.
media	True	String	The name or type of media. The value must be less than or equal to 260 characters.
media_action	True	String	The action that took place. Use one of these values: ■ start ■ stop ■ end ■ playing
media_duration	True	Number	The length of the media. The exact format and value of this attribute depend on the values returned by the media player, but the value should be submitted as an integer or decimal.
media_position	True	Number	The current position of the playback controller. The exact format depends on the values returned by the media player, but the value should be submitted as an integer.
media_player	False	String	A string or number that identifies the media player. The value must be less than or equal to 30 characters.
player_id	True	String	The ID of the media player's element.

Note: The number of media events that is collected for each session is limited to a maximum of 200.

This is an example of a media event:

```
com_sas_ci_acs.ap.i("event", "send",
{
 "event": "media",
 "player_id": "154254",
 "media": "intro_video",
 "media_player": "Brightcove",
 "media_position": "314",
 "media_duration": "720",
 "media_action": "start"
});
```

Submit Events

About Submit Events

Submit events track when a customer submits a form. When you send a submit event with the API, the data is sent directly to the FORM_DETAILS table. You do not need to perform additional configuration steps to populate data in that table.

In addition, submit events can be used in combination with other events or advanced configurations. For example, you can use a submit event as part of a business process or goal. For an example, see "Example: Customer Feedback Form in a Goal".

Here are the parameters for this type:

Table 28.33 Parameters for Submit Events

Name	Required	Type	Description
event	True	String	The event type. The value must be `submit`.
form_h_id form_h_name form._o_id	True	String	An ID or name for the form. These parameters can be used to trigger collection rules (such as a goal or business process) that depend on the form ID or name. Tip: For best results, include all three parameters and set them to the same value. If you have a goal or business process that is based on this event: ■ the form ID in your rule is compared with the form_h_id value from this event ■ the form name in the rule is compared with the _form_h_name value from this event
form._o.attem pts	True	Number	The number of attempts or submitting the form. The value must be an integer. To maintain an accurate count, increment a count variable for each attempt and use that value for this property.
Field-specific parameters	True		One or more parameters for a field. Note: Submit events must include parameters for at least one form field. See Table 28.34 for these parameters.

To send information about the fields in a form, you must include a set of parameters for each field. For each field, set these parameters:

***Table 28.34** Field Parameters for Submit Events*

Name	Required	Type	Description
form.f.<*field_name*>._h.name	True	String	The name or ID of a form field.
form.f.<*field_name*>._o.changes	True	Number	The number of times (as an integer) that a form field is changed before the form is submitted. To maintain an accurate count, increment a count variable for each attempt and use that value for this property. Tip: In cases where you cannot determine this value, it can be set to `1`.
form.f.<*field_name*>	False	String	The value of a form field. Use object/value pairs if you need to obscure sensitive information. For example, this name/value pair defines the value for the userId field: `"form.f.userId": "myUserID"`
form.f.<*field_name*>._h.type	False	String	The type of value expected for a form field.

TIP When you construct the field-specific form parameters, ensure that there are no extra spaces between the parameter name and the quotation marks. Extra spaces can cause the field value to be ignored.

This is an example of a submit event:

```
com_sas_ci_acs.ap.i("event", "send", {
  "event": "submit",
  "form._o.id": "simple_form",
  "form_h_id": "simple_form",
  "form_h_name": "simple_form",
  "form._o.attempts": 1,
  "form.f.Q1FavoriteColor._h.name": "Q1FavoriteColor",
  "form.f.Q1FavoriteColor": $scope.Q1,
  "form.f.Q1FavoriteColor._o.changes": 1,
});
```

Example: Customer Feedback Form in a Goal

In this example, you want to send a submit event that contains data from a customer feedback form. You also want to define a Goal to record when this form is submitted.

For each field in the form, you must send this information:

- the field’s name
- the field’s value
- the number of changes made to the field. (This value will be set to `1` for simplicity.)

This is an example of a submit event that captures this information from a customer feedback form with seven questions:

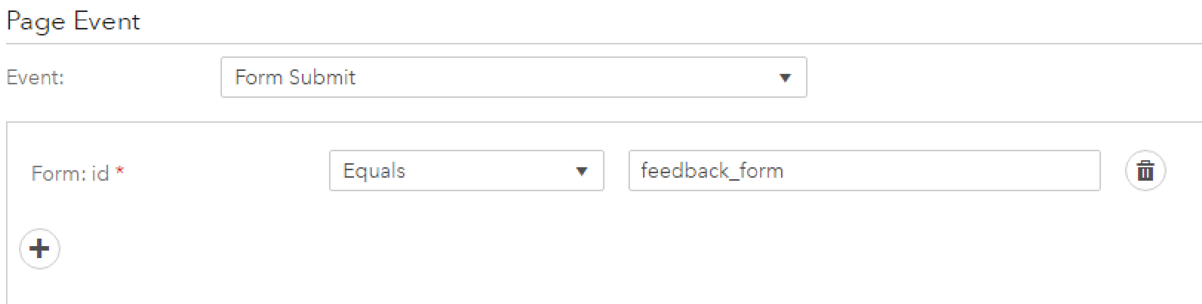
```
com_sas_ci_acs.ap.i("event", "send",
  {
    "event": "submit",
    "form._o.id": "feedback_form",
    "form_h_id": "feedback_form",
    "form_h_name": "feedback_form",
    "form._o.attempts": 1,
    "form.f.Q1HowSatisfiedWereYou._h.name": "Q1HowSatisfiedWereYou",
    "form.f.Q1HowSatisfiedWereYou": $scope.Q1,
    "form.f.Q1HowSatisfiedWereYou._o.changes": 1,
    "form.f.Q1a._h.name": "Q1a",
    "form.f.Q1a": $scope.Q1a,
    "form.f.Q1a._o.changes": 1,
    "form.f.Q2._h.name": "Q2",
    "form.f.Q2": $scope.Q2,
    "form.f.Q2._o.changes": 1,
    "form.f.Q2a._h.name": "Q2a",
    "form.f.Q2a": $scope.Q2a,
    "form.f.Q2a._o.changes": 1,
    "form.f.Q3._h.name": "Q3",
    "form.f.Q3": $scope.Q3,
    "form.f.Q3._o.changes": 1,
    "form.f.Q4._h.name": "Q4",
    "form.f.Q4": $scope.ratedBy,
    "form.f.Q4._o.changes": 1,
    "form.f.Q5._h.name": "Q5",
    "form.f.Q5": $scope.Q5,
    "form.f.Q5._o.changes": 1,
    "form.f.Q6._h.name": "Q6", /* if this field is an email,  you might want to obscure i
    "form.f.Q6": $scope.Q6,
    "form.f.Q6._o.changes": 1,
    "form.f.Q7._h.name": "Q7",
    "form.f.Q7": $scope.country,
    "form.f.Q7._o.changes": 1
});
```

In the user interface, you would then define a Goal in **Advanced Collection Rules**. In the **Page Event** section, complete these steps:

1 Select **Form Submit** from the **Event** menu.

2 Add the Form:id attribute and specify that the attribute’s value must equal **`feedback_form`**.

This is an example of the Goal’s Page Event section:



When you send the submit event with the JavaScript Events API, the Goal in the user interface captures this event and is recorded.

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Email Events

About Email Events

Email events capture specific information about how your recipients interact with email content, such as how many recipients received, opened, clicked, or viewed a link in your email.

By default, all email events are captured for all of the recipients. You do not need to perform any additional tasks to capture the data for email events. Use email events to trigger a task or define a segment, or combine them with other events in a data view on page 459. You can track email tasks based on the data that is captured. For more information, see " Monitor Your Email Task" on page 599.

These types of email events are captured:

Send event
: defines an event when an email is sent to a recipient.

Open event
: defines an event when an email recipient opens the email.

Click event
: defines an event when a call-to-action link is clicked by an email recipient. A call-to-action link is a hyperlink in an email message.

View event
: defines an event when an email recipient views the web version of the email content in a browser.

Reply event
: defines an event when an email recipient replies to an email.

Complaint event
: defines an event when a complaint is registered by an email recipient. A complaint might be registered when the recipient marks the email as spam. A spam event is treated as an opt-out event and the recipient is automatically opted out from receiving further emails.

Note: Some Internet service providers might not return information about a complaint event such as spam.

Hard bounce event
: defines an event when a recipient does not receive the targeted email, and the email bounces back. Possible reasons are an incorrect email ID or an incorrect domain.

Opt-out event
: defines an event when a recipient clicks the unsubscribe or opt-out link in the email to discontinue receiving further emails.

Note: As a marketer, you can customize an opt-out message that is viewed by your recipients. For more information, see "Add Opt-Out Text" on page 584.

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Mobile Events

Creating Mobile Events

Use mobile events to define an event when a visitor interacts with a mobile application.

Create Events

To create a mobile event:

1. From the **navigation bar**, click **Events**.
2. Click .
3. Select **Mobile**.
4. Specify the application where the event occurs. Click **Create Event**.
5. On the **Event Details** ⇨ **Action Details** tab, specify the application where the event occurs and provide a unique event ID.
   - Click if you want to change the associated application.
   - Enter a unique event ID. For best results, create an event ID that is similar to the corresponding event name. For example, if your event name is *Coupon Activated*, you might use the event ID *Coupon_Activated*.
6. Navigate to the **Event Details** ⇨ **Event Attributes** tab to specify custom event attributes.

   Custom attributes can be used to collect additional information about the action that triggers the event. This information can help you understand when and where to use the event. The attribute data that is collected can be used elsewhere. For example, attributes that you add to this event can be selected as criteria when you define a segment. The available attributes vary by event type.

To add an attribute:

a Click +.

b Enter a name and select a data type.

c (Optional) If the associated data is considered personal information, select the check box next to **Personally identifiable information**.

When this option is selected, the system stores the data in a temporary table. The data is then discarded after it is used by associated tasks.

Note: For email data types, the option is enabled and cannot be deselected.

7 Click . Enter a name for the event, and then click **Save**.

8 If you are ready to publish the event, which makes the event available to a task, navigate to the **Orchestration** tab and update the status.

- Select **Mark Ready** to change the status from Designing to Ready.

  Items with a Ready status can be changed back to a Designing status by clicking **Return to Designing**. Changing this status to Designing prevents the item from being published.

- Select **Mark Ready and Publish** to change the status from Designing to Active. Items with an Active status cannot be changed back to Designing.

9 If you want to make the event available for use in external systems, navigate to the **Orchestration** ⇨ **External Availability** tab. Select the access points (or agents) that you want to send the event to.

Manage Events

Rename, Delete, and Edit an Event

From the **Events** page, you can rename, delete, and open (for editing) an event.

Note: Because a mobile event requires a unique event ID, you cannot copy an event.

To access the options, select the event in the list, and then select the appropriate action.

- To rename the event, click ⋮ and select **Rename**.

  You can rename an event regardless of its status. The new name is reflected in all tasks that include the event. If you rename an event that is published, the event becomes out of sync and must be republished.

  > **TIP** After you rename an event that is included in an open task, when you return to the task, you might need to click to see the change.

- To open the event for editing, click .

Alternatively, click the event name in the list.

- To delete the event, click 🗑.

  You can delete an event that is published. You cannot delete an event that is included in a task. When you delete an event, the event is removed from the events repository.

Change the Status

To change the status, open the event and navigate to the **Orchestration** tab. Depending on the status of the event, these are the options in the status list:

- **Mark Ready**: Changes the status from Designing to Ready. This option indicates that the event is ready to be published.
- **Return to Designing**: Changes the status from Ready back to Designing.
- **Publish**: Changes the status from Ready to Active. When you publish an item, you are prompted to publish any dependent items that are marked Ready.
- **Republish**: Changes the status from Out of Sync back to Ready. If the content of a published item is changed and saved, that item becomes out of sync with the published version. To synchronize the content, select **Republish**. Otherwise, the item stays out of sync with the published version and the updates are not delivered.

  For more information, see “Republishing Out of Sync Items” on page 138.
- **End**: Changes the status from Active to Completed. Completed events cannot be included in a task and cannot be modified. Only an event that is not currently in use by a task can be completed. Ending an event stops any associated data collection and makes the event's content unavailable. In addition, any unsaved changes to the event are lost.

View Usage Information

From the **Orchestration** ⇨ **Usage** tab, you can view which items use the event.

The ability to view dependencies between items enables you to see the items that a task depends on to work successfully. Usage information helps you identify how changes that you make to one item might affect another item.

Items That Use the Event

The first section shows the items that use the event. For example, if the event is used in a task, the task is included in the list.

The Priority column displays the priority of like tasks that use the event. Priority applies only to mobile spot, web spot, and mobile in-app message tasks because each of those task types might have two or more tasks that compete for the same resources. Other task types do not use prioritization.

For non-A/B test tasks, priority is on a scale of 1 through 5 (where 1 is the highest). The default is 3. An A/B test task has a priority of Test, which is higher than a non-A/B test task. An A/B test task always delivers its content.

You can change the priority of a non-A/B test task on the task’s **Orchestration** ⇨ **Priority** tab.

To open an item, click the item. To view item details and to open the item, click ⓘ in the item's row.

Items That the Event Uses

The second section shows items that the event uses. Because an event does not use another item, the list is empty.

Creating Mobile Product View Events

Use mobile events to define an event when a visitor interacts with a mobile application.

Create Events

To create a mobile product view event:

1. From the **navigation bar**, click **Events**.
2. Click .
3. Select **Product View**.
4. Click **Mobile App Action**.
5. Specify the application where the event occurs. Click **Create Event**.
6. On the **Event Details** ⇨ **Event Configuration** tab, specify the application where the event occurs and provide an event ID.
   - Click if you want to change the associated applications.
   - Enter a unique event ID. For best results, create an event ID that is similar to the corresponding event name. For example, if your event name is *Coupon Activated*, you might use the event ID *Coupon_Activated*.
7. Navigate to the **Event Details** ⇨ **Product Attributes** tab to specify which product attributes to include with the event.

   Adding attributes enables you to collect additional information about the action that triggers the event and the page that contains the event. The attribute data that is collected can be used elsewhere. For example, attributes that you add to this event can be selected as criteria when you define a segment. The available attributes vary by event type.
8. Navigate to the **Event Details** ⇨ **Custom Attributes** tab to specify custom event attributes.
   a. Click **+**.
   b. Enter a name and select a data type.
   c. (Optional) If the associated data is considered personal information, select the check box next to **Personally identifiable information**.

When this option is selected, the system stores the data in a temporary table. The data is then discarded after it is used by associated tasks.

Note: For email data types, the option is enabled and cannot be deselected.

9 Click . Enter a name for the event, and then click **Save**.

10 If you are ready to publish the event, which makes the event available to a task, navigate to the **Orchestration** tab and update the status.

- Select **Mark Ready** to change the status from Designing to Ready.

  Items with a Ready status can be changed back to a Designing status by clicking **Return to Designing**. Changing this status to Designing prevents the item from being published.

- Select **Mark Ready and Publish** to change the status from Designing to Active. Items with an Active status cannot be changed back to Designing.

11 If you want to make the event available for use in external systems, navigate to the **Orchestration** ⇨ **External Availability** tab. Select the access points (or agents) that you want to send the event to.

Manage Events

Rename, Delete, and Edit an Event

From the **Events** page, you can rename, delete, and open (for editing) an event.

Note: Because a mobile event requires a unique event ID, you cannot copy an event.

To access the options, select the event in the list, and then select the appropriate action.

- To rename the event, click ⋮ and select **Rename**.

  You can rename an event regardless of its status. The new name is reflected in all tasks that include the event. If you rename an event that is published, the event becomes out of sync and must be republished.

  > **TIP** After you rename an event that is included in an open task, when you return to the task, you might need to click to see the change.

- To open the event for editing, click .

  Alternatively, click the event name in the list.

- To delete the event, click .

  You can delete an event that is published. You cannot delete an event that is included in a task. When you delete an event, the event is removed from the events repository.

Change the Status

To change the status, open the event and navigate to the **Orchestration** tab. Depending on the status of the event, these are the options in the status list:

- **Mark Ready**: Changes the status from Designing to Ready. This option indicates that the event is ready to be published.
- **Return to Designing**: Changes the status from Ready back to Designing.
- **Publish**: Changes the status from Ready to Active. When you publish an item, you are prompted to publish any dependent items that are marked Ready.
- **Republish**: Changes the status from Out of Sync back to Ready. If the content of a published item is changed and saved, that item becomes out of sync with the published version. To synchronize the content, select **Republish**. Otherwise, the item stays out of sync with the published version and the updates are not delivered.

  For more information, see "Republishing Out of Sync Items" on page 138.
- **End**: Changes the status from Active to Completed. Completed events cannot be included in a task and cannot be modified. Only an event that is not currently in use by a task can be completed. Ending an event stops any associated data collection and makes the event's content unavailable. In addition, any unsaved changes to the event are lost.

View Usage Information

From the **Orchestration** ⇨ **Usage** tab, you can view which items use the event.

The ability to view dependencies between items enables you to see the items that a task depends on to work successfully. Usage information helps you identify how changes that you make to one item might affect another item.

Items That Use the Event

The first section shows the items that use the event. For example, if the event is used in a task, the task is included in the list.

The Priority column displays the priority of like tasks that use the event. Priority applies only to mobile spot, web spot, and mobile in-app message tasks because each of those task types might have two or more tasks that compete for the same resources. Other task types do not use prioritization.

For non-A/B test tasks, priority is on a scale of 1 through 5 (where 1 is the highest). The default is 3. An A/B test task has a priority of Test, which is higher than a non-A/B test task. An A/B test task always delivers its content.

You can change the priority of a non-A/B test task on the task's **Orchestration** ⇨ **Priority** tab.

To open an item, click the item. To view item details and to open the item, click ⓘ in the item's row.

Items That the Event Uses

The second section shows items that the event uses. Because an event does not use another item, the list is empty.

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Collecting Mobile Data with the Mobile SDK

About the Mobile SDK

The mobile SDK for SAS Customer Intelligence 360 is a supporting library that enables you to add support for event collection and managed content to your native mobile applications (apps). You can use collected events to understand how your mobile app is performing and easily target users for content distribution.

Here are some benefits that the mobile SDK provides:

- minimizes overhead on both the development and usage of your native mobile app.
- gathers data whether the app is online or offline. Offline data is sent back to SAS Customer Intelligence 360 after the device has connectivity. If the SDK is unable to reach the server at the time of an event, it stores the event locally and retries any time that another event occurs. Each retry pulls only 5 days of events from the local storage and deletes anything older than that.
- has built-in abilities to track geofences and beacons if your company needs to support these.
- along with SAS Customer Intelligence 360, enables developers and marketers to create their own custom events and to support several built-in system events.

For the latest changes to the mobile SDK, go to Mobile SDK Change Log for SAS Customer Intelligence 360.

You may need to enable users such as marketers, business analysts, and designers to create the items that SAS Customer Intelligence 360 uses to deliver content and collect and analyze data, such as defining page and session settings and uploading location data (preloaded geofence and beacon information). For more information, see “Data Sources” and Chapter 20, “Importing Data,”.

CAUTION! As of April 2017, the SASMobileMessagingDelegate has been deprecated. Please migrate your implementations to use SASMobileMessagingDelegate2 instead of SASMobileMessagingDelegate.

The SASMobileMessagingDelegate interface for receiving callbacks for user interactions with in-app messages and push notifications and the associated setter function in the SASCollector API have been deprecated with SASMobileMessagingDelegate2. SASMobileMessagingDelegate2 offers a new ‘action’ callback with an additional parameter providing the type of mobile message that was shown (in-app message or push notification).

In iOS, the signature is now:

```
[SASCollector setMobileMessagingDelegate2: (id<SASMobileMessagingDelegate2>)];
```

```
-(void) actionWithLink:(NSString *)link type:(SASMobileMessageType)type{}
```

with the type parameter being either SASMobileMessageTypeInAppMessage or SASMobileMessageTypePushNotification.

In Android, the signature is now:

```
public void action(String s, SASMobileMessageType type)
```

with the type parameter being either SASMobileMessageType .IN_APP_MESSAGE or SASMobileMessageType.PUSH_NOTIFICATION.

Creating a Mobile Application

Register a Mobile Application

If your organization uses mobile apps to interact with your customers, SAS Customer Intelligence 360 enables you to define, customize, and manage the messages and creatives that you send to your apps. These messages and creatives can be customized and targeted to a customer based on the type of mobile device the customer uses, how the customer interacts with your app, and where the customer is located.

To take advantage of this capability, you must create and register your organization's mobile app:

1. Click **General Settings** from the navigation bar and select **Content Delivery ⇨ Mobile Applications.**
2. Click .
3. Specify the application name and ID. The system uses the application ID to associate the application with the mobile events and spots that you create. The application ID must be unique.
4. Select whether you want the data collection status to be active or inactive. Selecting inactive stops the collection of data for the mobile app.
5. Enter the required credentials for Apple or Google notifications:
   - Click **Add** in the **Apple Production Certificate and Key** section. Enter the Apple Push Services production certificate and key, and then click **OK**.

     For more information, see “Apple Production and Development Certificates and Keys for Enabling Push Services” on page 386.

     For more information about setting up your iOS device, see the appropriate Apple Developer website.
   - Click **Add** in the **Apple Development Certificate and Key** section. Enter the Apple Push Services development certificate and key, and then click **OK**.

     For more information, see “Apple Production and Development Certificates and Keys for Enabling Push Services” on page 386.

For more information about setting up your iOS device, see the Apple Developer website.

- Click **Add** in the **Firebase Cloud Messaging Server Key** section. Enter the Firebase cloud messaging server key, and then click **OK**.

  For more information, see "Firebase Cloud Messaging Service Key" on page 391.

  For the most recent information about registering and setting up your mobile app on Android, see the Firebase Developers website.

6 Click **Done**.

After you have established a certificate and a key for your mobile app, you can replace or remove them by clicking the appropriate button.

Apple Production and Development Certificates and Keys for Enabling Push Services

To obtain the production or development certificate and key:

1 In the Keychain Access app on your Mac, generate a Certificate Signing Request (CSR):

  a Navigate to **Certificate Assistant** ⇨ **Request a Certificate from a Certificate Authority**.

  b Enter an email address and the application name as the common name.

  c Select **Save to Disk** to generate the *appname*.certSigningRequest.

  d Click **Continue** and save the file to a project folder.

2 On the Apple Developer website, sign in as a developer.

3 To create an application ID:

  a In the **iOS Apps** section, select **Identifiers** ⇨ **App IDs**, and then click +.

  b In the **App ID Description** section, enter a name. You might have to replace the automatically generated app ID.

  c In the **Explicit App ID** section, enter the bundle ID.

  d In the **App Services** section, select **Push Notifications**.

  e Click **Continue**, and then click **Submit**. The app is now registered to your account.

  f Click **Done**.

4 To create a development or a production certificate:

  a In the **iOS Apps** section, select **Certificates** ⇨ **All**, and then click +.

  b In the **Development** section or in the **Production** section, whichever is applicable, select **Apple Push Notification service SSL (Sandbox)**.

c Click **Continue**.

d Select the app ID from step 3, and then click **Continue**.

5 To upload the CSR file that you generated in step 1:

a Click **Choose File**, select a file, and then click **Choose**.

b Click **Generate**.

c Click **Download** to download the certificate to a project folder.

6 At a command prompt, convert the Certificate (.cer) file to a Personal Information (.pem) file to make it readable.

For a development certificate, enter this command:

```
openssl x509 -in aps_development.cer -inform der -out AppNameCert.pem
```

For a production certificate, enter this command:

```
openssl x509 -in aps.cer -inform der -out AppNameCertProd.pem
```

A certificate is placed in the .pem file.

7 To convert the private key (.p12) file to a .pem file and make it readable:

a In the Keychain Access app, select **login**, and then select the **Keys** category.

b Right-click the app name, and then click **Export**.

c Provide a password. The file is exported as appnameKey.p12.

d At a command prompt, enter this command to convert the .p12 file to a .pem file to make it readable:

```
openssl pkcs12 -in AppNameKey.p12 -out AppNameKey.pem -nodes -clcerts
```

A private key is placed in the .pem file.

8 To obtain the certificate and key that SAS Customer Intelligence 360 needs, open the .pem file.

- The certificate is the information in the section from -----`Begin RSA Certificate`----- to -----`End RSA Certificate`-----, including the begin and end section headings.
- The key is the information in the section from -----`Begin RSA Private Key`----- to -----`End RSA Private Key`-----, including the begin and end section headings.

Copy and paste the certificate information in the appropriate sections described in step 5 in “Register a Mobile Application”. Do the same for the key.

Now that you have registered the certificate and key, add code to enable push services in your application:

1 In your AppDelegate, add an attempt to register for Remote Notifications to these methods:

- applicationWillEnterForeground(_:)
- application:didFinishLaunchingWithOptions:

Use this code for Swift:

```
let center = UNUserNotificationCenter.current()
```

```
center.requestAuthorization(options: [.alert, .sound], completionHandler:
{
granted, error in DispatchQueue.main.async(execute: {
  UIApplication.shared.registerForRemoteNotifications()
 })
})
```

Use this code for Objective-C:

```
UNUserNotificationCenter *center =
  UNUserNotificationCenter.currentNotificationCenter;
[center requestAuthorizationWithOptions:UNAuthorizationOptionAlert|
 UNAuthorizationOptionSound completionHandler:^(BOOL granted, NSError *error) {
   dispatch_async(dispatch_get_main_queue(), ^{
     [[UIApplication sharedApplication] registerForRemoteNotifications];
   });
}];
```

Note: This code supersedes the use of registerUserNotificationSettings:settingsForTypes:.

2 The registration is an opt-in operation, so there is interaction with the user before the registration can proceed. You need to respond to the registration.

Use this code for Swift:

```
func application(_ application: UIApplication,
   didFailToRegisterForRemoteNotificationsWithError
error: Error) {print("Failed to get token, error: \(error)")}

func application(_ application: UIApplication,
   didRegisterForRemoteNotificationsWithDeviceToken
deviceToken: Data)
 {
  SASCollector.register(forMobileMessages: deviceToken, completionHandler: {
    print("Registration succeeded")
  }, failureHandler: {
    print("Registration failed")
  })
 }
```

Use this code for Objective-C:

```
- (void)application:(UIApplication*)application
   didFailToRegisterForRemoteNotificationsWithError:
(NSError*)error
{
    NSLog(@"Failed to get token, error: %@", error);
}

-(void)application:(UIApplication *)application
   didRegisterForRemoteNotificationsWithDeviceToken:(NSData *)deviceToken
{
  [SASCollector registerForMobileMessages:deviceToken
    completionHandler:^{NSLog(@"Registration succeeded");}
    failureHandler:^{NSLog(@"Registration failed");}
  ];
}
```

3 In the didRegisterForRemoteNotificationsWithDeviceToken method, you receive a device token. This token must be sent to the server for storage because the token is used when sending a push notification or in-app message.

Use this code for Swift:

```
 func application(_ application: UIApplication,
        didReceiveRemoteNotification userInfo:[AnyHashable : Any])
{
   SASCollector.handleMobileMessage(userInfo, with: application)
   if !SASCollector.handleMobileMessage(userInfo, with: application) {
      // handle the message here. It is not a message for SASCollector.
   }
 }
```

Use this code for Objective-C:

```
-(void)application:(UIApplication *)application
       didReceiveRemoteNotification:(NSDictionary *)userInfo {
   [SASCollector handleMobileMessage:userInfo WithApplication:application];
   if (![SASCollector handleMobileMessage:userInfo WithApplication:application])
   {
     // handle the message here. It is not a message for SASCollector.
   }
}
```

4 (Optional) To receive callbacks for in-app messages and push notifications, SASMobileMessagingDelegate2 offers an action callback with an additional parameter to provide the type of mobile message that was shown.

Here is the signature:

```
[SASCollector setMobileMessagingDelegate2: (id<SASMobileMessagingDelegate2>)];

-(void) actionWithLink:(NSString *)link type:(SASMobileMessageType)type{}
```

Note: The type parameter is either SASMobileMessageTypeInAppMessage or SASMobileMessageTypePushNotification.

To create a class that implements SASMobileMessagingDelegate, you can use the AppDelegate class and add the implementation as follows:

```
@interface AppDelegate : UIResponder
```

Then, in application:didFinishLaunchingWithOptions:, set the delegate on SASCollector as follows:

```
[SASCollector setMobileMessagingDelegate2:self];
```

Next, implement these methods:

```
/** Delegate object for handling user action from Mobile Message */
@protocol SASMobileMessagingDelegate

/** The Mobile message was dimissed without an explicit action.
    This could be a tap outside the message's UI area or via a close button
 */
-(void)messageDismissed {
    NSLog(@"Message dismissed");
}

/** The user selected an action associated with the mobile message
  @param link - specifies the data from SAS Customer Intelligence
  360 that defines the message associated with the user's action.
```

```
     @param type - specifies what type of mobile message the action was taken
       against. The type is an In-App Message or Push Notification.
    */
    -(void)actionWithLink:(NSString *)link {
      NSLog(@"received message with %@", link);
   }
```

When the user clicks one of the buttons in an in-app message or opens a push notification, often the next action is to navigate to a particular section of your app. Design your delegate to be as flexible as possible so that it can perform navigation based on the link provided by the creative. This flexibility enables the SAS Customer Intelligence 360 user to achieve the desired calls to action more easily.

Enable Rich Push Notifications for iOS Applications

When you create a mobile push notification creative in SAS Customer Intelligence 360, you can include a graphical asset for iOS applications. In order to render this rich push notification, the application must be able to download the asset and attach the asset to the notification message from the Apple Push Notification Service (APNS). These actions are accomplished through the implementation of a Notification Service Extension. If the application does not already include a Notification Service Extension, see UNNotificationServiceExtension at developer.apple.com.

When the Notification Service Extension is implemented, include code to capture the asset URL, download it, and make it available to the notification that is delivered to the user.

This is an example of code that captures the asset URL, downloads it, and makes it available to the notification. Modify the example to fit the needs of your app.

```
import os.log
import UserNotifications

class NotificationService: UNNotificationServiceExtension {

var contentHandler: ((UNNotificationContent) -> Void)?
var bestAttemptContent: UNMutableNotificationContent?

override func didReceive(_ request: UNNotificationRequest, withContentHandler
contentHandler: @escaping (UNNotificationContent) -> Void) {

self.contentHandler = contentHandler
bestAttemptContent = (request.content.mutableCopy() as? UNMutableNotificationContent)

// Get the custom data from the notification payload
if let notificationData = request.content.userInfo["data"] as? [String: String] {
if let urlString = notificationData["attachment-url"],
let fileUrl = URL(string: urlString) {

// Download the attachment
URLSession.shared.downloadTask(with: fileUrl) { (location, response, error) in
if let location = location {
```

```
let tmpDirectory = NSTemporaryDirectory()

// Move temporary file to add an appropriate extension
if let suggestedFilename = response?.suggestedFilename {
let tmpFile =
"file://".appending(tmpDirectory).appending(suggestedFilename).replacingOccurrences
(of: " ", with: "_")
let tmpUrl = URL(string: tmpFile)!

if FileManager.default.fileExists(atPath: tmpUrl.path) {
if FileManager.default.isDeletableFile(atPath: tmpUrl.path) {
try! FileManager.default.removeItem(atPath: tmpUrl.path)
}
}

try! FileManager.default.moveItem(at: location, to: tmpUrl)

// Add the attachment to the notification content
do {
let attachment = try UNNotificationAttachment.init(identifier: "ci360content",
url: tmpUrl) self.bestAttemptContent?.attachments = [attachment]
}
catch {
os_log("Error creating attachment: %{public}@", error.localizedDescription)
}
}
}
// Serve the notification content
self.contentHandler!(self.bestAttemptContent!)
}.resume()
}
}
}

override func serviceExtensionTimeWillExpire() {
// Called just before the extension will be terminated by the system.
// Use this as an opportunity to deliver your "best attempt" at modified content,
// otherwise the original push payload will be used.
if let contentHandler = contentHandler, let bestAttemptContent = bestAttemptContent {
contentHandler(bestAttemptContent)
}
}

}
```

Firebase Cloud Messaging Service Key

For the Android platform, in-app messages and push notifications are delivered to devices through the Firebase Cloud Messaging (FCM) service. To use this service, you must register your application with Firebase and provide your server key to SAS Customer Intelligence 360. The mobile SDK uses the FCM service to push data to Android clients. This service balances battery performance with timely message delivery.

To implement Firebase Cloud Messaging in your app:

1 Click FCM and follow the instructions to register your mobile app. An implementation of the FirebaseMessagingService interface, an implementation of FirebaseInstanceIdService, and a key from the Firebase Developer Console are created.

2 In your implementation of the FirebaseMessagingService interface, when the onMessageReceived callback is made, pass the data member of the RemoteMessage to SASCollector.handleMobileMessage. If the call returns false, the message was not intended for the SASCollector and the app should process the call as necessary.

```
if( ! SASCollector.getInstance().handleMobileMessage(remoteMessage.getData())) {
  //Handle non-SASCollector message
}
```

If you are initializing the SASCollector at a point other than the base application's `onCreate` path, the SASCollector should also be initialized in the onMessageReceived callback. Because the app might have been previously removed from memory, you must reassert any contingent logic to enable the SASCollector.

The mobile SDK API, SASCollector.handleMobileMessage(Bundle) has been deprecated in favor of SASCollector.handleMobileMessage(Map *String*, *String*). The content of RemoteMessage.getData() no longer needs to be copied to a Bundle object.

3 For the FirebaseInstanceIdService, be sure to pass the updated token to the SASCollector whenever the InstanceIDListenerService.onTokenRefresh callback is made.

```
String token = FirebaseInstanceId.getInstance().getToken();

if(token != null) {
  SASCollector.getInstance().registerForMobileMessages(token);
}
```

In most cases, this callback is made when Firebase has initialized within your app. If you find that the callback has not been made, you can manually request the token. The token is sent as a background thread. If the token that is given by Firebase is null, Firebase has not yet initialized properly.

If you are initializing the SASCollector at a point other than the base application’s `onCreate` path, provide the token to the SASCollector now.

```
new AsyncTask<Void, Void, Void>() {
  @Override
  protected Void doInBackground(Void... params) {
    String token = FirebaseInstanceId.getInstance().getToken();
    if(token != null) {
        SASCollector.getInstance().registerForMobileMessages(token);
    }
    return null;
  }
}.execute();
```

4 Copy the server key from the Firebase Developer Console. The server key is a string of about 175 characters.

In SAS Customer Intelligence 360, click **General Settings Content Delivery** ⇨ **Mobile Applications**. Select an application for which you want to add a server key. Click **Add** under **Firebase Cloud Messaging Server Key**. Paste the key in the **Server key** field.

After you have established a key for your mobile app, you can replace or remove the key.

5 Set the image resource to be used when displaying push notifications to the user.

```
SASCollector.getInstance().setMobileMessagingIcon
(R.drawable.my_notification_icon);
```

By default, the mobile SDK uses the app's main icon. The icon is flattened to a single color. Only the transparency is preserved when the icon is rendered for a push notification. This transparency often makes the app's main icon inappropriate for use in push notifications.

6 Android 8 requires that an application declare a channel when the application posts notifications. Create a notification channel by using the NotificationManager API in the initialization of your application. After the SDK is initialized, use this syntax to pass the channel ID to the NotificationManager API:

```
SASCollector.getInstance().setPushNotificationChannelId('channel_ID');
```

If a notification channel has not been specified, the SDK attempts to use NotificationChannel.DEFAULT_CHANNEL_ID. This channel might not be available to applications that target API level 26 and later.

7 (Optional) Set an implementation of SASMobileMessagingDelegate to receive callbacks regarding the actions taken by the user to the in-app messages and push notifications.

```
SASCollector.getInstance().setMobileMessagingDelegate2(
  new SASMobileMessagingDelegate2() {

  @Override
  public void dismissed()  {
    //The user has dismissed an in-app message
  }

  @Override
  public void action(String s, SASMobileMessageType type) {
    // The type parameter should be SASMobileMessageType.IN_APP_MESSAGE
    // or SASMobileMessageType.PUSH_NOTIFICATION.
    //
    // The user has clicked one of the actions in the in-app message or the push
    // notification. The String parameter is the link that is specified in the
    // definition of the creative in SAS Customer Intelligence 360.
  }
});
```

When the user clicks one of the buttons in an in-app message or opens a push notification, often the next best action is to navigate to a particular section of your app. Design your delegate to be as flexible as possible so that it can perform navigation based on the link provided by the creative. This flexibility enables the SAS Customer Intelligence 360 user to achieve the desired calls to action more easily.

Downloading the Mobile SDK

Download the SDK Framework for a Mobile Application

SAS Customer Intelligence 360 enables you to download an SDK framework that is preconfigured to work with a registered app. The properties files that you download include information such as the tag server URL, the application ID, and custom attributes. These properties files enable SAS Customer Intelligence 360 to communicate with your app and collect data about its usage and interactions with customers.

After you download the SDK framework for your registered app and integrate the SDK framework into your app code, you can start collecting data about app behavior such as the events and ads that are displayed in the app.

To download and activate the mobile SDK for SAS Customer Intelligence 360:

1 Open SAS Customer Intelligence 360.

2 Click **General Settings** from the navigation bar and select **Content Delivery** ⇨ **Mobile Applications**.

3 Click **Select** and select an application for which you want to download a SDK framework. The date the app was last modified is displayed.

4 Click . An SDK ZIP file (SASCollector-<applicationID>.zip) downloads to your workstation for the application that you selected. Unzip and save the file to a folder. The ZIP file includes SDK files for iOS and Android apps.

   For more information about iOS, see “Working with the iOS Mobile SDK”.

   For more information about Android, see “Working with the Android Mobile SDK”.

A list of the mobile apps is provided with the last modified date displayed.

To delete an app, select the app and click .

Working with the iOS Mobile SDK

Contents of the iOS Mobile SDK

The iOS Mobile SDK for SAS Customer Intelligence 360 is an iOS framework that is a directory of files in a particular structure. The directory includes headers, binaries, and resource files.

The iOS SDK and the Android SDK are distributed together as a single ZIP package. For more information about Android, see "Working with the Android Mobile SDK".

Here is a list of the supported operating system and software requirements for the iOS SDK:

- iOS 9+
- Xcode 8.1 or later

Install the iOS Mobile SDK

The iOS Mobile SDK is activated by adding the framework to the project settings. If you activate the iOS SDK and provide no additional code, then events are automatically collected when the app starts, opens, closes, or crashes. However, you can add custom events to identify specific parts of the app or events that happen within the app.

The SASCollector is the library that enables you to add support for event collection and publish content to your native iOS apps. You can use collected events to understand how your app is performing and target users for distribution of content.

To install the iOS Mobile SDK:

1. Navigate to the folder with the unzipped files that you created in "Downloading the Mobile SDK".
2. Open the iOS folder and double-click the SASCollector.zip file to create a directory named SASCollector. There are two files within the folder: SASCollector.framework and SASCollectorBundle.bundle.
3. In Finder, create a folder within your project folder named `framework`.
4. Copy the SASCollector.framework and SASCollectorBundle.bundle directories to the framework folder.
5. In Xcode, on the **Build Phases** tab, click **Link Binary with Libraries**.
6. Click **+** and click **Add Other**.

7 Select the SASCollector.framework file that you copied into your project folder and click **Open**.

8 On the **Build Phases** tab of the application target, click **Copy Bundle Resources**.

9 Click **+** and click **Add Other**.

10 Select the SASCollectorBundle.bundle file that you copied into your project folder and click **Open**.

11 Select the **Copy items if needed** check box and click **Finish**.

12 In Finder, drag the SASCollector.plist file from the iOS directory to your project folder in the Xcode navigator panel.

Note: Ensure that you add the file to the application target. This file contains all the information that is required for the iOS SDK framework to communicate to SAS Customer Intelligence 360.

Note: You can test the app by running it and then checking the log for the following message:

```
INFO: SendEvent startup at later time Status code: 200:no error
```

Enable Location-Based Features

Location services require user authorization. If location services are available, the iOS SDK is configured to prompt your app users to authorize location services as needed. The iOS SDK calls the requestAlwaysAuthorization method when the current authorization status is kCKAuthorizationStatusNotDetermined. This method is used when location services are set to be gathered regardless of whether the app is in the foreground or background. The prompt to the user includes text from the NSLocationAlwaysUsageDescription key that is in your app's Info.plist file. This key is required for the requestAlwaysAuthorization method.

Note: The location of a device is stored only for that session. Location data is not retained between sessions.

The info.plist file has a key value that grants permissions for location. The parameter UIRequiredDeviceCapabilities can have two possible values: **`location-services`** and **`gps`**. If your app needs one of these location services, set the appropriate value to **`True`**.

To include location services, complete these steps to link CoreLocation.framework inside your app:

1 Select your application in Xcode.

2 On the **Build Phases** tab, under **Link Binary with Libraries**, click **+**.

3 Select CoreFramework to add **CoreLocation.framework** to your project.

You can tell the SDK to begin monitoring location events. This is valid only if locationMonitoringDisabled is set.

```
/ +(void)startMonitoringLocation;
```

To disable location services out of the box, add the following to SASCollector.plist:

```
locationMonitoringDisabled Boolean YES
```

Here is an example SASCollector.plist:

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE plist PUBLIC "-//Apple//DTD PLIST 1.0//EN" "http://www.apple.com/DTDs/
PropertyList-1.0.dtd">
<plist version="1.0">
<dict>
    <key>locationMonitoringDisabled</key>
    <true/>
</dict>
</plist>
```

Add an Inline Ad

This step is optional. To place an advertisement in the ViewController:

1 In your storyboard, create a UIView that is the size of the ad spot that you want to display.

2 In the header file for the ViewController that contains the ad, import SASCollector.h:

```
#import <SASCollector/SASCollector.h>
```

3 Make the ViewController implement the SASIA_AdDelegate protocol:

```
#import <UIKit/UIKit.h>
#import "ClassWithProtocol.h"
@interface HomeViewController : UIViewController <SASIA_AdDelegate>
```

4 In Xcode, create a *filename*+Designable.m file. Make sure that the file is in a target for your project. Add this code to the file:

```
#import <SASCollector/SASCollector.h>

IB_DESIGNABLE
@interface SASCollectorUIAdView(Designable)

@end

IB_DESIGNABLE
@interface SASCollectorInterstitialAd(Designable)

@end
```

Close and reopen Xcode.

5 In InterfaceBuilder, change the class of the view to SASCollectorUIAdView.

6 Connect the delegate outlet of the ad to the hostViewController.

Note: The hostViewController must conform to the SASIA_AdDelegate protocol.

7 Connect the hostViewController outlet to the containing ViewController. This connection enables modal views to be presented over this ViewController.

8 To show ad content, you must specify a spotID. You can specify a spotID in either InterfaceBuilder or viewWillDisplay.

Because the load is an asynchronous call, the content might not appear immediately.

```
self.myAd1.spotID = @"MySpotID";
[self.myAd1 load];
```

If the spot that you created in SAS Customer Intelligence 360 expects attributes, create a dictionary of name-value pairs in Xcode. Pass the dictionary to the ad before you send the load message.

```
NSMutableDictionary* attributes = [NSMutableDictionary dictionary];
[attributes setObject:@"MyValue" forKey:@"MyName"];
[self.myAd1 setSpotAttributes:attributes];
```

Use the Ad Delegate

The Ad Delegate provides the means to alert you when certain actions occur (for example, when an ad loads, fails, closes, expands, resizes, begins, or ends an action).

To use the delegate object, run this code:

```
- (void) didLoad:(SASIA_AbstractAd *)_ad {
  if ([_ad isInterstitial])
  {
    [(SASCollectorInterstitialAd*)_ad showFromController:self];
    self.interstitialAd = nil; // ...demonstrates ad is ok
                               // after giving up strong reference
    return;
  }
}
```

Add an Interstitial Ad

This step is optional. For interstitial ads, the app calls the SASIA_InterstitialAd's showFromController method. By default, when a user touches an ad, its "click" action triggers a full-screen in-app interstitial view of the action's web page. A SASIA_AdDelegate can be notified when an in-app interstitial ad action has been dismissed by the user. To create an interstitial ad in the ViewController:

1 Run this code:

   ```
   self.interstitialAd = [[SASCollectorInterstitialAd alloc] init];
   ```

2 Make the ViewController implement the SASIA_AdDelegate protocol:

   ```
   self.interstitialAd.spotID = @"WordsFromGregInterstitial";
   self.MyInterstitialAd1.delegate = self;
   self.MyInterstitialAd1 load];
   ```

3 In Xcode, create a *filename*+Designable.m file. Make sure that the file is in a target for your project. Add this code to the file:

   ```
   #import <SASCollector/SASCollector.h>
   ```

```
IB_DESIGNABLE
@interface SASCollectorUIAdView(Designable)

@end

IB_DESIGNABLE
@interface SASCollectorInterstitialAd(Designable)

@end
```

Close and reopen Xcode.

Trigger System Events

The SAS Customer Intelligence 360 system is pre-configured to accept some events commonly seen in mobile apps that can be used by back-end reporting and targeting. The SASCollector class provides some helpful APIs for triggering these events (for example, Identity and New Page). The default variables are listed in SASCollectorEvents.h.

Identity

Call the identityWithType API when the user has signed in to your app and you are able to identify the user as a distinct user. Specify the type of identity (email, customer ID, login) in the type parameter and the value of the identifier in the value parameter. The types allowed are SASCOLLECTOR_IDENTITY_TYPE_CUSTOMER_ID, and SASCOLLECTOR_IDENTITY_TYPE_LOGIN. Other types need to be specified in the settings for SAS Customer Intelligence 360.

```
[SASCollector identity:@"user@mail.com" withType:SASCOLLECTOR_IDENTITY_TYPE_LOGIN];
```

Ensure that the identity values and types that you use for mobile are the same as the identity types defined in your web identity events. Customer ID corresponds to customer_ID, and Login corresponds to login_ID. For more information, see "User Identities".

New Page

Call the newPage API when the user is in a distinct section of the app. You should use a valid URI such as 'main' or 'main/popupmenu_edit_options' that identifies that portion of the app.

```
[SASCollector newPage:@"outdoor/fishing/livebait"];
```

The best practice is to place the event in the `viewDidAppear` method.

Note: The URI must be valid and cannot contain any spaces.

Return SDK Version

To return the SDK version, use the following code:

```
+(NSString*)sdkVersion;
```

Send Custom Events

Custom events enable you to better define the user behavior or action that you want to capture. Events can be used to trigger a task, set a goal, or define a segment. After you define an event, you can add attributes to it so that you can collect information about the context of the event. The system uses a unique event ID to identify the event.

To log a custom event (such as clicking a button) to the mobile SDK, call this event:

```
+(void)addAppEvent:(NSString*)eventName data:(NSDictionary *)data;
```

When you call this event, use these parameters:

- a string identifier for the event. This string identifier should be the Event ID specified in SAS Customer Intelligence 360.
- a map of name-to-value pairs of associated metadata to be sent with the event. This map can be null if you do not want to send any metadata (data = nil):

```
[SASCollector addAppEvent:@"myEvent"
                                    data:@{@"myAttributeName":@"myAttributeValue"}];
```

To create a custom event to represent the user performing a search within your app, including a record of how many results the search returned:

1. In SAS Customer Intelligence 360, click **Events**.
2. Click and select **Mobile**.
3. Specify one or more apps where the event occurs, and then enter a unique event ID. For example, if your event name is *Search*, you might use the event ID *Search*.
4. Navigate to **Event** ⇨ **Event Attributes**. Click to add a custom attribute. For example, create an Attribute named NumberOfResults to represent the number of results returned by the search.
5. Make your event available to other items by clicking **Orchestration** and selecting either **Mark Ready** or **Mark Ready and Publish**.

   Next, provide the event name, attribute name, and attribute value to your developer.

Reset the Mobile Device ID

You can reset the mobile SDK's unique identifier for the user by adding the following code somewhere in your app (for example, in About or Settings):

```
[SASCollector resetDeviceID];
```

Note: The device ID is a unique ID that is generated by the SASCollector.

Before you reset the mobile device ID, the push token should be invalidated for the previous device ID. To invalidate the push token, call the registerForMobileMessages API and provide a nonzero length string (such as spaces or `"delete"`) as the new token. After calling the resetDeviceID API, a new token should be retrieved from Apple Push Notification Service (APNS) and registered via registerForMobileMessages. When using a late initialization, SASCollector.initialize must be given the current Activity as the active Context, instead of the Application object.

Force Logoff for a User

Call the detachIdentity method if you enable users to sign out from your app. This method detaches the device from the customer's identity, so push notifications are no longer sent to this device. Use this code:

```
+(void)detachIdentity:(void(^)(bool))completionHandler
```

The completeHandler receives YES as a parameter if the call is successful.

Note: Use the identity method to reattach the device to the customer's identity.

Receive Broadcast Notifications

The mobile SDK emits an application-wide notification when certain events occur throughout the life cycle of the user's session. Your app must register to receive these notifications by using APIs native to the platform if you want to receive them. On iOS, you can create a function to handle the notifications:

```
-(void)eventFired:(NSNotification *)info
{
    NSString *event = [info.userInfo objectForKey:SASNOTIFICATION_USERINFO_EVENT];

    //Your logic to respond to the broadcast here
}
```

After you create the function, register the function with the default NotificationCenter:

```
[[NSNotificationCenter defaultCenter] addObserver:self
selector:@selector(eventFired:) name:SASNOTIFICATION_EVENT_DELIVERED object:nil];
```

The following events trigger a notification with the noted name and user information:

- An event is successfully delivered to the CI 360 back-end server – SASNOTIFICATION_EVENT_DELIVERED
  - NSString SASNOTIFICATION_USERINFO_EVENT
- A region fence is entered – SASNOTIFICATION_REGIONS_ENTER
  - NSString SASNOTIFICATION_USERINFO_REGION_IDENTIFIER
- A region fence is exited – SASNOTIFICATION_REGIONS_EXIT
  - NSString SASNOTIFICATION_USERINFO_REGION_IDENTIFIER
- A beacon is detected – SASNOTIFICATION_BEACON_ENTER

- NSUUID SASNOTIFICATION_USERINFO_BEACON_UUID
- NSNumber SASNOTIFICATION_USERINFO_BEACON_MAJOR
- NSNumber SASNOTIFICATION_USERINFO_BEACON_MINOR

SDK Internal Logging

A log of app information, system performance, and user activities is available. This information can be useful for resolving problems during development and testing. Set the log to **Error** when shipping your app. The levels are Off, Error (default), Warning, Info, Debug, Verbose, and All.

```
[SASLogger setLevel:SASLoggerLevelError];
```

Determine the Mobile App Version

You can determine the version of your mobile app from the mobile SDK. You can pass your mobile app version to the mobile SDK by performing these actions:

- adding applicationVersion plus its value to the .plist file
- setting the Build number in **Targets** ⇨ **General** ⇨ **Build**.
- setting the version via code in the project:

  ```
  [SASCollector setApplicationVersion: (NSString)];
  ```

You can also get the version by including the string:

```
[SASCollector applicationVersion];
```

Disable the Mobile SDK

You can include code commands that turn the mobile SDK on or off. For example, if a mobile app user goes to the app's Settings area on their device and turns off SAS tracking, the mobile app should turn off the SAS SDK. This prevents any more data collection or publishing. Typically, this capability is provided to support privacy requirements and enable more complicated mobile apps to turn on tracking when certain use cases are applied.

To turn off the mobile SDK, use this command:

```
[SASCollector shutdown];
```

To turn on the mobile SDK:

1. In the SASCollector.plist file, set `developerInitialized` to `Yes`.
2. Use this command:

   ```
   [SASCollector initializeCollection];
   ```

If the SDK is initialized after your Activity's onStart method has been called, the context passed to initialize( ) should be the current Activity. Otherwise, the context should be your app's instance of the Application object.

Example: How to Build an iOS Mobile App That Connects to SAS Customer Intelligence 360

This SAS Communities article shows you how to build a mobile app that uses SAS Customer Intelligence 360.

Working with the Android Mobile SDK

Contents of the Android Mobile SDK

The Android Mobile SDK for SAS Customer Intelligence 360 is an Android library.

The Android SDK and the iOS SDK are distributed together as a single ZIP package. For more information about iOS, see "Working with the iOS Mobile SDK".

Here is a list of the supported operating system and software requirements for the Android SDK:

- Android 5.0+

  Note: Beginning with release 19.03 of SAS Customer Intelligence 360, Android 4.4 is no longer supported.

- Android Studio 3.*x*
- Android Support Library v4, version 28.*x*
- (Optional) Google Play Services, 16.*x*
  - GCM APIs for Mobile Messages
  - Location APIs for Geofencing
- The JSON processing library, Gson, version 2.8.*x*
- Gradle Build Tools Version 28.*x*
- Gradle Compile SDK Version 28
- Gradle minSDKVersion 21

Activate the Android Mobile SDK

The Android Mobile SDK is the library that enables you to add support for event collection and publish content to your native Android apps. You can use collected events to understand how your app is performing and target users for distribution of content.

To activate the Android Mobile SDK:

1 Navigate to the folder with the ZIP files that you created in “Downloading the Mobile SDK”.

2 Include a dependency to the SASCollector.jar in your project by adding the SASCollector.jar to your **app/libs** folder.

3 Add the SASCollector.properties file to your **app/src/main/assets** folder.

   Note: If the **app/src/main/assets** folder does not exist, create it.

4 Include the dependent libraries in the project. The dependent libraries should be included in the dependencies definition of your app's Gradle build file.

```
compile 'com.android.support:support-v4:23.1.1'
compile 'com.google.android.gms:play-services-location:8.1.0'
compile 'com.google.code.gson:gson:2.2.4'
```

5 Add the SASCollectorIntentService definition to your app's manifest.

6 Include the android.permission.INTERNET permission in your manifest:

```
<manifest xmlns:android="http://schemas.android.com/apk/res/android"...>
  <uses-permission android:name="android.permission.INTERNET" />
  <application>
    <service android:name="com.sas.mkt.mobile.sdk.SASCollectorIntentService">
    </service>
  </application>
</manifest>
```

Mobile Event Collection

You can enable event collection for Android apps in one of these three ways:

- Specify com.sas.mkt.mobile.sdk.MonitoredApplication as the name attribute of the app that is defined in your AndroidManifest.xml. The android:name component (highlighted) is crucial.

```
<application
  android:allowBackup="true"
  android:hardwareAccelerated="true"
  android:label="@string/app_label"
  android:icon="@drawable/main_app_ico"
  android:theme="@android:style/Theme.Holo.Light"
  android:name="com.sas.mkt.mobile.sdk.MonitoredApplication">
  <activity...</activity>
</application>
```

- If a custom Application class is already defined, update it to extend com.sas.mkt.mobile.sdk.MonitoredApplication (highlighted).

  If you override this method, call super.onCreate (highlighted).

```
package com.acme.apps
import com.sas.mkt.mobile.sdk.MonitoredApplication;
```

```
public class MyApp extends MonitoredApplication {
  ...
  @Override
  public void onCreate() {
    //Make any calls you need to perform BEFORE the SASCollector is active
    ...
    super.onCreate();
  }
}
```

Note: If your application uses a multidex configuration, use MonitoredMultiDexApplication as the parent class instead.

- If you are already using a third-party Application class and it is by direct reference, extend this class to create a custom app of your own. If you are already extending another third-party Application class, add these calls (highlighted) to your app class:

```
package com.acme.apps

public class MyApp extends MyExistingParentApplication
{
...
  @Override
  public void onCreate() {
    // Make any calls you need to perform BEFORE the SASCollector is active.
    ...
   SASCollector.getInstance().initialize(this);
  }

  @Override
  public void onConfigurationChanged(Configuration newConfiguration) {
    //Notify the SASCollector as soon as possible in this case
    SASCollector.getInstance().onConfigurationChanged(newConfiguration);
    //Any additional logic for the configuration change should follow
    ...
  }
 }
```

Note: If you are initializing the SASCollector after your application has already started an Activity (for example, Activity.onStart()), you should pass the current Activity to SASCollector.initialize rather than to the base Application object. This action enables the SASCollector to establish the current state of the app for tracking.

Enable Location-Based Features

(Optional) To enable location-based features:

1 If your application uses the geofencing and beacon capabilities of SAS Customer Intelligence 360, link your project to Google Play Services. This setup can vary depending on your development environment. For more information, see https://developer.android.com/google/play-services/setup.html.

2 Add the android.permission.ACCESS_FINE_LOCATION permission as shown in this example:

```
<manifest xmlns:android="http://schemas.android.com/apk/res/android" ...>
<uses-permission android:name="android.permission.ACCESS_FINE_LOCATION" />
   <application>
  ...
  </application>
</manifest>
```

In Android 6 and later, the SDK prompts the user to approve location permissions at run time.

To disable the prompt, set this SASCollector.properties configuration property:

```
location.permission.prompt.enable=false
```

After you have obtained the permission from the user within your own application logic, use this code to notify the SDK to begin monitoring location events with the API:

```
SASCollector.getInstance().startMonitoringLocation();
```

3 Adding the manifest entries causes the SDK to automatically send location data at appropriate times in the app's life cycle. To disable the automatic start-up of location monitoring, add the following setting to the SASCollector.properties file:

```
location.monitoring.disabled=true
```

The default is `false` if the value is not specified. When you are ready for the SDK to begin monitoring location, call the API:

```
SASCollector.getInstance().startMonitoringLocation()
```

Note: The location of a device is stored only for that session. Location data is not retained between sessions.

Add an Inline Ad

Use the UI component com.sas.mkt.mobile.sdk.ads.SASCollectorAd in your layout XML or programmatically in your Activity or Fragment class.

```
<com.sas.mkt.mobile.sdk.ads.SASCollectorAd
            android:id="@+id/myAd"
            android:layout_width="fill_parent"
            android:layout_height="wrap_content" />
```

When you are ready to display the ad content, load the desired Spot ID into the ad. The load occurs asynchronously, so this method returns immediately.

```
SASCollectorAd myAd = (SASCollectorAd)findViewById(R.id.myAd);
myAd.load("MySpotID", tags);
```

Note: In this example, **`tags`** is a map of name-value pairs to support the ad request. If there are no additional tags to be used, the map for name-value pairs can be null:

```
Map <String, String> tags = new HashMap <String, String> ();
tags.put("WordsGeoFence", "building_r");
```

The Spot ID is defined in the SAS Customer Intelligence 360 user interface.

To receive notifications about asynchronous loads, failures to load, and user interactions of the ad, assign an implementation of the com.sas.ia.android.sdk.AdDelegate class to the ad:

```
myAd.setDelegate(myDelegate);
```

Use the Ad Delegate

The Ad Delegate provides the means to alert you when certain actions occur (for example, when an ad loads, fails, closes, expands, resizes, begins, or ends an action). To receive notifications about asynchronous loads, failures to load, and user interactions of the ad, assign an implementation of the com.sas.ia.android.sdk.AdDelegate class to the ad.

To use the delegate object:

```
myAd.setDelegate(myDelegate);
```

Clicking a link in ad content executes the callback AdDelegate.willBeginAction. If this callback returns a true result, then the SDK attempts to open the link target as an external web page. By default, the content is opened in an embedded web browser within the app. In order for this action to operate, the activity must be registered in the app's manifest as shown in this example:

```
<activity android:name="com.sas.ia.android.sdk.InterstitialWebActivity">
    </activity>
```

If this activity is not registered in the app's manifest, then the SDK opens the external web page in the device's stand-alone web browser. If you want to force the ad to open the external web page in the device's stand-alone browser, set the ad's actionInBrowser property to true as shown in this example:

```
mySASCollectorAd.setActionInBrowser(true);
```

Add an Interstitial Ad

For interstitial ads, the app calls the InterstitialAd's show method. By default, when a user touches an ad, its "click" action triggers a full-screen in-app interstitial view of the action's web page. An AdDelegate can be notified when an in-app interstitial ad action has been dismissed by the user. To create an interstitial ad, programmatically create an instance of the com.sas.mkt.mobile.sdk.ads.SASCollectorInterstitialAd class.

```
SASCollectorInterstitialAd myAd = new SASCollectorInterstitialAd(myActivity);
```

Load the ad with your Spot ID and supplemental attributes, the same way you would load for an inline ad.

```
myAd.load("MySpotID", tags);
```

Though the class is a UI view itself, it should not be added to your app's layout. Instead, use the show() method of the class to present the ad to the user when you are ready for the ad to take control of the screen. Use the Ad's delegate onLoad() method as a trigger to know when the ad content is ready to be shown.

```
myAd.show();
```

Return SDK Version

The following string returns the SDK version:

```
com.sas.mkt.mobile.sdk.BuildInfo.VERSION
```

Trigger System Events

The SAS Customer Intelligence 360 system is pre-configured to accept some events commonly seen in mobile apps that can be used by back-end reporting and targeting. The SASCollector class provides some helpful APIs for triggering these events (for example, Identity, and New Page).

Identity

Call the identityWithType API when the user has signed in to your app and you are able to identify the user as a distinct user. Specify the type of identity (customer ID or login ID) in the type parameter and the value of the identifier in the value parameter. The types allowed are SASCollector.IDENTITY_TYPE_CUSTOMER_ID and SASCollector.IDENTITY_TYPE_LOGIN. Other types need to be specified in the settings for SAS Customer Intelligence 360.

For example:

```
SASCollector.getInstance().identityWithType(SASCollector.IDENTITY_TYPE_LOGIN,
   "user@mail.com");
```

Ensure that the identity values and types that you use for mobile are the same as the identity types defined in your web identity events. Customer ID corresponds to customer_ID, and Login corresponds to login_ID. For more information, see "User Identities".

New Page

Call the newPage API when the user is in a distinct section of the app. You should use a valid URI such as 'main' or 'main/popupmenu_edit_options' that identifies that portion of the app.

```
SASCollector.getInstance().newPage("outdoor/fishing/livebait");
```

The best practice is to make the call in the `onResume` method of your Activity or Fragment.

Note: The URI must be valid and cannot contain any spaces.

Send Custom Events

Custom events enable you to better define the user behavior or action that you want to capture. Events can be used to trigger a task, set a goal, or define a segment. Once you define an event, you can add attributes to it so that you can collect information about the context of the event. The system uses a unique event ID to identify the event.

To log a custom event (such as clicking a button) to the mobile SDK, call

```
SASCollector.getInstance().addAppEvent(eventId, attrs)
```

with these parameters:

- a string identifier for the event. This string identifier should be the Event ID specified in SAS Customer Intelligence 360.
- a map of name-to-value pairs of associated metadata to be sent with the event. This map can be null if you do not want to send any metadata (attrs = null):

  ```
  Map<String, String> attrs = new HashMap<String, String>();
     attrs.put("myAttributeName", "myAttributeValue");
  SASCollector.getInstance().addAppEvent("myEvent", attrs)
  ```

To create a custom event to represent the user performing a search within your app, including a record of how many results the search returned:

1. In SAS Customer Intelligence 360, click **Events**.
2. Click and select **Mobile**.
3. Specify one or more apps where the event occurs and enter a unique event ID. For example, if your event name is *Search*, you might use the event ID *Search*.
4. Navigate to **Event** ⇨ **Event Attributes**. Click + to add a custom attribute. For example, create an Attribute named NumberOfResults to represent the number of results returned by the search.
5. Make your event available to other items by clicking **Orchestration** and selecting either **Mark Ready** or **Mark Ready and Publish**.

   Next, provide the event name, attribute name, and attribute value to your developer.

Reset the Mobile Device ID

You can reset the mobile SDK's unique identifier for the user by adding this code somewhere in your app (for example, in About or Settings):

```
SASCollector.getInstance().resetDeviceID();
```

Note: The device ID is a unique ID that is generated by the SASCollector and stored locally on the device. Uninstalling the app or clearing the app's local data resets the device ID.

Before you reset the mobile device ID, the push token should be invalidated for the previous device ID. To invalidate the push token, call the registerForMobileMessages API and provide a nonzero length string (such as spaces or `"delete")` as the new token. After calling the resetDeviceID API, a new token should be retrieved from Firebase Cloud Messaging (FCM) and registered via registerForMobileMessages. When using a late initialization, SASCollector.initialize must be given the current Activity as the active Context, instead of the Application object.

Force Logoff for a User

Call the detachIdentity method if you enable users to sign out from your app. This method detaches the device from the customer's identity, so push notifications are no longer sent to this device. Use this code:

```
void detachIdentity()
```

The mobile SDK emits a broadcast for success or failure.

Use the identity method to reattach the device to the customer's identity.

CAUTION! Make sure the app is not in the background on Android 8+ On Android 8 and later releases, do not call the detachIdentity method if the app is in the background.

Receive Broadcast Notifications

The mobile SDK emits an application-wide notification when certain events occur throughout the life cycle of the user's session. Your app must register to receive these notifications by using APIs native to the platform. On Android, you can implement an android.content.BroadcastReceiver:

```
private List<Intent> broadcasts = new ArrayList<Intent>();
BroadcastReceiver receiver = new BroadcastReceiver() {
   @Override
   public void onReceive(Context context, Intent intent) {
          String eventType =
         intent.getStringExtra(SASCollector.BROADCAST_EXTRA_EVENT_TYPE);
      //Your logic to respond to the broadcast here
   }
};
```

After you implement the receiver, register the receiver with the LocalBroadcastManager:

```
LocalBroadcastManager lbm =
LocalBroadcastManager.getInstance(myContext);
lbm.registerReceiver(receiver,
   new IntentFilter(SASCollector.BROADCAST_EVENT_DELIVERED));
```

Note: In order to not miss any event broadcasting, register the receiver at your project's Application level.

These events trigger a notification with the noted extras:

- An event is successfully delivered to the CI 360 back-end server – SASCollector.BROADCAST_EVENT_DELIVERED
  - String SASCollector.BROADCAST_EXTRA_EVENT_TYPE
- A region fence is entered–SASCollector.BROADCAST_REGION_ENTERED
  - String SASCollector.BROADCAST_EXTRA_REGION_IDENTIFIER
- A region fence is exited–SASCollector.BROADCAST_REGION_EXITED

   - String SASCollector.BROADCAST_EXTRA_REGION_IDENTIFIER
- A beacon is detected–SASCollector.BROADCAST_BEACON_ENTERED
   - String SASCollector.BROADCAST_EXTRA_BEACON_UUID
   - short SASCollector.BROADCAST_EXTRA_BEACON_MAJOR
   - short SASCollector.BROADCAST_EXTRA_BEACON_MINOR

SDK Internal Logging

A log of app information, system performance, and user activities is available. This information can be useful for resolving problems during development and testing. Set the log to **Error** when shipping your app. The levels are Off, Error (default), Warning, Info, Debug, Verbose, and All.

```
SLog.setLevel(SLog.Error);
```

Mobile Device Restart Detection

Mobile SDK services do not start until the app opens for the first time. In order for the SDK services to restart after subsequent reboots of a device, the SDK requires an additional permission and a listener registered as shown in this example:

```
<manifest xmlns:android="http://schemas.android.com/apk/res/android" ...>
  <uses-permission android:name="android.permission.RECEIVE_BOOT_COMPLETED"/>
  <application>
    <receiver android:name="com.sas.mkt.mobile.sdk.SASCollectorBroadcastReceiver">
      <intent-filter>
        <action android:name="android.intent.action.BOOT_COMPLETED"/>
      </intent-filter>
    </receiver>
  </application>
</manifest>
```

ProGuard Exception

If you are using ProGuard in your application, you might experience difficulties receiving messages. ProGuard obfuscates CI360 event model classes, which can cause messages to be incoherent to the server. If you are using ProGuard, include the following exception in the ProGuard configuration for CI360 model classes:

```
-keepnames class com.sas.mkt.mobile.sdk.domain.** {*; }
```

Determine the Mobile App Version

You can determine the version of your mobile app from the mobile SDK. You can pass your mobile app version to the mobile SDK by performing one of these actions:

- adding applicationVersion plus its value to the properties file
- setting android:versionCode in the AndroidManifest.xml file
- setting the version via code in the project

  ```
  SASCollector.getInstance().setApplicationVersion(String);
  ```

You can also get the version by including the string:

```
SASCollector.getInstance().getApplicationVersion()
```

Disable the Mobile SDK

You can include code commands that turn the mobile SDK on or off. For example, if a mobile app user goes to the app's Settings area on his device and decides to turn off SAS tracking, the mobile app should turn off the SAS SDK, thereby preventing any more data collection or publishing. Typically, this capability is provided to support privacy requirements and enable more complicated mobile apps to turn on tracking when certain use cases are applied.

- Run this code to turn off the mobile SDK:

  ```
  SASCollector.getInstance().shutdown();
  ```

- Run this code to start the mobile SDK again:

  ```
  SASCollector.getInstance().initialize(Context context);
  ```

If the SDK is being initialized after your Activity’s onStart method has been called, the context passed to initialize( ) should be the current Activity. Otherwise, the context should be your app’s instance of the Application object.

Example: How to Build an Android Mobile App That Connects to SAS Customer Intelligence 360

This SAS Communities article shows you how to build a mobile app that uses SAS Customer Intelligence 360.

32
Working with External Events

About External Events

You can use an access point to inject events from external applications into SAS Customer Intelligence 360. When you inject the events, you can specify custom attributes.

Creating External Events

Create an External Event

To specify the name of an event to be injected through an access point from an external application:

1 Click Events.

2 Click .

3 Click External.

4 Select the applications where the event will occur. For more information, see “External Applications” on page 75.

5 Click Create Event.

6 On the Event Details ⇨ Action Details tab, view the applications where the event occurs and enter a unique event ID. Click to modify the selection of applications.

Note: The Event ID does not need to match the configuration for the access point.

7 On the **Event Details** ⇨ **Event Attributes** tab, specify custom event attributes by clicking ✚.

Note: After an event is published, you can add new attributes but you cannot modify existing attributes.

Adding attributes enables you to collect additional information about the action that triggers the event and the page that contains the event. The attribute data that is collected can be used elsewhere. For example, attributes that you add to this event can be selected as criteria when you define a segment. The available attributes vary by event type.

8 (Optional) Select **Personally identifiable information** if the associated data is considered personal information. For some attribute types, this option is not available.

When this option is enabled, the system stores the data in a temporary table. The data is then discarded after it is used by associated tasks.

9 Click 🖫.

10 Enter information in the **Name** field and click **Save**.

Note: The event name must match the configuration for an access point and in the actual event that is sent to the access point.

11 On the **Orchestration** tab, complete one of these actions:

- Select **Mark Ready** to change the status from Designing to Ready. A Ready status indicates that this item is ready to be published. When you are ready to promote an item from a Ready status to an Active status, click **Publish**.

  Note: When you publish an item, you are prompted to publish any dependent items that are marked Ready.

  Items with a Ready status can be changed back to a Designing status by clicking **Return to Designing**. Changing this status to Designing prevents the item from being published.

  Note: If your item has a Ready status and a start date, the item is not automatically published when the start date is reached. For example, if you are creating a task, it must be published in order for the start date to activate the task.

- Select **Mark Ready and Publish** to change the status from Designing to Active. Items with an Active status cannot be changed back to Designing.

If the content of a published item is changed and saved, that item becomes out of sync with the published version. To synchronize the content, select **Republish**. Otherwise, the item stays out of sync with the published version and the updates are not delivered.

For more information, see "Republishing Out of Sync Items" on page 138.

12 From the **Orchestration** ⇨ **External Availability** tab, select the access points that you want to send the event to.

You can click ⓘ to view more information about the access points.

13 (Optional) Click ⋮ and select **Properties** to add a name and a description.

Manage External Events

From the **Orchestration** ⇨ **Usage** tab, you can view which items use the event.

The ability to view dependencies between items enables you to see the items that a task depends on to work successfully. Usage information helps you identify how changes that you make to one item might affect another item.

Items That Use the Event

The first section shows the items that use the event. For example, if the event is used in a task, the task is included in the list.

The Priority column displays the priority of like tasks that use the event. Priority applies only to mobile spot, web spot, and mobile in-app message tasks because each of those task types might have two or more tasks that compete for the same resources. Other task types do not use prioritization.

For non-A/B test tasks, priority is on a scale of 1 through 5 (where 1 is the highest). The default is 3. An A/B test task has a priority of Test, which is higher than a non-A/B test task. An A/B test task always delivers its content.

You can change the priority of a non-A/B test task on the task's **Orchestration** ⇨ **Priority** tab.

To open an item, click the item. To view item details and to open the item, click ⓘ in the item's row.

Items That the Event Uses

The second section shows items that the event uses. Because an event does not use another item, the list is empty.

PART 7

Creating Content

33

Managing Assets

About Assets

Assets is a centralized web-based repository that manages and controls digital marketing assets, such as images, documents, and video files. You can create, view, update, copy, move, share, and delete an asset. You can also preview an asset, create versions and renditions, and download assets. Using Assets enables you to upload, store, search, and retrieve assets; and distribute them for use or reuse through any web browser. For more information, see “Working with an Asset” on page 421.

You can upload and update several assets at one time. When you select several assets for upload or update, a batch job is initiated. You can view the job status and other information about the batch jobs. You can also use a template, such as a Microsoft Excel spreadsheet, to update several assets at one time.For more information, see “Working with Multiple Assets” on page 427.

You can toggle between a Tile view and a Table view. The Tile view displays thumbnails more prominently while the Table view displays more of the information associated with the asset. Within the table view, you can click ⋮ at the far right of the table header and select **Columns** to add or remove the columns displayed in the table. You can also sort the order of the columns, which enables you to display only the columns that are most useful for you in the table view.

Assets supports various file formats for images, documents, and video. For more information, see “Supported File Formats” on page 422.

You can integrate an external Content Management System (CMS) with SAS Customer Intelligence 360. Integrations with external CMSs must be enabled through configuration. After the integrations are configured, you can select assets from either SAS Digital Asset Management or an integrated CMS. For more information, see Chapter 63, “Integrating with Content Management Systems,” on page 829.

Working with an Asset

Create an Asset

To create an asset:

1 On the top menu bar, click . In an empty folder, click **Upload Asset**.

2 In the **Standard** properties section, enter this information:

- Enter a **Name** for the asset. If you do not enter a name, a default name or the name of the original file is applied. Do not use / or \ in the name.
- Enter a **Description** for the asset. Do not use / or \ in the description.
- Click **Browse** to select the original file to upload. You can save the asset without uploading a file and add the file later. A file size of 20 MB is supported for a single asset.
- Click **Browse** to select the appropriate location for the asset. The folder that you are currently in is the default location for the asset.

  (Optional) Select the **Generate custom renditions** check box to generate custom renditions for the asset. You can generate custom renditions that are specified in a configuration file. For custom renditions, the supported source file types are .tiff, .jpeg, .jpg, .bmp, .gif, .png, .dng, and .wpg. The resulting file types that are supported are are .tiff, .jpeg, .jpg, .bmp, .gif, .png, .pict, and .sgi. For more information, see “Create a Version” on page 425.
- Add or search for a tag in the **Tags** field. To add a tag, enter the text and click **Add to list**.

  TIP To add a tag, press **Enter** on your keyboard.

  Click **View all tags** to view all of the available tags. The tags are listed in the order in which they were added. Applying a tag to an asset enables you to collect information about how that asset is used and how often. For more information, see “About Tags” on page 99.
- (Optional) Select a **Category** for the asset.
- Click to select an expiration date for the asset.

  If you set expiration dates for assets, you can identify expired assets by prominent visual indicators in asset lists and open assets. Most asset operations, such as downloading files or viewing previews, are disabled for expired assets. You can filter asset lists by the expiration status—either expired or active. Filtering enables you to easily generate a list of all expired assets or only a list of active assets. You can reactivate an expired asset by modifying the asset expiration date.

  Note: If you modify the expiration date, you must save the asset before you complete any additional actions on the asset.

3 In the **Custom** properties section, enter or view information for your custom properties. For more information, see "Define Custom Properties" on page 143.

4 Click . The asset is uploaded, and a preview and a thumbnail are created for supported formats. The thumbnail is generated from the preview. Click **Close**.

Note: To manually add preview and thumbnail renditions (as well as other renditions), click the **Renditions** tab, and then click .

For a video asset, you can upload any file as the original asset file and upload the video file in a supported format as a preview rendition. The thumbnail image is generated by default. Click the asset to view the properties. The thumbnail image is displayed on the **Asset Details** tab. Click the image to play the video file in your browser, in the **Preview** window. Alternatively, in the Tile view for **Assets**, click ⋮ and click **Preview** to play the video.

Supported File Formats

Assets support various file formats for upload. However, only these types of file formats are supported for media processing and autogeneration of thumbnails and preview renditions:

- The supported image file formats are .tiff, .jpeg, .jpg, .bmp, .gif, and .png.

  Note: The .pcx file format is not supported for creatives. The supported image file formats for mobile in-app message and mobile push notification creatives are .jpeg, .jpg, and .png.

- The supported document formats include .xls, .xlsx, .ppt, .pptx, .doc, .docx, and .pdf.

- The supported video file formats include .mp4, .avi, .flv, . wmv, .mov, . mpeg, and .mpg.

  Note: Mp4 videos must conform to video H264 codec and audio AAC codec standards.

- The supported file formats also include HTML files.

  Note: The supported character encoding is UTF-8. Other formats in an uploaded HTML file might display garbage characters.

View and Edit an Asset

You can view and edit an asset and its properties, and create versions and renditions.

1 Click an asset.

2 On the **Asset Details** tab:

- Click the image to display a preview. Click **Close**.

  Note: Some browsers do not support a preview of some image types such as .tiff or .pcx. If you attempt to preview such an image, the system downloads it automatically.

- On the **Properties** page, view or edit the information. Click or **Close**.
- On the **Summary** page, view information about the asset.
- On the **Versions** page, view or edit the information. For more information, see "Create a Version".

When you are in an open asset, you can download the original or preview, save the file with a different name, or share the asset.

- To download the asset, click and select **Download Original** or **Download Preview**. The file appears at the bottom left of the screen. Ensure that your browser does not block pop-ups.

  Note: When an asset file is downloaded, the system creates a download URL that is used to download the actual file. If the filename in the URL contains special characters (for example, %) that are outside the character set of the American Standard Code for Information Interchange (ASCII), the URL converts such characters to a valid ASCII format before they can be used. This conversion results in a filename that is different from the original asset file.

- To save the asset with a different filename, click ⋮ and select **Save As**. Enter a name, select the location to copy the asset to, and then click **OK**.
- To share the asset, click ⋮ and select **Share**. Select the access level of the user that you want to share the asset with, copy the URL, and then click **Close**. Provide the link to the user.

From the Tile view, you can click ⋮ on each individual asset to preview the asset, download the original, download a preview, open the asset, delete the asset, move the asset, copy the asset, or share assets.

From the Tile view, you can also select an asset by clicking the check box in the upper left corner of the asset. You can then select other assets or click **Select all** to work with all of your assets. From the table view, you can select an asset by clicking the check box in the upper left corner of the asset. You can also select other assets to work with or all of your assets. You can then click ⋮ to complete these actions:

- To update attributes for the selected assets, click **Update Properties**. In the **Update Asset Properties** window, select the check box to edit the **Description** or the **Expiration date**. To clear existing values, select the relevant check box.

  Note: You cannot add a new value and remove the existing value simultaneously for a property field. Before you add a new value, clear the existing value and click **Apply**.

  > **TIP** Select the **Edit all fields** check box to enable updates for all fields in a single click.

- To share the selected assets, click **Share**. Select the access level of the user that you want to share the assets with, copy the URLs, and then click **Close**. Provide the links to the user.
- To move the selected assets, select **Move**. Select the location and click **OK**.
- To copy an asset, select **Copy**. Enter a name, select the location, and then click **OK**. All attribute values, other metadata, and renditions are copied from the source asset to the new copy.
- To download the selected assets, select **Download Assets**. You can select the original, the preview, or the thumbnail. The total size of the files is displayed.

Enter a filename and click **Create**. (Do not use /, \, :, ;,*, ?, <, >, or **|**.) Click **Download**. Ensure that your pop-up blocker is disabled.

- To create an attributes file, select **Download Properties File**. This Microsoft Excel file contains the standard properties (folder path, name, description, and expiration date) and any custom properties and tags associated with the assets. The file can be used as a template for batch uploads. Open the file to view or edit the attributes. You can then update your assets from the spreadsheet. Ensure that your pop-up blocker is disabled.

  Note:

  In the downloaded properties file, the Asset Information section is password-protected, and you cannot edit the Folder Path and Name columns. For more information and assistance, contact your SAS representative.

- To view the recycle bin, select **Recycle Bin**. For more information, see recycle bin.

- To update a file from Excel, select **Update from Excel**. For more information, see "Batch Update Assets from Microsoft Excel".

To search for an asset, click in the search box and enter the keywords. You can use keywords to search assets based on name, type, format, tags, and when the asset was modified by the user.

To filter assets, click . You can filter assets by **Type**, **Format**, **Status**, **Date Created**, **Last Modified**, **Modified By**, and **Expiration Date**.

View Usage Information

From the **Orchestration** ⇨ **Usage** tab, you can view which items use the asset.

The ability to view dependencies between items enables you to see the items that a task depends on to work successfully. Usage information helps you identify how changes that you make to one item might affect another item.

Items That Use the Asset

The table shows the items that use the asset.

- Click **Directly Related** to list the items that use the asset. For example, if a creative uses the asset, the creative is included in the list.

- Click **All Related** to view directly related items as well as any items that those directly related items use. For example, you might see the creative that uses the asset and a task that uses the creative.

  The list displays items with a Designing, Ready, or Active status.

To open an item, click the item. To view item details and to open the item, click in the item's row.

Note: HTML assets that are the content source for mobile spot, web spot, and email creatives are not listed.

Items That the Asset Uses

The second section shows items that the asset uses. Because an asset does not use another item, the list is empty.

Create a Version

To create a version:

1. Click an asset.
2. On the **Versions** page, click **+**.
3. Click **Browse** to select an image to upload.

   (Optional) Select the **Generate custom renditions** check box to generate custom renditions for the asset. You can generate custom renditions specified in a configuration file. For custom renditions, the supported source file types are .tiff, .jpeg, .jpg, .bmp, .gif, .png, .dng, and .wpg. The resulting file types that are supported are .tiff, .jpeg, .jpg, .bmp, .gif, and .png. For more information, see “Create a Version” on page 425.
4. Click **Browse** to select an image for the thumbnail. If not provided, a rendition is generated.
5. Click **Browse** to select an image for the preview. If not provided, a rendition is generated.
6. Add any **Comments** for the new version of the asset.
7. Click **Save**, and then click **Close**.

Click ⋮ to preview, download, restore, or delete the version. An active version cannot be deleted.

Create a Rendition

A rendition is a different base file format (for example, a different size, resolution, or format). Each asset version has a set of defined renditions.

If an asset was created without an original rendition, additional renditions cannot be created unless a new version is added to the asset.

1. Click an asset.
2. Click the **Renditions** tab to see the original asset, a preview of the asset, and a thumbnail of the asset. Additional renditions of the asset are also displayed.
3. Click **+** to create a rendition. Enter a **Rendition name**, and then click **Browse** to select the file to upload. For custom renditions, the supported source file types are .tiff, .jpeg, .jpg, .bmp, .gif, .png, .dng, and .wpg. The resulting file types that are supported are .tiff, .jpeg, .jpg, .bmp, .gif, and .png.
4. Click **Save**.

After a rendition is added, you can download, rename, delete, or replace the rendition:

- To download the rendition, click and open or save the asset.
- To rename the rendition, click and enter a new name. Click **Save**.
- To delete the rendition, click . Click **Yes**.
- To replace the rendition, click . Click **Browse** and navigate to the appropriate file to upload. Click **Save**.

Note: You cannot change the name or delete the standard system renditions (original, preview, and thumbnail). If you delete a user-generated preview or thumbnail, a default rendition is automatically generated.

Delete an Asset

To delete an asset:

1. On an asset, click and select **Delete**, or from the table view, select an asset and click . Click **Yes**.
2. Click **Yes** to confirm the deletion.

Deleted assets are sent to the recycle bin.

Recycle Bin

You can restore assets and permanently delete assets from the recycle bin. You can click at the far right of the table header and select **Columns** to add or remove the columns displayed in the table. You can also sort the order of the columns.

1. On the top menu bar, click and select **Recycle bin**.
2. To restore an asset, select the appropriate asset and click . Click **Yes** to confirm the restoration of the asset to its original folder.

   Note: If the original folder is not available, the asset is restored to the **Assets** folder. If the original folder is renamed, then the asset is restored to the renamed folder.

   Click **Select all** to restore all of the items in the recycle bin.
3. To permanently delete an asset, select the appropriate asset and click . Click **Yes** to confirm the permanent deletion of the asset.

   Click **Select all** to delete all of the items in the recycle bin.
4. Click **Close**.

You can also click and select **Delete** or **Restore**.

Working with Multiple Assets

Upload a Batch of Assets

To upload several assets:

1. On the top menu bar, click . In an empty folder, click **Upload Multiple Assets**.
2. Click **Browse** and select the assets to upload. A file size of 1 GB is supported for each asset file in a batch upload. However, the time it takes to upload several large files depends on your system performance and network connection and speed.
3. Click **Open** to see a list of the files. To add more assets, click +. Select the appropriate files from the list.
4. Click **Edit Properties** to edit any of the listed properties before uploading the files. Click to apply the same changes to other assets in the list. Click **OK**.
5. Click **Upload**.
6. A message indicates that the job was submitted successfully. Click **Close**.

Check the Job Information page for status updates. You can refresh the page to display the assets.

Update a Batch of Assets

To update several assets:

1. On the top menu bar, click .
2. Click **Browse** to select the assets to update.
3. Click **Open** to see a list of the files. To add more assets, click +. Select the appropriate files from the list to update.
4. Click **Edit Properties** to edit any of the listed properties before updating the files.

   Click to apply the same changes to other assets in the list. Click **OK**.
5. Click **Upload**.
6. A message indicates that the job was submitted successfully. Click **Close**.

   Note: You can batch update a group of assets if all of the assets have an expired status. However, you cannot batch update a group of assets if some assets have an expired status and some have an active status.

Check the Job Information page for status updates. You can refresh the page to display the assets.

View Job Information

To view job information:

1. On the top menu bar, click . The **Job Information** page lists your submitted jobs. You can click **Processes** to view the batch jobs.

   The job status is indicated by these icons:

   - indicates that the job completed successfully.

     Note: A message might indicate that the job completed with some errors.

   - indicates that the job failed.
   - indicates that the job is in progress.

2. To view the details of a job, in the **View Details** column, click . The job details window shows the list of successes and errors for the job. Errors are grouped by the type of error message.

   For batch upload jobs, click **Download the Upload Summary** and for batch update jobs, click **Download the Update Summary** to download a text version of the details.

3. (Optional) Click to refresh the page.
4. (Optional) Click to delete a job. You cannot delete a job in progress.
5. Click **Close**.

Batch Update Assets from Microsoft Excel

To batch update assets from a Microsoft Excel spreadsheet:

1. On the top menu bar, click and select **Download Properties File**. Ensure that your pop-up blocker is disabled.

   The downloaded Microsoft Excel file contains the standard properties, which include information about the folder path, asset name, description, and expiration date. The file also contains any custom properties and tags associated with the assets. The file can be used as a template for batch uploads. For the Microsoft Excel file .xls and .xlsx formats are supported.

2. Open the file to view or edit the properties. Only the first sheet of the spreadsheet is processed.
3. You can then import the modified file to update assets with the new values from the spreadsheet. On the top menu bar, click and select **Update from Excel**.
4. Navigate to the appropriate folder, select the spreadsheet, and click **Open**.
5. The mapped assets are updated according to the spreadsheet.

Working with Folders

You can create, edit, arrange, share, and delete folders. You can also configure views for folders.

Create a Folder

1. From the navigation bar, click **Assets**, and under **Folders**, click .
2. Enter a **Name** for the folder.
3. (Optional) Enter a **Description** for the folder.
4. Click **OK**.

Edit Folder Properties

1. Select a folder.
2. Click .
3. Edit the information on the **Properties** tab.

   Note: You can edit folder properties, depending on the user permissions that are assigned to you.
4. Click **Save**.

Move a Folder

1. Select a folder.
2. Click ⋮ and select **Move folder**.
3. Select the appropriate location.
4. Click **OK**.

Share a Folder

1. Select a folder.

2 Click ⋮ and select **Share Folder**.

3 Select the access level of the user that you want to share the folder with.

Select **Anyone with the link and authorized access** to enable only a SAS Customer Intelligence 360 user with the authorized permission to access the URLs.

4 Click **Copy**. The available URLs are copied to the clipboard.

5 Click **Close** and provide the copied URLs to the user.

Sort Folders

1 Click .

2 Sort the folders by **Name** or **Most recent**.

Configure Views

1 Click ⋮ and select **Configure views**.

2 Select whether you want to view assets for the selected folder only, or for the selected folder and subfolders.

3 Click **OK**.

Delete a Folder

1 Select a folder.

2 Click . If you delete the folder, all associated subfolders and assets are also deleted.

Note: You can delete a folder, depending on the user permissions that are assigned to you.

3 Click **Yes**.

The folder is sent to the recycle bin.

Note: You can restore a deleted folder only if you have Edit permission on the parent folder. When a deleted folder is restored, if the permission was not explicitly set for a user, the user inherits the folder permission from the parent folder.

Sharing Assets

Share the Link to an Asset

You can share a link to an asset with another SAS Customer Intelligence 360 user.

1 In the Tile view, select an externally shared asset, click ⋮ on the asset, and select **Share**. Or, you can select the asset from the Tile view or Table view, click ⋮, and select **Share**.

2 Select the access level of the user that you want to share the asset with.

   - Select **Anyone with the link and authorized access** to enable only a SAS Customer Intelligence 360 user with the authorized permission to access the URL.
   - Select **Anyone with the link** to enable any SAS Customer Intelligence 360 user to access the URL.

3 Click **Copy**. The available URLs are copied to the clipboard.

   Note: If the external sharing is not enabled for the asset, the URL is not displayed. To display the URL, you must first enable external sharing for the asset.

4 Click **Close** and provide the copied URL to the user.

5 Alternatively, to view the URL from an open asset, on the **Orchestration** tab, click **View Link**.

   Note: If the asset is not enabled for external sharing, View Link is not displayed.

Share Assets Externally

You can select one or more assets and make them available to external users. You can also select one or more externally shared assets and make them unavailable to external users. You can view the external sharing status in an open asset, on the **Orchestration** tab. You can also view the external sharing status for an asset in the Tile view and in the Table view. In the Tile view, externally shared assets are displayed with the label “External”.

Enable External Sharing

To enable external sharing for a single asset:

1 Navigate to the asset.

2 In the Tile view, click ⋮ on an asset and select **Enable External Sharing**.

> **TIP** An alternative action is to click the **Orchestration** tab in an open asset, and then click **Enable External Sharing**.

When you enable external sharing for an asset, an asset URL is generated, which is accessible to external users. On the **Orchestration** tab in an open asset, click **View Link** to view, copy, and share the URL. For more information, see "Share the Link to an Asset" on page 431.

To enable external sharing for several assets:

1 Select all of the assets for which you want to enable external sharing.

2 On the top menu bar, click ⋮ and select **Enable External Sharing**.

A batch update job is run to enable several selected assets for external sharing. To view the job information for the selected assets, click . On the **Job Information** page, click the **Processes** tab to see the job status. To view the log messages for the job, in the **View Details** column, click .

Note: You cannot enable external sharing for expired assets, assets with unsupported file formats, assets without original renditions, and assets that you do not have permission to edit. Currently, only image file formats are supported.

Disable External Sharing

To disable external sharing for a single asset:

1 Navigate to the asset that is enabled for external sharing.

2 In the Tile view, click ⋮ on an asset and select **Disable External Sharing**.

> **TIP** An alternative action is to click the **Orchestration** tab in an open asset, and then click **Disable External Sharing**.

To disable external sharing for several assets:

1 Select all of the assets for which you want to disable external sharing.

   Note: Only assets that are enabled for external sharing can be disabled.

2 On the top menu bar, click ⋮ and select **Disable External Sharing**.

   Note: If you disable external sharing, the items that use the externally shared assets might be affected.

A batch update job is run to disable several selected assets for external sharing. To view the job information for the selected assets, click . On the **Job Information** page, click the **Processes** tab to see the job status. To view the log messages for the job, in the **View Details** column, click .

Note: You can disable external sharing for assets only if you have Edit permissions for the selected assets.

Manage Externally Shared Assets

When you enable external sharing for one or more assets, a URL is generated for the original rendition of the asset. The URL refers to the location of the asset on the external content delivery server. If you update the asset or upload a new version, the URL remains unchanged and refers to the latest version of the original rendition of the asset.

However, if you replace the original rendition or upload a new version of the asset with an unsupported file type, external sharing is automatically disabled for the asset. Currently, only image file formats are supported.

If you delete an asset, or the asset expires, external sharing is disabled and the URL is inaccessible.

Filter Externally Shared Assets

Click the **Filters** tab to filter assets that are enabled for external sharing or disabled for external sharing. In the **External Sharing** section, select the check box next to **Yes** to filter assets that are enabled for external sharing. Select the check box next to **No** to filter assets that are disabled for external sharing. Select the check box next to **In Progress** to filter assets for which the job status is in progress.

> **TIP** Click to filter assets that are enabled or disabled for external sharing.

Monitoring Asset Performance

Use the information that is available from the **Insights** tab to monitor the asset performance over a period of time.

The **Asset Performance** section displays the reports for the performance of the open asset. In each report, below the graph, click **Weekday**, **Month**, or **Year** to display the information for the predefined time period. Alternatively, click at the top of the report and select a predefined time period from the drop-down list to filter report information. To view the performance of the asset for a channel, select an option from the **Channel** drop-down list.

Below each report, you can view information about the tasks that are associated with the asset. Use the scroll bars to view the complete information in the report.

You can view the following information about asset performance:

- Click the **Metric comparison** tab to view a report that compares asset metrics such as impressions and impressions viewable, or impressions viewable and conversions.
- Click the **Impressions** tab to view a report about the total impressions for an asset.
- Click the **Impressions Viewed** tab to view a report about the number of impressions that were viewed for the asset.

- Click the **Conversions** tab to view a report about user interaction with the asset that resulted in a conversion.

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Creating Creatives

About Creatives

A creative represents the content that a task delivers to a web page, via email, or to a mobile application. There are many ways to build creatives, including importing or using assets, using an HTML editor, or importing treatments from external applications. Creatives can be used in a spot or in a task, and you can group several creatives in a message.

For example, you can define a default creative for a spot so that the spot is never empty. Or, you can create a task that displays a creative on a web page when a known user is logged in. If you use merge tags or personalization variables in your creatives, you can deliver personalized content to your users.

The creative type that you select should match the type of content that you want to deliver.

HTML
: Use HTML to build creatives for web tasks, email tasks, and mobile spot tasks. You can edit the HTML source, embed content from a URL, embed assets, and add merge tags to personalize the creatives. Imported assets and treatments are saved as HTML creatives. For information about web creatives, see "Working

with Web Creatives" on page 688. For information about email creatives, see" Creating Email Creatives" on page 554. For information about mobile spot creatives, see "Creating HTML Creatives for Mobile Application Spots" on page 628.

When you build a creative from an asset, you can select assets from SAS Digital Asset Management, or from a third-party, content management system (CMS) that is integrated with SAS Customer Intelligence 360.

Mobile In-App Message
: Build the creatives that are displayed while a user is active within your mobile application. For more information, see "Creating Mobile In-App Message Creatives" on page 614.

Mobile Push Notification
: Build the creatives that are used in a push notification. For more information, see "Creating Mobile Push Notification Creatives" on page 619.

Plain Text
: Build a creative that uses plain text.

Recommendation
: Specify the information that a web task needs before the task can deliver personalized recommendations. A recommendation creative specifies the URL template that you want a task to use when making product recommendations. For more information, see "Working with Web Creatives" on page 688.

Importing Creatives

You can import treatment offers from external applications to be used as creatives in SAS Customer Intelligence 360.

Note: The treatment offer must be in a file format that is supported by SAS Customer Intelligence 360.

To import a creative:

1 From the navigation bar, click **Creatives**.

2 Click ⋮ and then select **Import Creatives**.

3 Select one or more treatment offers that you want to import.

   Note: An imported treatment offer cannot be used as a creative if the offer has already been imported as a message. Delete the existing message and re-import the treatment offer.

4 (Optional) Select **Edit Properties** to modify the message name and description.

5 Click **Import**.

   Note: Custom details that are supported by SAS Customer Intelligence 360 are mapped to the properties for the creative. For more information about custom details for treatments, see the documentation for the external application.

For information about viewing the status of the imported creative, see "View Job Information".

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Creating Messages

Messages are used to group creatives together and typically contain one or more creatives. You can either import treatment offers from external applications to be used as messages or you can create an empty message and then add creatives to it.

About Messages

Messages give you a way to organize creatives by grouping them together, regardless of the channel for which the creatives are designed. After a message is active, that message and its creatives can be associated with a planning item or a task.

Note: Only direct marketing tasks can use a message that does not contain a creative. All other task types display only messages that contain at least one creative.

For example, you create a message that contains all of the channel-specific creatives that are associated with an upcoming sale on bicycles. When creating the different types of tasks that deliver your creatives, you can select the same message for all of the tasks and choose the creative that is appropriate for the task type. In other words, your message can contain the following creatives, each intended for a specific task type and channel:

- an HTML creative that contains text announcing 10% off of new bicycles and a picture of the best-selling bicycle. Select this creative when you create the web task that displays this creative on your web page.
- a plain text message for 10% off bicycles that can be used as a mobile push notification. Select this creative when you create the mobile push notification task that sends a text message to your customers to notify them of the sale.
- a custom property that specifies that the offer is a 10% discount that applies to new bicycles. Select this message when you create a direct marketing task that exports a text file that contains this offer information.

Here are some of the actions that you can accomplish with messages:

- import a treatment offer from external applications as messages
- add a message to a planning item so that you can associate the message and its content with your marketing strategy
- add a message to a task so that you can manage which creatives can be delivered by a task

For more information about the different uses for messages and details about creating them, see these topics:

- " Creating Email Messages" on page 557
- "Creating Mobile Messages" on page 635
- "Creating Web Messages" on page 698

Creating Messages

Messages give you flexible ways to group creatives that are associated with each other. For example, you can create a message that contains all of the creatives that are needed to support a particular campaign across multiple channels. Alternatively, you can create a message that contains all of the creatives for a specific channel.

Typically, a message contains one or more creatives, and messages that do not contain any creatives are not available for selection in tasks and planning items. However, direct marketing tasks are an exception to this rule, because those task types do not use creatives. If you are creating a direct marketing task, instead of adding creatives to your message, you must define the properties that need to be included in the export file on the **Properties** tab of the message.

To create a message:

1 From the navigation bar, click **Messages**.

2 Click .

3 Add your creatives on the **Creative** tab using a combination of the following options:

- Click **New Creative** to build a creative that is automatically added to the message. The new creative is also added to the list of creatives on the **Creatives** page.
- Click **Add Existing Creative** to add a creative that is already in the system. Select one or more creatives and click **Done** to add them to the message.
- Click ⋮ and select **Add Creative from Asset** to import an HTML asset as a creative. Only HTML assets can be imported into messages as creatives.

  Note: Mobile in-app message tasks and mobile push notification tasks do not support HTML creatives. As a result, you cannot use assets that are imported as creatives in either a mobile in-app message task or a mobile push notification task. However, you can use assets that are imported as creatives in other task types.

Note: You can add different creative types to a message. However, the **Recommendation** creative type is available only after a URL template has been created in **General Settings** ⇨ **Analytic Settings** ⇨ **Recommendation Task**.

> **TIP** After a message contains one creative, you can add more creatives by clicking + to add an existing one or click to create one.

4 (Optional) Navigate to the **Properties** tab to add properties to the message. For example, if this message is going to be used in a direct marketing task, you can add custom properties that contain information that you want to be exported. For more information, see “Message Properties” on page 440.

5 Click to save the message.

6 When your message is ready to be published, navigate to the **Orchestration** tab and update the status.

Note: If you have not already saved your message, you are prompted to save it now.

- Select **Mark Ready** to change the status from Designing to Ready. A Ready status indicates that this item is ready to be published. When you are ready to promote an item from a Ready status to an Active status, click **Publish**.

  Note: When you publish an item, you are prompted to publish any dependent items that are marked Ready.

  Items with a Ready status can be changed back to a Designing status by clicking **Return to Designing**. Changing this status to Designing prevents the item from being published.

  Note: If your item has a Ready status and a start date, the item is not automatically published when the start date is reached. For example, if you are creating a task, it must be published in order for the start date to activate the task.

- Select **Mark Ready and Publish** to change the status from Designing to Active. Items with an Active status cannot be changed back to Designing.

> **TIP** You can edit, rename, or remove a creative that is included in a message from the **Creative** tab in the message. To access actions that are related to a creative, click ⋮ on the creative.

For more information about the different uses for messages and details about creating them, see these topics:

- " Creating Email Messages" on page 557
- "Creating Mobile Messages" on page 635
- "Creating Web Messages" on page 698

Importing Messages

You can import treatment offers from external applications to be used as messages in SAS Customer Intelligence 360.

Note: The treatment offer must be in a file format that is supported by SAS Customer Intelligence 360.

To import a message:

1 From the navigation bar, click **Messages**.

2 Click ⋮ and then select **Import Messages**.

3 Select one or more treatment offers that you want to import.

   Note: An imported treatment offer cannot be used as a message if the offer has already been imported as a creative. Delete the existing creative and re-import the treatment offer.

4 (Optional) Select **Edit Properties** to modify the message name and description.

5 Click **Import**.

   Note: Custom details that are supported by SAS Customer Intelligence 360 are mapped to the properties for the message. For more information about custom details for treatments, see the documentation for the external application.

For information about viewing the status of the imported message, see "View Job Information" on page 445.

Message Properties

Navigate to the **Properties** tab of the message to see information about the message or to add offer-related information to a message that is meant for a direct marketing task.

The **Standard** section contains basic information about a particular message, such as the name, type, description, category, and external code. Not all fields in this section are required. Some of the fields in the **Standard** section include the following:

- The **Category** field is displayed only if the properties available in the system have been assigned a category.

- The **Code** field is needed to map treatments from external applications.

  When a treatment is imported or migrated to SAS Customer Intelligence 360 from an external application such as SAS Marketing Automation, the existing value for the object appears in the **Code** field. Depending on the code settings for your environment, the code value might be editable. This value is not required to be unique to be valid. If the value is editable, you can change it to match the code value for another item. Valid characters for codes are alphanumeric characters, multi-byte characters, numerals, underscores, hyphens, and periods. Blank spaces are not allowed in code formats.

  The code is also used as the unique identifier for a creative when the creative is going to be served as part of a staged creative web or mobile HTML task. For more information, see "Select the Task Type" on page 733.

  Note: External codes and dynamic tags are intended for use with a staged creative task. If you use a creative with a dynamic tag in a web task that is not a staged creative task, only the default tag value is displayed on the content that the task delivers.

In the **Custom** properties section, add, remove, or select custom properties. For more information, see Chapter 16, "Setting Standard and Custom Properties," on page 141.

View Usage Information for a Message

From the **Orchestration** ⇨ **Usage** tab of the message, you can view which items use the message and the items that the message uses. The ability to view dependencies between items enables you to see the items that a task depends on to work successfully. Usage information helps you identify how changes that you make to one item might affect another item.

Items That Use the Message

The first section shows the items that use the message. For example, if the message is used in a task, the task is included in the list.

The Priority column displays the priority of like tasks that use the message. Priority applies only to mobile spot, web spot, and mobile in-app message tasks because each of those task types might have two or more tasks that compete for the same resources. Other task types do not use prioritization.

For non-A/B test tasks, priority is on a scale of 1 through 5 (where 1 is the highest). The default is 3. An A/B test task has a priority of Test, which is higher than a non-A/B test task. An A/B test task always delivers its content.

You can change the priority of a non-A/B test task on the task's **Orchestration** ⇨ **Priority** tab.

Items That the Message Uses

The second section shows items that the message uses.

- Click **Directly Related** to list the items that the message uses. For example, a message includes one or more creatives. The creatives are included in the list.
- Click **All Related** to view directly related items as well as any items that those directly related items use. For example, you might see the creative that the message includes and an asset that is used by that creative.

  The list displays items with a Designing, Ready, or Active status. Click **Show Designing Status only** to display only items with a Designing status.

To open an item, click the item. To view item details and to open the item, click ⓘ in the item's row.

Note: HTML assets that are the content source for mobile spot, web spot, and email creatives are not listed.

Update Messages

In addition to creating and accessing messages on the **Messages** page, there are actions that you can take to manage your messages.

- You can rename or copy a message. Select a message, click ⋮, and then select either **Rename** or **Copy**.

  Note: To see the updated message name in an open item, such as a task, you might need to refresh the open item.

- You can delete the message. Select a message and click 🗑.

  Note: You cannot delete a message that is included in an active task. When you delete a message, the message is removed from SAS Customer Intelligence 360.

TIP There are two ways to open a message. You can either click the message from the list, or you can select the message and click 📂.

Removing Creatives from a Message

Deleting a creative removes the creative from the message but not from SAS Customer Intelligence 360.

TIP A creative that is deleted from a message can still be accessed from the **Creatives** page.

To remove the creative from a message, navigate to the **Creative** tab and find the creative that you want to remove.

1 Click ⋮ on the creative.

2 Click **Delete**.

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Managing Creatives and Messages

Dependencies between Messages and Creatives

The status of messages and creatives that are associated affect what you can do with each item.

For example, the status of a creative that is included in a message affects your ability to publish that message.

- If any creative has a Designing status, the message cannot be published.
- Creatives that have a Ready status are published when the message is published.
- If a creative is out of sync, publishing the message does not update the creative. Instead, the creative that is currently published remains published.

And the status of a message also affects any creatives that are associated with that message.

- Creatives that are part of an active message (marked Ready or Published) cannot be deleted or moved to a status of Complete.
- A creative can be removed from the message at any time. This action removes the association between the creative and message, but the action does not delete the creative or change the status of the creative.

View Job Information

To view job information:

1. On the top navigation bar, click . The **Job Information** page lists your submitted jobs. You can click **Processes** to view the batch jobs.

The job status is indicated by these icons:

- indicates the job completed successfully.
- indicates the job failed.
- indicates the job is in progress.

2 To view the details of a job, click . The **Job Details** page shows the list of successes and errors for the job. Errors are grouped by the type of error message.

Note: The page lists the treatment custom details that were not imported because they are not supported by SAS Customer Intelligence 360.

3 (Optional) Click to refresh the page.

4 (Optional) Click to delete a job. You cannot delete a job in progress.

5 Click **Close**.

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Personalizing Content

There are several ways to personalize the content that SAS Customer Intelligence 360 delivers. You can add personalized customer information, such as a name, to a creative. Or you can have a creative display behavioral information about a user, such as a cart total. Alternatively, you can specify that a task distributes different creatives to subgroups of your target audience based on characteristics such as gender. You can also deliver recommendations that are determined using either a user's behavior or what product is being viewed.

Adding Personalized Information to Creatives

You can build a creative so that it displays personal information about a user when the creative is delivered. For example, you can create a creative that displays a person's name, age, details about their virtual shopping cart, or information about a product that was recently viewed. To personalize a creative with information about a user, add a merge tag. A *merge tag* is a placeholder that a task replaces with information about a user or the user's behavior.

For HTML creatives, you have the option of inserting a personalization variable in place of a merge tag. This variable allows the merge tag to be selected in the task, instead of in the creative.

About Merge Tags

Merge tags are resolved by a task at the time that the content is delivered. For example, if your web task contains a creative that uses a merge tag for a customer's name, when the web task delivers the creative to a web page, that creative contains the appropriate customer name.

A merge tag can be resolved with the information that is available from imported customer data. Imported customer data contains information about a user's characteristics, such as demographic information or the customer name. A creative that contains a merge tag displays the same personalized information, regardless of the task that is delivering the creative. For example, in a web task, a creative with a merge tag displays a customer's name. If you reuse that same creative in other tasks, the creative's merge tag still resolves to a customer name.

If you are creating an HTML creative, you have the option to insert a variable for the merge tag. Variables give you more flexibility by allowing the merge tag to be selected later, after the creative is added to a task. In addition, personalization variables can display either imported customer information or behavioral information. The behavioral information, such as a cart total or the name of a product that a person has added to their cart, is retrieved from an event or data view. Because personalization variables enable you to select the merge tag while designing the task, you can reuse the same creative to display different types of personalized information. For example, in a web task, a creative with a variable can display a cart total and in a mobile task the same creative can display a customer name.

Conditional Merge Tags

If you are creating Mobile Push Notification creatives or Email creatives, you can use conditional merge tags to build more complex personalized content. Conditional tags allow different content to be displayed for different types of users. For example, using conditional merge tags, you can have one creative that displays different text based on the gender of the user:

- Content viewed by men contains the greeting “Dear Sir”.
- Content viewed by women contains the greeting “Dear Madam”.
- If the gender of the user viewing the content is unknown, “Dear Customer” is displayed.

Prerequisites

To successfully use merge tags, fulfill these prerequisites:

- Ensure that the imported customer data available contains attributes that are modified to use merge tags. For information about importing external customer data, see “Importing and Exporting Identity Data” on page 175.

Note: If a customer record is removed or updated with an identity import, and that record is referred to in a merge tag, the merge tag value is not updated to reflect the record. To make sure that the merge tag is referring to an accurate record, take one of these actions:

- Delete the identity data on page 251.
- Import data for the customer, using the data hub ID, customer ID, or another known ID. In the CSV file, make all the entries blank in order to overwrite the values in the system. For more information, see Chapter 20, “Importing Data,” on page 185.
- If the personalized information that you need to retrieve originates from an external application, you need to set the appropriate properties and external code in the creative. Then you can create a Staged Creative task to deliver the information.
- If you are using a creative with a personalization variable that retrieves behavioral information, an event or data view that contains at least one attribute must exist and be active. In addition, the task that uses the creative must include the event or data view as part of the targeting criteria.

  Note: You can insert a personalization variable in a creative at any time, but you cannot use it successfully without these prerequisites.

How Tasks Use Merge Tags and Variables

Tasks use personalized creatives to deliver content to a user that is customized for that user. In other words, when a task delivers a creative that includes a merge tag, that merge tag is resolved before content delivery. If the task delivers a creative that contains a personalization variable, you select the merge tag to use in place of the variable while you are designing the task. After you select the merge tag in the task, the task can resolve the merge tag and display the personalized content.

For example, to display content personalized with a user’s name and cart total on a web page, you need these items:

- a creative that contains a merge tag for the user name and a variable for the cart total.

  > **TIP** You can assign a default value to a merge tag to account for times when the information that the merge tag needs is not available.

- a web task that uses the personalized creative. In this example, the name that is displayed to the user is retrieved from customer information that was imported into the system. The cart total is retrieved from an attribute of a cart view event.

After adding the creative to a web task and publishing the task, users who view the web page can see content containing their name and cart total.

Examples

There are many applications for merge tags and variables.

- Offer a personalized discount via a mobile push notification. When new customers sign up for a program that offers childcare supplies, a personalized welcome message is sent that invites each new customer to open an application and receive a discount. For steps detailing how to create this example, see "Creating Mobile Push Notification Creatives" on page 619 .
- Send an email with text that changes depending on whether you know the recipient's age. For example, if you do not know a recipient's age, your email includes the text "We do not know how old you are, but we bet you are young at heart!". However, if you know that the recipient is 55 years old, then the email includes this text instead: "It is great to be 55 years old!". For steps detailing how to create this example, see "Add a Merge Tag to Personalize Text" on page 572.
- Display a personalized message to users on your website who add a particular product to their cart. This example uses attributes from an Add to Cart event to personalize web content. For steps detailing how to create this example, see "Example: Use Variables and Merge Tags to Target Event Attributes" on page 632.
- Display the specific product name, quantity, and SKU when one of a number of products is added to a cart on your website. This example uses attributes from a data view. For steps detailing how to create this example, see "Example: Use Variables and Merge Tags to Target Data View Attributes" on page 632.

Support for Merge Tags and Variables

Merge tags are supported in these types of content:

- Email creatives
- HTML creatives
- Mobile Push Notification creatives

Note: Only HTML creatives support the use of variables as placeholders for merge tag data. Only Email and Mobile Push Notification creatives support conditional merge tags.

Distributing Creatives to Audience Subgroups

In a task that contains multiple creatives, you can deliver different creatives to a subset of a task's audience. By assigning different criteria to each creative in a task, you can control which creatives are displayed to which subset of the target audience.

About Rule-based Targeting

When you have a task that contains multiple creatives, you refine which groups of the task's target audience get a specific creative by adding additional targeting criteria to each creative. Adding targeting criteria to creatives is one option for defining how a task distributes creatives. The distribution option that enables you to set different criteria for each creative within a task is known as **Rule-based** targeting. Using rule-based targeting, you can create an email task that contains the following information:

- one creative that contains a picture of men's apparel
- one creative that contains a picture of women's apparel
- one creative that contains apparel suitable for a man or woman

By specifying criteria for your email creatives for the rule-based option, you can send content to the appropriate user. For example, you can set up your email task to ensure this information:

- Users whose gender is male see the picture of men's apparel.
- Users whose gender is female see the picture of women's apparel.
- Users whose gender is not known see the picture suitable for either a male or female.

Support for Rule-based Targeting

These task types support targeting creatives for different subgroups of a task's target audience:

- Email tasks
- Mobile Push Notification tasks
- Mobile In-App Message tasks
- Mobile Spot tasks
- Standard Web tasks
- Recommendation Web tasks

Recommending Content

About Recommendation Tasks

When a user views a product on a web page, you might want to display other related content. You can create a web task that displays different creatives based either on a product being viewed or a user's behavior. There are two methods for delivering recommendations to users. User-centric recommendations take a user's behavior into account. Product-centric recommendations are based solely on a product.

Note: Recommendation tasks are supported only for web tasks.

Before you can successfully create a recommendation task, an administrator has to configure some settings in **General Settings** ⇨ **Analytic** ⇨ **Recommendation Task**. The following prerequisites must be met for user-centric and product-centric recommendation tasks.

Prerequisites for User-Centric Recommendations

Before you can create a recommendation task based on user behavior, these items must exist:

- a product view event that contains the attributes that you want to base recommendations on. The product view event that you use for user-centric recommendations must have either a Product ID or Product SKU attribute. It is recommended that the product view also contain a Product Group attribute to ensure that all visitors receive recommendations. For more information, see "Creating Product View Events" on page 323.

  Note: Publish the product view event before publishing the task to ensure that the system has enough time to collect the data needed to generate recommendations.

- a URL template for the product view event attribute that you want to base recommendations on. For more information, see "Creating Web Messages" on page 698.

  Note: The URL template must exist when the task is being created. However, when a URL template is selected for the task, the task makes its own copy of the URL template. If any subsequent changes are made to the URL template in use, the recommender creative needs to be republished.

- a message that contains a recommendation creative. The recommendation creative must contain the URL template for the creatives that you want the system to use when making recommendations. For more information, see "Recommendation Task" on page 104.

Prerequisites for Product-Centric Recommendations

Before you can create a recommendation task based solely on a product, these items must exist:

- a spot with at least one attribute named either *product_sku* or *product_id*.
- a product view event that contains the attributes that you want to base recommendations on. The product view event that you use for product-centric recommendations must have a Product Group attribute and either a Product ID or Product SKU attribute. For more information, see "Creating Product View Events" on page 323.

Note: Publish the product view event before publishing the task to ensure that the system has enough time to collect the data needed to generate recommendations.

- a URL template for the product view event attribute that you want to base recommendations on. For more information, see "Creating Web Messages" on page 698.

  Note: The URL template must exist when the task is being created. However, when a URL template is selected for the task, the task makes its own copy of the URL template. If any subsequent changes are made to the URL template in use, the recommender creative needs to be republished.

- a message that contains a recommendation creative. The recommendation creative must contain the URL template for the creatives that you want the system to use when making recommendations. For more information, see "Recommendation Task" on page 104.

PART 8

Prerequisites for Content Delivery

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Working with Spots

About Spots

A spot is the place on a mobile application or web page where a task delivers content. When you create a spot, you specify the location on a mobile application or web page where you want content to appear. You can also define spot attributes for use in data collection and task targeting. When you create a task, you select the spot that you want the task to deliver content to.

Create spots by navigating to **Spots** and clicking .

The type of spot that you create depends on whether you are delivering content to a mobile device or a web page.

- Select **Mobile** to define the place in a mobile application where a message is displayed. For more information, see "Creating Mobile Spots" on page 637.
- Select **Web** to define the place on a web page where creatives are displayed. For more information, see "Creating Web Spots" on page 699.
- Select **Web Single-Page Set** to create a set of spots on a single web page. Use single-page sets to coordinate the delivery of your content to multiple same-page spots at once. For more information, see "Creating a Web Spot Set" on page 702.

- Select **Web Multi-Page Set** to create a set of spots on different web pages. Use multi-page sets to coordinate the delivery of your content to multiple spots on different pages. For more information, see "Creating a Web Spot Set" on page 702.

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Working with Data Views

About Data Views

Data views enable you to contextualize and reuse behavioral data for events in a way that is not dependent on the channel type. When you associate one or more events with a data view, attributes from the events can be combined and framed by rules that you define.

By creating a new, aggregate item known as a data view, you can create complex scenarios based on single events. You can take advantage of the events' flexibility to use them as metrics (for activities and tasks) and targeting (for tasks), and to run performance analysis on the associated tasks and activities.

The workflow for using a data view might be similar to these steps:

1. Create events in SAS Customer Intelligence 360 for the website or mobile app.
2. Create a data view to add business context to these events.
   - Data views can be made up of one or more events.
   - Events in a data view are associated by an OR relationship.
3. Use the data view as a metric for a task or activity.
4. Use the data view for task targeting, including targeting at the creative level.
   - You can still use events and segments in targeting in combination with data views.
   - From a task, you can further specify the attribute conditions of a data view. For example, the data view could include an event where the cart total is USD 50, whereas the task could specify that the cart total must be greater than USD 75. Therefore, triggering conditions for a data view might not meet the conditions that are defined for a task’s metrics.

     Note: Attributes are joined to data views by an AND operator. Make sure that you do not define conflicting attributes that result in a condition that cannot be met.
   - A data view can be defined once and then reused for multiple tasks.

   Note: Data views might affect how you are using existing tasks and activities:
   - Tasks and activities that are already published will continue to work. However, if you want to modify or republish existing items, you must convert them to use data views.
   - For tasks and activities that are not published, metrics must be converted to use data views instead of events.
5. Analytics is run on the data view to compare performance across the tasks and activities.

Creating Data Views

Data views enable you to combine the attributes and data from one or more events to create an item that can be reused for targeting and analysis.

Create Data Views

To create a data view:

1. From the navigation bar, click **Data Views**.

2 On the **Data Views** page, click .

3 On the **Conditions** tab, add one or more existing events.

Note: Currently, events can be combined only with the **Any of the following** option (which is a logical OR association). As a result, creating a nested group (with) has no discernible effect.

a Click .

b Enter the name of an event in the criteria's text field, or click and select an event.

c (Optional) Refine the event's attributes. Click . The attributes that you can modify are based on the attributes that are associated with the original event.

Attributes that you modify do not affect the attributes for the event itself. The attributes in this panel affect how the event is processed for this data view only, so you can use an event in multiple contexts without changing its underlying definition.

d (Optional) After you add all the events, you can click to review the summary of how your events are used in this data view.

4 On the **Attributes** tab, review all of the attributes associated with this data view. This list is an intersection of the attributes from all of the events.

Note: Data view attributes can be used in personalization variables if the attribute is listed on this tab.

5 On the **Orchestration** tab, complete one of these actions:

- Select **Mark Ready** to change the status from Designing to Ready. A Ready status indicates that this item is ready to be published. When you are ready to promote an item from a Ready status to an Active status, click **Publish**.

  Note: When you publish an item, you are prompted to publish any dependent items that are marked Ready.

  Items with a Ready status can be changed back to a Designing status by clicking **Return to Designing**. Changing this status to Designing prevents the item from being published.

  Note: If your item has a Ready status and a start date, the item is not automatically published when the start date is reached. For example, if you are creating a task, it must be published in order for the start date to activate the task.

- Select **Mark Ready and Publish** to change the status from Designing to Active. Items with an Active status cannot be changed back to Designing.

If the content of a published item is changed and saved, that item becomes out of sync with the published version. To synchronize the content, select **Republish**. Otherwise, the item stays out of sync with the published version and the updates are not delivered.

For more information, see "Republishing Out of Sync Items" on page 138.

Note: If a task or activity is using a data view that is published, you cannot modify the data view's conditions. Other properties (such as the name) can be modified even if the data view is consumed by other items.

6 From the **Orchestration** ⇨ **External Availability** tab, select the agents that you want to send the data view to. You can click ⓘ to view more information about the agents.

7 (Optional) Click ⋮ and select **Properties** to add a name and a description.

8 Use your data view in a task or activity to complete these actions:

- Set metrics for an activity or task.
- Add a target audience to a task.

Manage Data Views

From the **Orchestration** ⇨ **Usage** tab, you can view which items use the data view and the items that the data view uses.

The ability to view dependencies between items enables you to see the items that a task depends on to work successfully. Usage information helps you identify how changes that you make to one item might affect another item.

Items That Use the Data View

The first section shows the items that use the data view. For example, if the data view is used in a task, the task is included in the list.

The Priority column displays the priority of like tasks that use the data view. Priority applies only to mobile spot, web spot, and mobile in-app message tasks because each of those task types might have two or more tasks that compete for the same resources. Other task types do not use prioritization.

For non-A/B test tasks, priority is on a scale of 1 through 5 (where 1 is the highest). The default is 3. An A/B test task has a priority of Test, which is higher than a non-A/B test task. An A/B test task always delivers its content.

You can change the priority of a non-A/B test task on the task's **Orchestration** ⇨ **Priority** tab.

Items That the Data View Uses

The second section shows items that the data view uses.

- Click **Directly Related** to list the items that the data view uses. For example, if a data view uses an event, the event is included in the list.
- Click **All Related** to view directly related items as well as any items that those directly related items use. For a data view, the list of directly related and all related items is the same.

  The list displays items with a Designing, Ready, or Active status. Click **Show Designing Status only** to display only items with a Designing status.

To open an item, click the item. To view item details and to open the item, click ⓘ in the item's row.

About Attribution

Overview

A *customer journey* is a set of actions, or touchpoints, that a customer takes before converting. These touchpoints often cross channels, devices, and sessions. For example, a customer might click a paid search result for a product, and then see an ad for that product in a social media feed. In addition, the customer might receive an email or a message on a mobile device about the product. How do you know which of these touchpoints—the email, mobile message, search result, or social media advertisement—contributed to the final conversion?

Attribution is the process of identifying touchpoints along a customer journey and assigning credit to those touchpoints so that you can analyze the contribution of each of these touchpoints toward the conversion. In order to determine attribution, analytics first discovers customer journeys for conversions and then assigns credit to the touchpoints in those journeys.

Analyzing Customer Journeys

Attribution analysis builds a customer journey by finding a conversion for the data view, and then identifying the touchpoints that led to that conversion. Attribution analysis is completed using two approaches: rule-based and analytical. Rule-based methods build customer journeys using touchpoints that have occurred prior to the conversion. An analytical method is not bound by a time period. Instead, the customer journeys that are identified by analytical methods have an association with the data view.

You can explore the results of both methods on the **Attribution** tab of the data view that you are interested in. The customer journeys built using analytics depend on data-driven decisions that identify whether a customer journey is worth evaluating. The rule-based method for building customer journeys depends on changing a parameter such as maximum number of touchpoints specified for a customer journey.

Assigning Credit to Touchpoints

After a customer journey is created, each touchpoint in that journey is allocated a share of the credit for the conversion. This credit is known as a touchpoint's attribution share. There are several models on the **Attribution** tab that you can use to explore a touchpoint's attribution share. To understand the differences in how each model weighs each touchpoint in the customer journey, consider this example:

A person sees an advertisement for your product in her social media feed. The next day, she sees the same advertisement in her social media feed and clicks it to go to your site, but does not buy the product. Two days later, she receives an email advertising your product, which she opens. This email takes her to your website, where she finally buys the product.

The following industry-standard models are available:

- First Touch: The first touchpoint that the customer interacts with before converting receives 100% of the credit. For example, this model assumes that the first touchpoint on the social media site is the only reason that the customer bought your product. The second social media and email touchpoints get no credit for the conversion.
- Last Touch: The last touchpoint that the customer interacts with before converting receives 100% of the credit. For example, this model assumes that the email is the only reason that the customer bought your product.
- Linear: All touchpoints in the customer journey receive equal credit for the conversion. For example, this model assumes that the social media and email touchpoints had the same influence on the conversion.
- Position-based: The sequence of the touchpoints determines how much credit a touchpoint receives. The first and last touchpoints receive 40% of the credit, and intermediate touchpoints get a proportional share of the other 20%. For example, the first social media touchpoint and the email touchpoint each receive 40% of the credit. The second social media touchpoint is allocated the remaining 20% of the credit. Note: If there is only one touchpoint, it receives 100% of the credit toward the conversion. If there are only two touchpoints, they each receive 50% of the credit.
- Time Decay: The touchpoints closer to the time of conversion receive more credit. For example, the time decay model assumes that the email is the primary reason for the conversion because opening the email was the last thing the customer did before converting.
- Analytic: Credit is allocated to each touchpoint using a prediction model that takes into account the sequence of touchpoints. The model also takes into account when each touchpoint occurred relative to the last touchpoint. For journeys that ended in a conversion, the last touchpoint is the conversion event.

In addition, we provide two models that can be customized to analyze the traffic source types that you are interested in. These models display the total contribution of all touchpoints that match the traffic source type selected. By default, these models use Affiliate as the traffic source.

- Custom Recent with Exclusions: In this model, the touchpoint that you specify does not receive credit when it is part of a customer journey. Instead, the last touchpoint that you did not specify is given credit. For example, if you selected Email, then the email touchpoint would not receive any credit for the conversion. Instead, the social media touchpoints would receive all of the credit for the conversion.
- Custom Recent: In this model, the last instance of the touchpoint that you specify receives all of the credit. For example, if you selected Email, then the email touchpoint would receive all of the credit for the conversion.

Analyzing Attribution

Use the information displayed on the **Attribution** tab to view attribution share for your data view.

Understanding the Attribution Share Graph

The Attribution Share graph shows a touchpoint's contribution toward a conversion across all customer journeys. Any touchpoint found in a customer journey is displayed on this graph. Each touchpoint contains a set of bars, one bar for each model. You can position your mouse pointer over a bar to see information about the touchpoint, such as the percentage of its attribution share.

Note: These touchpoints are managed on the **Classification** ⇨ **Traffic Sources** page.

Updating the Attribution Share Graph Settings

The attribution graph displays information for only external traffic sources. The analysis period and maximum path time settings for the analytics are displayed above the attribution graph. You can edit the values for the analysis period, maximum path time, and other settings for this graph to suit your needs.

1 Click .

2 Navigate to the **Default Parameters** page.

- **Analysis Period**: Select the time period that the graph covers. For example, if you select **60 days**, the graph displays information for the previous 60 days. By default, **Analysis period** is set to **30 days**.
- **Maximum path length**: Select the maximum number of touchpoints that a customer journey can contain. By default, the **Maximum path length** is set to **30 touchpoints**. Consider the number of touchpoints in a typical customer journey that might be required to result in a conversion. The touchpoint varies by analysis model. For example, for analysis using the Traffic Sources model, the maximum path length determines the number of sessions that might influence a conversion.

  Note: Customer journeys that contain more touchpoints than this value are divided into two or more paths.

3 Navigate to the **Rule-Based Model** page to customize the settings that are related to the models used in the graph.

- **Maximum path time**: Select the maximum time period that can occur before the conversion in order for a customer journey to be included for analysis. For example, selecting **14 days** includes the touchpoints that precede a conversion by 14 or fewer days. When you select a longer time period, the attribution model includes more touchpoints than selecting a shorter time period. By default, **Maximum path time** is set to **7 days**.

- **Half-life for time decay model**: Select the number of days for the half-life. The half-life value affects the decay rate of the Time Decay model. The decay rate is the rate at which touchpoints that occur earlier in the customer journey lose credit compared to the touchpoints that occur later in the customer journey. A higher half-life results in a slower decay rate, because the decay takes longer to occur. Touchpoints that occur far from the conversion event receive a higher attribution credit under a larger half-life value than they would under a smaller half-life value. By default, **Half-life for time decay model** is set to **3**.
- **Custom Recent**: This is one of the models that you can customize by selecting a touchpoint for the model. The last instance of the touchpoint that matches the selected traffic source receives all of the credit for a conversion. By default, the touchpoint for this model is set to **Affiliate**.
- **Custom Recent with Exclusions**: This is one of the models that you can customize by selecting a touchpoint for the model. Select the traffic source that you want to ignore when it is part of a customer journey. The traffic source that you select does not receive any credit toward the conversion. Instead, the last touchpoint that is not the one that you selected is given credit. By default, the touchpoint for this model is set to **Affiliate**.

Using Touchpoint Analysis to Explore Model Results

Because every model allocates credit differently, there can be disadvantages to exploring only one model type. For example, the first and last touch models are easy to understand but might be oversimplifying a complex customer journey. The equally weighted attribution of a linear model might hide a touchpoint that is more effective than your other touchpoints.

To better understand attribution credit for a touchpoint, it is useful to explore the details of each model using the **Touchpoint Analysis** section.

1. Select a model from the **Apply the following attribution model** list to update the details in the **Touchpoint Analysis** section.
2. Select a touchpoint from the **Toucpoint Results** list to see which customer journeys include that touchpoint.

   Note: The Touchpoint Results section displays the touchpoints that were allocated the most credit for the conversion by the selected model.
3. Explore customer journey details and metrics.

Analyzing Customer Journeys

In the Customer Journey section, you can find details about the customer journeys for a selected touchpoint. For example, click a node in a customer journey to see information about that touchpoint and to access journey details such as the time period between touchpoints.

Note: A customer journey might display some times as identical even though the times are analytically different. This can happen when the difference in timing is too small to be rendered in a customer journey.

You can also select which metrics to display for each customer journey:

- **Count**: Displays the total number of times that the journey was identified, regardless of conversion.

  Note: A person might be associated more than once with the same journey. For example, if a person completes the same journey twice and converts after the second time, the system identifies this as two instances of a customer journey.

- **Percentage overall path**: Displays the percent of all conversions or non-conversions including this touchpoint for the data view that includes this customer journey. For example, **Conversion: 3%** means that 3% of all conversion paths including this touchpoint for the data view were for this customer journey.

- **Percentage within path**: Displays the percent of the current customer journeys that resulted in a conversion or non-conversion. For example, **Conversion: 3%** means that 3% of the customer journeys like this one resulted in a conversion.

- **Average elapsed time**: Displays the average time between the first and last touchpoints for all instances of this customer journey.

PART 9

Working with Segments

40

Overview of Segments

About Segments

A *segment* represents a group of people who share common characteristics such as age or gender. Here are examples of segments:

- females who are at least 40 years old
- households with at least four mobile phones

After you publish your segment or mark it ready, other items in SAS Customer Intelligence 360 can use the segment. For example, a published segment can be selected when you are defining the target audience of a task.

When you create a segment, you must select the data source for that segment. A segment can use only one data source.

- If you want to use data that was imported into or collected by SAS Customer Intelligence 360, choose the **Cloud Data Hub** option.
- If you want to use data that is stored in an on-premises data mart, choose **On-Premises Data mart**.

For information about creating segments, including detailed steps, see the following documentation:

- "About Cloud Segments" on page 474
- "About On-Premises Segments" on page 490

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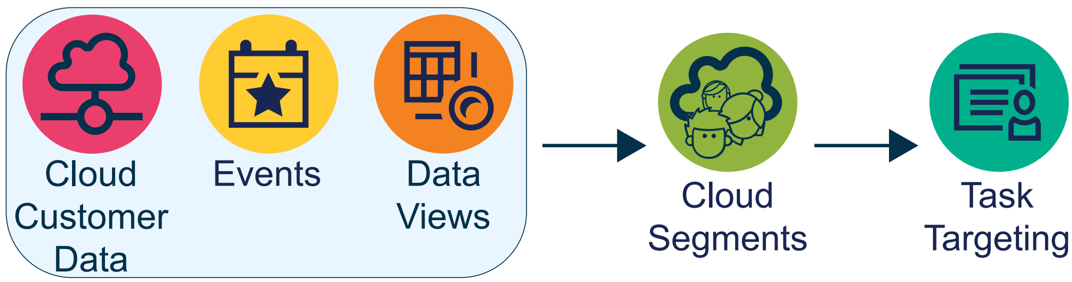
Working with Cloud Segments

Cloud segments use data that is available in SAS Customer Intelligence 360. For example, data that was imported or data collected from events can be used to create segments.

About Cloud Segments

Overview



Cloud segments are created using data that was either imported into SAS Customer Intelligence 360 or data that was collected by SAS Customer Intelligence 360. For example, cloud segments can access the following types of data:

- attribute-based information, such as data collected by creating events from the **Events** page.
- imported data.

A cloud segment contains the following items:

- the **Segment Map**. The segment map contains the criteria that define the characteristics of your segment.

  Note: Cloud segments do not support marking a node in the segment map as a segment. As a result, in cloud segments, the segment and the segment map refer to the same thing.

- Segment map properties, which are defined on the **Properties** tab. This is the information about your segment, such as the segment name and description. Some of these are required.

  Note: Cloud segments do not support adding a code to a segment node.

- A profile of the segment, and any other segment that you have selected to compare with the current segment. This information is available on the **Segment Profiles** tab.
- a status and list of all items that might be associated with the segment. This information is available on the **Orchestration** tab.

Note: No more than 50 segments can be active at once. If you have 50 active segments and you need to publish an additional segment, change the status of an existing active segment to Complete before publishing the new segment.

Segment Profiles

You can see information about the characteristics of a cloud segment by accessing segment profiles. You can use segment profiles to better understand the differences or similarities between different groups of people. There are two types of profiles.

- Segment profiles compare the members of the segment with everyone else. Segment profiles are automatically generated for segments.
- Segment comparison profiles compare members of two different segments. You select which segments to compare.

For example, suppose that you want to get more information about people who opt out of email notifications. First, you create a segment called Opt Out. You can now access the profile for Opt Out to see which characteristics differentiate the people who opt out of receiving emails from everyone else.

Next, you want to compare the characteristics of people who opt out of receiving emails with people who request to receive emails. If you create a segment for people who choose to receive emails, you can compare it to the Opt Out segment. Viewing the segment comparison profile for the two segments can help you discover which characteristics are similar or different among people who opt out of receiving emails and people who choose to receive emails.

About Segment Discovery

Introduction

When an A/B test recommends a winning variant, segment discovery searches for segments of the target audience that respond well or poorly to a variant that is different from the recommended winner. A segment represents a group of people who share common characteristics. Impression rates, conversion rates, and segment size are analyzed to compare the performance of the winning variant to the remaining variants in an A/B test. By looking for common attributes among customer data, SAS Customer Intelligence 360 can discover a segment and find an alternate variant that performs better for that segment than the winning variant. The discovered segment is displayed on the **Insights** tab.

In order to discover a segment, SAS Customer Intelligence 360 tracks customer information, including conversions. The completion of a conversion is counted only once per visitor. For example, each of these scenarios counts as one conversion:

- A visitor views the variant and completes the conversion. The same visitor then leaves the site and returns later, without completing the conversion.
- A visitor views the variant but does not complete the conversion. Later, the same visitor returns to the site and completes the conversion.
- A visitor views the variant and completes the conversion. The visitor leaves the site. The same visitor returns later and completes the conversion again.

SAS Customer Intelligence 360 takes all of the historic impressions and conversion rates into account when comparing a variant against the winning variant. These comparisons are used to display statistics on the confidence between competing variants. By default, the confidence threshold for identifying a discovered segment is 90%. The variant that performs better for a discovered segment than the overall winning variant is identified as the winner for that particular discovered segment.

Note: Optimized A/B tests do not generate discovered segments because the best-performing variant always gets the larger portion of the target audience. As a result, it is unlikely that the less-performing variants might include enough participants to be able to discover a segment.

Details about What Data Is Considered for Segment Discovery

Overview

Currently, only imported data, such as customer lists from SAS Marketing Automation or other sources, is used to discover segments. There is some data that is not analyzed when discovering segments. For example:

- a variable with too many missing values
- a character variable with too many possible values
- customer data that is discovered or collected by SAS Customer Intelligence 360, such as event attributes

Customer data is used for segmentation in these ways:

- Segment profiling is done on a per-data item basis.

  For example, assume that the structure of your customer data has columns for age and income. If a value for age is missing, the record is excluded from any calculations performed on age data. However, the record is still included in income calculations if an income value is present.
- Each data item from a descriptor is displayed as a criteria group for segments. These groups are identified when customer data is imported.

Import Settings for Segmentation

In order for customer data to be available when discovering segments, the data descriptor and segmentation properties must be set correctly before the data is imported into SAS Customer Intelligence 360. These settings are important when you want customer information (for example, gender) considered during segment discovery.

When the data is imported, these properties must be set in the data descriptor:

- segmentation must be set to `true`.
- excludeFromAnalytics must be set to `false`.
- segmentProfilingField must be set to `true`. This setting enables the user to be included on the **User-Defined Criteria** tab, which contains custom data items that you want to track.

- tag values must include `DEMOGRAPHICS` if you want to include the customer in segment profiling.

  If customer data is imported without this value, or customers visit your site anonymously, they can be used in a segment but cannot be part of segment profiling. For example, if your criteria are based on site activity, then the user could be part of the segment. However, the user is excluded from segment profiling for not having any demographic information.

  Users are included in all other analytics services, regardless of associated attribute data.

- For a customer to appear on the **Most Distinguishing Criteria** tab for a discovered segment profile, there must be at least one attribute defined for the customer in the imported table. If there are no attributes defined for the customer's record, the customer cannot be considered when the set of highest differential visitors is compiled.

For more information about these properties, see “Creating an Import Descriptor” on page 185.

Analytic Settings That Affect Segment Discovery

Navigate to **Configuration** ⇨ **General** ⇨ **Analytic Settings** to update these settings. The changes that you make to these settings affect every user on your site.

Minimum Threshold to Discover Segments

After 10,000 users participate in an A/B test, those participants are categorized into different groups, or bins. Each group is analyzed for discovered segments. The number that you specify here determines the size of each group. After a discovered segment is found, it is displayed on the **Insights** tab. By default, the **Minimum threshold to discover segments** field is set to 1,000.

Set the minimum threshold so thatSAS Customer Intelligence 360 discovers segments at a rate that you feel confident about. For example, if the minimum threshold is too low, the user interface displays many discovered segments, each made up of only a few members. As a result, you risk seeing evidence of segments that do not exist.

If the minimum threshold is too high, it can prevent discovered segments from being displayed. As a result, you might not see patterns that represent legitimate discovered segments.

Also consider the expected response rate for your A/B test. If you tend to get a high response rate from many participants, you can probably select a smaller number than if you expect a low response rate.

Try to set this threshold so that SAS Customer Intelligence 360 can discover three or four segments per test.

Note: This threshold sets the minimum threshold for all A/B tests.

Calculate Sample Size

An A/B test cannot recommend a winner until the sample size is met. Segment discovery does not look for segments until a variant is declared a winner. As a result, if your sample size is so large that it cannot be met, segments cannot be discovered.

In addition, SAS Customer Intelligence 360 does not search for discoverable segments until a segment reaches 10,000 members. As a result, a small sample size can prevent segments from being discovered.

Integrating with SAS Marketing Automation

You can import lists of known customers from SAS Marketing Automation. The lists are created from Cell nodes and Link nodes in campaigns. For information about configuring SAS Marketing Automation to share data with SAS Customer Intelligence 360, see *SAS Marketing Automation: User's Guide*.

If the **Make cell data available to SAS Customer Intelligence 360** option is selected on a Cell node or Link node, the imported list data that is provided to SAS Customer Intelligence 360 is refreshed when the campaign executes. The status of the imported list is Active.

If the **Make cell data available to SAS Customer Intelligence 360** option is deselected, or the cell or campaign has been deleted, the data is not refreshed. The status of the imported list is Static.

Note: For optimization of campaign groups in SAS Marketing Automation, cell data is not available unless node counts exist before optimization. Cell data is uploaded to SAS Customer Intelligence 360 during campaign execution. The data that is shared with SAS Customer Intelligence 360 consists of node counts before optimization. The optimized counts might be different. The optimized counts are not available to SAS Customer Intelligence 360.

Creating a Cloud Segment Map

About Segment Maps

Segment maps define the characteristics of a group of people. For example, you can create a segment map to group all women who own their own business. The characteristics that you want the segment to represent are added as nodes. There are three types of nodes in a cloud segment map:

- **Criteria** nodes contain characteristics that define a group of people.

- **And** nodes are used when you combine criteria nodes with an AND operator.
- **Or** nodes are used when you combine criteria nodes with an OR operator.

Create a Cloud Segment Map

> **TIP** If a segment already exists that contains some of the same criteria that you need to add to your new segment, you can start by making a copy of the existing segment. From **Segments**, select the segment that you want to copy and click ⋮ . Then select **Copy**.

Complete the following steps to create a segment:

1. From the navigation, select Segments.
2. Click .

   Note: The name of your segment cannot exceed 49 characters.
3. Select **Cloud Data Hub** to create a segment that uses customer information that was uploaded to SAS Customer Intelligence 360.
4. Add criteria, OR, and AND nodes to your segment map, then connect the nodes to create paths.

Next Steps

While you are working on your segment map, you can save your segment without updating its status. When you are finished adding nodes and connecting them to create paths, you can update the segment status so that the segment becomes active.

Adding Criteria Nodes to Cloud Segment Maps

When you are adding criteria to the nodes, you can use data and events to define who is included in the segment. In addition, you can use customer lists that have been imported from SAS Marketing Automation or other sources. For more information, see "Integrating with SAS Marketing Automation" on page 478.

Add Criteria Nodes

1 Click **Criteria** or drag the **Criteria node** onto the workspace.

2 Right-click the node and select **Open**.

> **TIP** You can double-click a node to open it.

3 Add a name and description to the node. The name is displayed on the node in the map view.

4 Add criteria to the node. For some criteria, you can choose whether to include or exclude the members that satisfy the criteria.

Note: All nodes must contain criteria before you can update segment counts or save the segment.

Add Events to Criteria Nodes

If you add an event to your criteria node, you can change the occurrence and time period of the event. The occurrence defines how often the event must occur so that a person is eligible for the segment. The time period defines when the event must occur in order to be eligible. By default, an event must occur at least once in the past week. To change the occurrence or time period of an event, click and set the event occurrence details.

Specify the number of times the event must occur in order for a person to be eligible. Set an operator and value for **Occurrences**. For example, you can set the **Occurrence** to **Less than (<)** 5. This setting is how you specify that an event must occur at most four times in order for a person to be eligible.

Set the time period in which all occurrences must occur:

- Select **Relative** to define a time period relative to the current day, such as within the past week.
- Select **Absolute** to define a time period with specific dates. For example, you can set the time period so that the event occurs at least one time before a specified date or between two specified dates.
- Select **None** when you do not need to define a time period for the event. Events that are added to a segment and do not have a defined time period are eligible anytime they occur.

For example, you want your segment to include customers who have visited your website's home page at least three times since January 1, 2016.

1 Define an event that detects and records a customer's view of your site's home page.

2 Create a segment or targeting in a task that uses that event as a criterion.

3 Set the occurrence and time period details for the event that detects a customer's view of the home page. Set **Occurrences** to **Greater than (>)** 2. Select **Absolute** for the date range, and set the time period to be greater than or equal to January 1, 2016.

Add AND and OR Nodes

Add AND and OR nodes to your segment map.

Select the Node Type

- Click or drag **And** to create a node that combines two criteria nodes using an AND operator.
- Click or drag **OR** to create a node that combines two criteria nodes using an OR operator.
- Connect nodes to create a path that represents your segment.

  Note: If a node is selected, you must deselect it before you can connect it to another node.

Set Node Properties

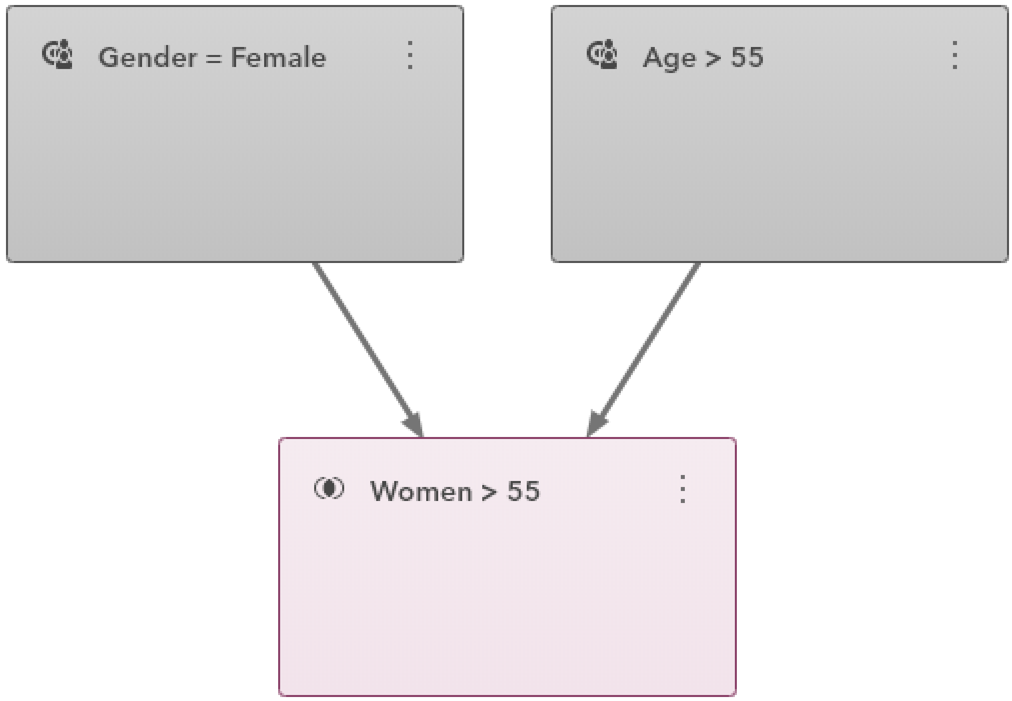
You can edit the properties of the node, such as the name and description. View the list of input nodes that lead to the AND node or the OR node, and change the rule that is used to evaluate potential segment candidates.

Note: The option that you select can result in different segments and impact performance.

AND Node Rule

You create a segment map that represents a household, and that map contains two criteria nodes. The first criteria node represents people who are female. The second criteria node represents people who are older than 55. You add an AND node to complete the segment map.

Figure 41.1 Segment Map Representing Women over the Age of 55



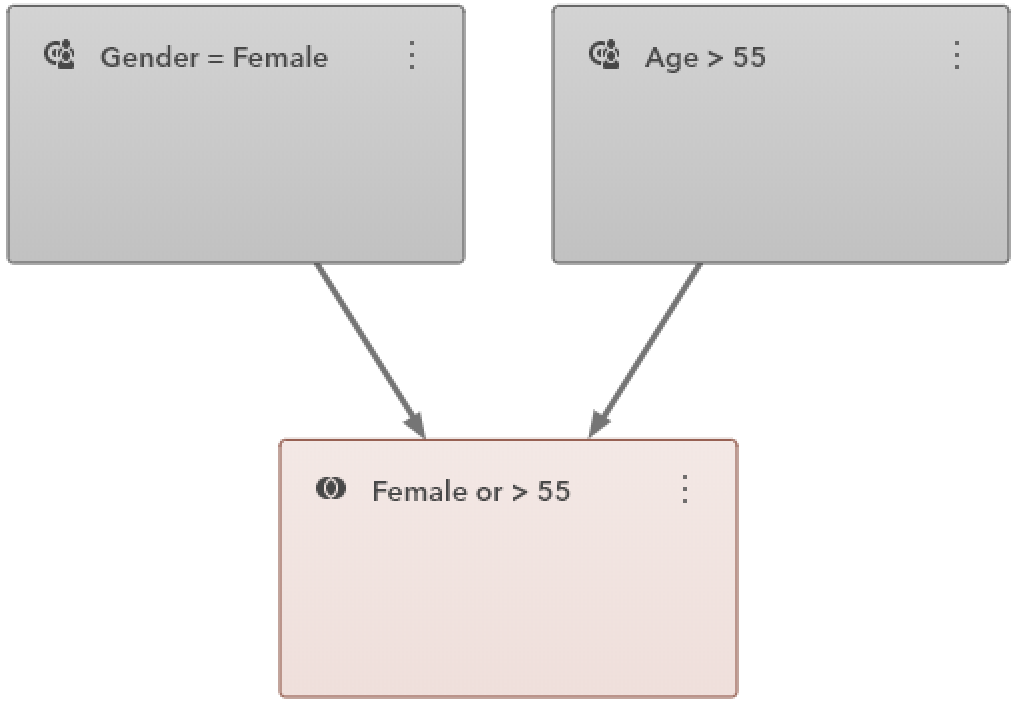
Here are the two options for the AND node rule:

- **Meets all conditions defined by input nodes.** This is the default option, and it works the same way that a logical AND works. In this case, your segment includes households that contain at least one person who is both female and older than 55.
- **Is a member of each group defined by input nodes.** This second option works like an SQL intersect command. In this case, a household is included in the segment if the household contains either of these conditions:
  - At least one person who is both female and older than 55. For example, a household that contains a 60-year-old woman satisfies the criteria.
  - At least one person who is female and at least one person who is older than 55. For example, a household that contains a 40-year-old woman and a 56-year-old man satisfies the criteria. So does a household that contains a 60-year-old woman.

OR Node Rule

You create a segment map that represents a household, and that map contains two criteria nodes. The first criteria node represents people who are female. The second criteria node represents people who are older than 55. This time, you add an OR node to complete the segment map.

Figure 41.2 Segment Map Representing People Who Are Women or over the Age of 55



Here are the two options for the OR node rule:

- **Meets any conditions defined by input nodes**. This is the default option, and it works the same way that a logical OR works. In this case, your segment includes households that contain either a person who is female or a person who is older than 55.
- **Is a member of any of the groups defined by input nodes**. This second option works like an SQL union command, which often results in the same segment. For the example, using this option, the resulting segment includes households that contain either a person who is female or a person who is older than 55. If you create a segment map that combines aggregate data, such as total household income, you can get different results depending on which option you select for the OR node.

  Note: When using aggregated data, the best practice is to select this option.

Managing the Segment Map

From the **Segment Map** tab, you can build and edit your segment nodes, change how you view the segment map, and update the node counts.

Understanding Node Status

The nodes in your segment map might include a status icon that provides the following information about that node.

Table 41.1 Segment Map Node Statuses

Status Icon	Description
No status icon (blank)	The node contains criteria, but the count is not calculated.
	The node is complete and contains a count. Note: This status is available only on the last node of the segment map.
	A node with this icon is incomplete. An example of an incomplete node is a node that does not contain criteria. For example, when you first add a node, it is incomplete until you open the node and add criteria to it. Note: While a node is incomplete, you cannot update the node counts on the segment map.
	The member count failed. You can choose to update the count on the segment map to try again.
	The member count is currently being calculated. Note: This status is available only on the last node of the segment map.

View Counts

A node count represents the number of people that satisfy the criteria listed in the node. Click to update the segment count on the last node of your map. To update counts, all nodes must contain criteria.

Note:

If your map contains a node that is not part of the segment map, the count is updated on any of the first nodes instead of the last node. To get a count on the last node, which represents the segment, remove any nodes that are not connected to the segment map.

You can reset the counts on all nodes at any time by clicking .

Navigate the Map

In addition to the icons that update counts, there are icons on the map workspace that you can use to navigate the map

- Click to move the map so that different parts of it are displayed.

- Click and to change how much detail is displayed on each node in the segment map.
- Click to display a navigation window for your map.

You can right-click the area around the nodes to see a complete set of actions that you can take on the map. The following additional options are available by right-clicking the map workspace:

- Select all nodes.
- **Zoom** to make the map larger or smaller.
- Select a different **Layout** to change the orientation of the map.
- Click **Find node** to quickly select a node in your map.

Work with Nodes and Paths

You can right-click a node or path to see a set of actions that you can take. For example, by right-clicking a node, you can select one of these actions:

- **Open** to display the properties of the node.
- **Add (Before)** and **Add (After)** to add nodes either as input or output nodes.
- **Remove** to delete the node.

  Note: You can also remove a node by selecting it and pressing the Delete key.
- **Copy (Ctrl+C)** and **Cut (Ctrl+X)**.
- **Show Summary** to show the summary of the targeting criteria for the node.

Add Properties to Your Cloud Segment

Properties are used to describe or identify your cloud segment. To update task properties, click the **Properties** tab and modify the available properties. The following properties are available for cloud segments:

- **Name**
- **Description**
- **Code**

Add a value to **Code** so that the cloud segment can be identified by its code when performing actions such as auditing and reporting. When an item is imported or migrated to SAS Customer Intelligence 360, the existing code value for the item is retained. Depending on the code settings for your environment, the code value might be editable. This value is not required to be unique to be valid. If the value is editable, you can change it to match the code value for another item. Valid characters for codes are alphanumeric characters, multi-byte characters, numerals, underscores, hyphens, and periods. Blank spaces are not allowed in code formats.

The **Code** field enables marketers to use a segment map to target customers based on their internal attributes (account type, balance, and so on) and their previous interactions. These codes are used to communicate information about the targeted customers to vendors or downstream systems. Using codes can minimize errors in text and punctuation that might occur when using an item name that is typically lengthy.

The information in the **Code** field can be used for operational reporting. The information can also be used to select or suppress customers for targeting messages (for example, a marketing message might target or exclude all customers who responded to direct marketing task *12345*).

Making Your Segment Available

Click the **Orchestration** tab and select **Mark Ready** or **Mark Ready and Publish** to make your segment available to a task. The status changes from Designing to either Ready or Active.

A Ready status indicates that the segment is ready to be published with a task. When a user publishes a task that uses a Ready segment, that user is prompted to confirm that the segment should be published along with the task. Segments with a Ready status can be changed back to a Designing status by clicking **Return to Designing**. Changing this status prevents segments from being published by a task.

To move a segment from a Ready status to an Active status, click **Publish**. Segments with an Active status cannot be changed back to Designing. An Active status does not prevent a task from publishing.

If the content of a published item is changed and saved, that item becomes out of sync with the published version. To synchronize the content, select **Republish**. Otherwise, the item stays out of sync with the published version and the updates are not delivered.

For more information, see “Republishing Out of Sync Items” on page 138.

When your segment is no longer needed, click **End**. The status changes to Complete. Any unsaved changes are lost.

View the Segment Profile and Compare Segments

When the system has enough data, a profile is created for your segment. The segment profile compares the members of the segment with the remaining members in your imported customer data. To access the profile, navigate to the **Segment Profiles** tab.

About the Segment Profile

The segment profile displays the attributes, or characteristics, that differentiate the segment. It contains two sections:

- The **Distinguishing Criteria** section displays the characteristics that most differentiate the members of this segment from everyone else. Characteristics found by the system and any customer data that you marked as available for analysis are included in this list.
- The **Criteria Marked for Analysis** section displays characteristics that were configured to always be displayed when the customer data was initially imported. These characteristics are displayed regardless of whether they differentiate the segment.

Note: Only the data that was configured to be available for segmentation and analysis when your customer data was imported into SAS Customer Intelligence 360 can be displayed in a segment profile. For more information about setting data descriptors for imported data, see Step 5 on page 188.

Comparing Segments

You can also compare the segment that you are viewing with other segments in the system. Comparing segments helps you see how the members of the segments differ. Comparing segments can also determine whether similar segments can be combined.

On the **Segment Profiles** tab, click **Add Segment** or **+** to add up to five segments that you are interested in comparing with the open segment. To refresh or delete a segment comparison, click ⋮.

Note: It can take several minutes for the segment profiles to be generated.

View Segment Usage Information

From the **Orchestration** ⇨ **Usage** tab, you can view which items use the segment and the items that the segment uses.

The ability to view dependencies between items enables you to see the items that a task depends on to work successfully. Usage information helps you identify how changes that you make to one item might affect another item.

Items That Use the Segment

The first section shows the items that use the segment. For example, if the segment is used in a task, the task is included in the list.

The Priority column displays the priority of like tasks that use the segment. Priority applies only to mobile spot, web spot, and mobile in-app message tasks because each of those task types might have two or more tasks that compete for the same resources. Other task types do not use prioritization.

For non-A/B test tasks, priority is on a scale of 1 through 5 (where 1 is the highest). The default is 3. An A/B test task has a priority of Test, which is higher than a non-A/B test task. An A/B test task always delivers its content.

You can change the priority of a non-A/B test task on the task's **Orchestration** ⇨ **Priority** tab.

Items That the Segment Uses

The second section shows items that the segment uses.

- Click **Directly Related** to list the items that the segment uses. For example, if a segment uses an event, the event is included in the list.
- Click **All Related** to view directly related items as well as any items that those directly related items use. For a segment, the list of directly related and all related items is the same.

  The list displays items with a Designing, Ready, or Active status. Click **Show Designing Status only** to display only items with a Designing status.

To open an item, click the item. To view item details and to open the item, click ⓘ in the item's row.

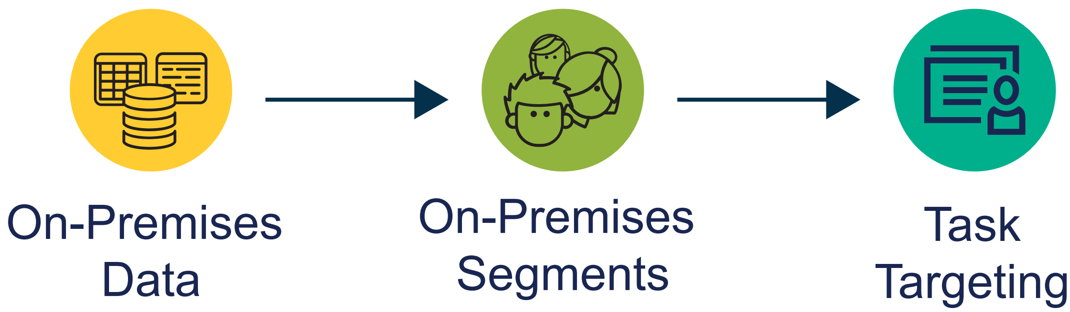
42

Working with On-Premises Segments

You can create segments that use your on-premises data to define the characteristics of a population.

About On-Premises Segments

Introduction



A *segment* represents a group of people who share common characteristics such as age or gender. For example, you might create a segment that includes females who are at least 40 years old. Depending on the type of license that you have, you can use data from your organization's data mart to create an on-premises segment. The segment that you create can include customer data as criteria. Active on-premises segments can be used in targeting for any task in SAS Customer Intelligence 360 when defining a target audience. The same segment can be used in different tasks. There are two ways that segments are created in SAS Customer Intelligence 360:

You can create a segment by adding and importing criteria to a segment map. The criteria that you add define who qualifies to be a member of the segment. A segment can contain different types of criteria from uploaded data. When you create a segment, potential members include members of subjects that have been identified for your data mart.

Identifying Data for On-Premises Segments

Administrators identify the data that is available to be used in on-premises segments by creating a single information map in SAS Information Map Studio.

An *information map* is a collection of data items that describe and present a view of physical data tables in a form that is relevant and meaningful to a business user. An information map does not contain any data. It is a map to the physical data. A SAS Customer Intelligence 360 information map describes the data sources that enable SAS Customer Intelligence 360 users to easily create on-premises segments. For example, instead of viewing a large collection of tables and columns, the business user views a simple list of business terms.

All information maps are stored in the SAS Metadata Repository in a folder that is designated as `ReportStudio/Maps`. On the **Folders** tab of SAS Management Console, SAS Customer Intelligence 360 information maps are typically stored in an

`Information Maps` subfolder. You can save an information map in any folder on the SAS server tier.

Note: SAS Customer Intelligence 360 does not support information map filters.

Creating On-Premises Segments

On-premises segments are created by building a segment map. Segment maps contain paths made up of nodes. Nodes process records for a subject, the hierarchical level to which selection criteria are applied. For example, a record can be selected because of household, customer, or account criteria. All three hierarchical levels are subjects. On the **Segment Map** tab, click to display the following types of nodes:

- **Criteria** nodes contain characteristics that define a group of people. The group of people defined by a node is the node's segment.
- **AND** nodes are used when you combine criteria nodes with an AND operator.
- **OR** nodes are used when you combine criteria nodes with an OR operator.
- **Split** nodes are used when you split incoming records into two or more cells. The **Split** node is preceded by an input node that provides a population to split.
- **Limit** nodes are used when you specify the settings that are used to create a subset of records.
- **Prioritize** nodes are used when you rank and de-duplicate the subjects of input nodes in order to create output nodes according to the priorities that you specify. The only nodes that cannot link to a **Prioritize** node are the **Export**, **Prioritize**, and **Split** nodes. You can use the **Prioritize** node to both de-duplicate and impose a limit. The result is that subjects that are excluded from one node are available for subsequent nodes in the prioritization.
- **Map** nodes are used when you change the record type of a selected group of customers in the segment map. For example, you can map information about the account to the customer in order to generate a list of customers.
- **Process** nodes enable you to write your own SAS code to analyze campaign data. You can also use the **Process** node to select and run stored processes. You can link a **Process** node to any node. The count for a **Process** node that generates cells is the count of the unique subject IDs that are distributed to its cells. When a **Process** node is the first node in the diagram and begins a selection, you must designate a subject. If a **Process** node is downstream from an **Export** node, you can use the **Process** node to create post-process operations. In this way, you can follow the execution of an export and test an export process.
- **Link** nodes are used to link to a **Criteria** node in a different segment map or to nodes that are generated by **Split** or **Prioritize** nodes in a different segment map. To link to nodes, select the **Mark node as linkable** check box in the source node.
- **Export** nodes create a file or table that contains information about the subjects of the preceding nodes. The subject is determined by the preceding nodes and the export definition. For example, you might have a **Map** node that maps customers to households and an export variable that has a unique value for customers,

such as the name. In this case, the **Export** node creates an export file that contains names based on the customers that came into the **Map** node.

Create a Segment That Uses On-Premises Data

Note: You cannot create a segment that uses on-premises data by copying an existing segment that uses on-premises data.

1 From the navigation bar, select Segments.

2 Click .

3 Click **On-Premises Data mart**.

Add a Criteria Node

When you are adding criteria to the nodes, you can use data to define who is included in the segment. In addition, you can use customer lists that have been imported from SAS Marketing Automation or other sources. For more information, see "Integrating with SAS Marketing Automation" on page 478.

1 Click or drag **Criteria** onto the workspace.

2 Right-click the node and select **Open**.

TIP You can double-click a node to open it.

3 Select a **Subject** from the list.

The subject determines the output for this node. For example, if you selected **Customer**, the output of this node would be individual customers. If you selected **Household**, the output of this node would be households.

If a subject is not supported as a segment by SAS Customer Intelligence 360, the **Mark node as segment** option is disabled for some node types. In some cases, a subject cannot be changed because it inherits the subject from a previous node in the segment map.

4 Enter information in the **Name** field. The name is displayed on the node in the map view.

5 (Optional) Enter information in the **Description** field.

6 Select **Mark node as segment** if you want to save the members of the node in your flow as a segment. Because the segment that is created from a node is associated with the larger segment flow, it inherits the status of that segment map. As a result, when you change the status of the segment map, the node segment status is updated automatically.

Note: You can access the node segment by navigating to the **Segments** tab and expanding the segment flow that contains it.

7 Select **Mark node as linkable** if you want to use this node as input to **Link** nodes in other segment maps. The segment map that contains the node must be published before you can use the node as input to a **Link** node.

Note: To ensure that the most recent subject results are used in the consumer segment map, enable the **Use the most current data when referenced by a link** option by selecting **Linking Information** ⇨ **Orchestration** for the segment map that contains the node.

8 Select **Always generate a count for this node** to generate a count if the count for the node is not produced when counts are updated. On subsequent runs of this segment map, the counts for this node are updated. By default, a count is not generated for a **Criteria** node when a count is updated for a downstream node. However, when you select this option, a count is generated for the **Criteria** node every time that a count is generated for a downstream node.

To specify that queries for this node are processed by downstream nodes separately from other nodes, select **Generate a population of subjects from this node that will be used by downstream nodes**. Typically, separate queries for nodes are combined for optimization purposes. When this option is enabled, the query for this node is processed separately and is used by any direct nodes that are downstream. Depending on your unique scenario, selecting this option might increase or decrease performance. Experiment with this option to determine the optimal results for your use case.

9 Add criteria to the node. For some criteria, you can choose whether to include or exclude the members that satisfy the criteria. On the **Data Items Rules** tab, perform the following actions:

- Click to view a summary of the criteria.
- Click to make a copy of the criteria.
- Click ⬆ or ⬇ to move criteria up or down in the list.
- Click to create a group for a set of criteria.
- Click ✚ to add criteria. In the **Select Criteria** window, select the criteria to add.

  You might want to select missing values for a data item to help define the targeting characteristics for a customer population. For example, you might want to target customers with a known age of less than 35 years old. To target this population, you can set criteria for `Exclude Age > 35` and `Exclude Age = missing`. To add missing values to other values for the criteria that you specify, click **Select missing values** on the **Specify Values** page. This option is affected when **Include selected values** or **Exclude selected values** is selected.

  Note: When you add a spot attribute that contains a URL query string parameter, the value of that parameter needs to be decoded for multi-byte character sets (MBCS). If you are adding a URL query string, the value should be encoded for MBCS.

  Note: If you select **Exclude selected values** on the **Specify Values** page for a criteria data item with a NULL value, counts for the node are not accurate because the command uses a WHERE clause in SQL that requires that the test be TRUE instead of FALSE or NULL.

10 On the **Aggregate Data Rules** tab, you can select aggregate data items and specify values to include in the **Criteria** node by performing the following actions:

Note: The criteria are determined by the rules that are specified on both the **Aggregate Data Rules** tab and the **Data Item Rules** tab.

- Click to view a summary of the criteria.
- Click to make a copy of the criteria.
- Click or to move criteria up or down in the list.
- Click to create a group for a set of criteria.
- Click to add criteria. In the **Select Criteria** window, select the criteria to add.

  You might want to select missing values for a data item to help define the targeting characteristics for a customer population. For example, you might want to target customers with a known age of less than 35 years old. To target this population, you can set criteria for `Exclude Age > 35` and `Exclude Age = missing`. To add missing values to other values for the criteria that you specify, click **Select missing values** on the **Specify Values** page. This option is affected when **Include selected values** or **Exclude selected values** is selected.

  Note: When you add a spot attribute that contains a URL query string parameter, the value of that parameter needs to be decoded for multi-byte character sets (MBCS). If you are adding a URL query string, the value should be encoded for MBCS.

  Note: If you select **Exclude selected values** on the **Specify Values** page for a criteria data item with a NULL value, counts for the node are not accurate because the command uses a WHERE clause in SQL that requires that the test be TRUE instead of FALSE or NULL.

11 Click **Done** to save updates to the node properties.

Note: All nodes must contain criteria before you can update segment counts or save the segment.

Add AND and OR Nodes

Add AND and OR nodes to your segment map.

Select the Node Type

- Click or drag **And** to create a node that combines two criteria nodes using an AND operator.
- Click or drag **OR** to create a node that combines two criteria nodes using an OR operator.
- Connect nodes to create a path that represents your segment.

  Note: If a node is selected, you must deselect it before you can connect it to another node.

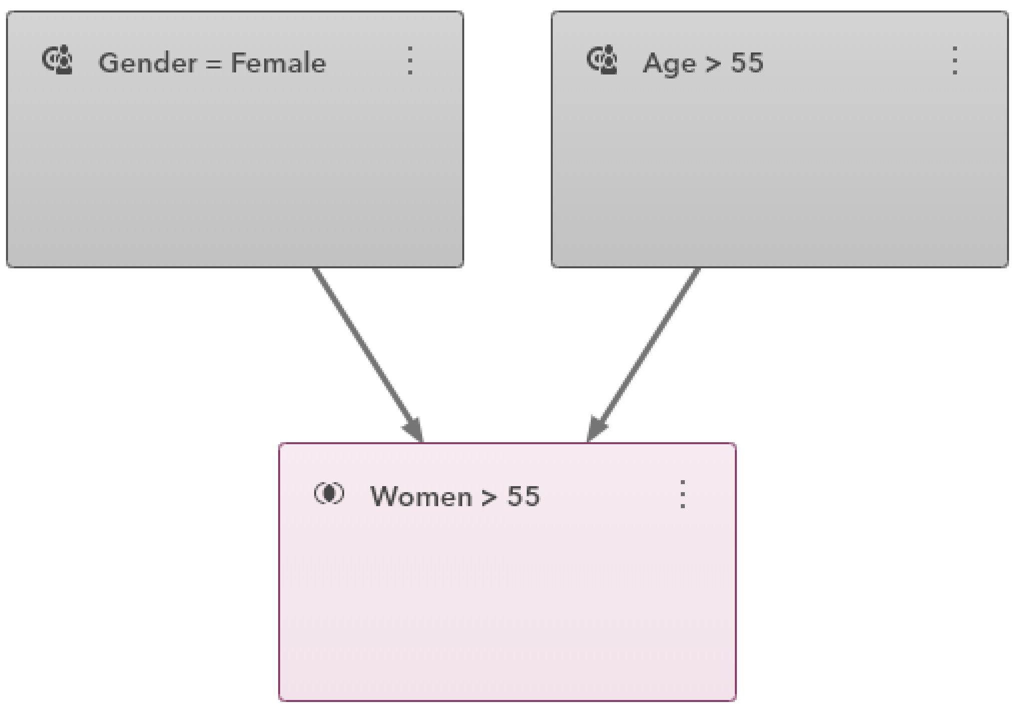
Set Node Properties

You can edit the properties of the node, such as the name and description. View the list of input nodes that lead to the **AND** node or the **OR** node and change the rule that is used to evaluate potential segment candidates. You can also mark the node as a segment, mark the node as linkable, or specify that a count is always generated for the node.

AND Node Rule

You create a segment map that represents a household, and that map contains two criteria nodes. The first criteria node represents people who are female. The second criteria node represents people who are older than 55. You add an AND node to complete the segment map.

Figure 42.1 *Segment Map Representing Women over the Age of 55*



Here are the two options for the AND node rule:

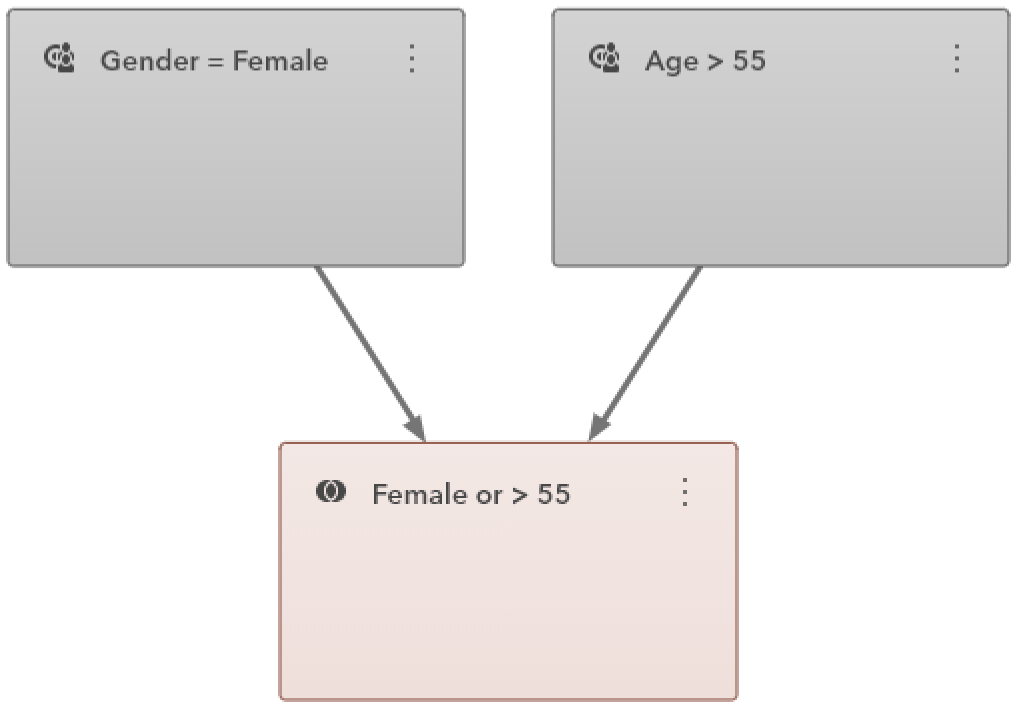
- **Meets all conditions defined by input nodes.** This is the default option, and it works the same way that a logical AND works. In this case, your segment includes households that contain at least one person who is both female and older than 55.
- **Is a member of each group defined by input nodes**. This second option works like an SQL intersect command. In this case, a household is included in the segment if the household contains either of these conditions:
  - At least one person who is both female and older than 55. For example, a household that contains a 60-year-old woman satisfies the criteria.
  - At least one person who is female and at least one person who is older than 55. For example, a household that contains a 40-year-old woman and a 56-

year-old man satisfies the criteria. So does a household that contains a 60-year-old woman.

OR Node Rule

You create a segment map that represents a household, and that map contains two criteria nodes. The first criteria node represents people who are female. The second criteria node represents people who are older than 55. This time, you add an OR node to complete the segment map.

Figure 42.2 Segment Map Representing People Who Are Women or over the Age of 55



Here are the two options for the OR node rule:

- **Meets any conditions defined by input nodes.** This is the default option, and it works the same way that a logical OR works. In this case, your segment includes households that contain either a person who is female or a person who is older than 55.
- **Is a member of any of the groups defined by input nodes.** This second option works like an SQL union command, which often results in the same segment. For the example, using this option, the resulting segment includes households that contain either a person who is female or a person who is older than 55. If you create a segment map that combines aggregate data, such as total household income, you can get different results depending on which option you select for the OR node.

  Note: When using aggregated data, the best practice is to select this option.

Mark the Node as a Segment

Select **Mark node as segment** if you want to save the members of the node in your flow as a segment. Because the segment that is created from a node is associated with the larger segment flow, it inherits the status of that segment map. As a result, when you change the status of the segment map, the node segment status is updated automatically.

Note: The option that you select can result in different segments and affect performance.

Mark the Node as Linkable

Select **Mark node as linkable** if you want to use this node as input to **Link** nodes in other segment maps. The segment map that contains the node must be published before you can use the node as input to a **Link** node.

Specify That a Count Is Always Generated

Select **Always generate a count for this node** to generate a count if the count for the node is not produced when counts are updated. On subsequent runs of this segment map, the counts for this node are updated. By default, a count is not generated for a **Criteria** node when a count is updated for a downstream node. However, when you select this option, a count is generated for the **Criteria** node every time that a count is generated for a downstream node.

To specify that queries for this node are processed by downstream nodes separately from other nodes, select **Generate a population of subjects from this node that will be used by downstream nodes.** Typically, separate queries for nodes are combined for optimization purposes. When this option is enabled, the query for this node is processed separately and is used by any direct nodes that are downstream. Depending on your unique scenario, selecting this option might increase or decrease performance. Experiment with this option to determine the optimal results for your use case.

Add a Split Node

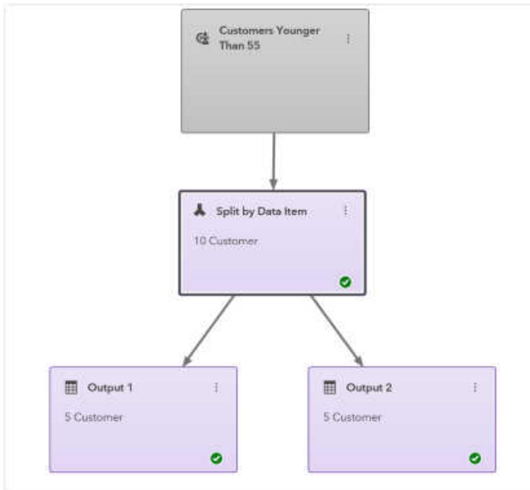
Add a **Split** node to continue building your segment map. Complete your segment map by connecting the nodes to create paths.

Click or drag **Split** to split incoming records into two or more nodes. The **Split** node is preceded by a **Criteria** node that provides a population to split.

Split Node Rule

You create a segment map that represents a customer population and add a **Split** node that splits the population in the **Criteria** node by values from a data item. The population can also be split by counts and percentage.

Figure 42.3 Segment Map Representing the Split of a Population of Customers Younger Than 55



Set Node Properties

You can edit the properties of the node, such as the name, description, and split method.

Create Splits by Using Values from a Data Item

To create splits by using values from a data item, select **Data Item** from the **Split method** list. On the **Outputs** tab, click and select the criteria to add. Next, specify the values for the criteria and click **OK**.

A subject might be listed more than once in a database. For example, a customer might have more than one account. To restrict the number of cells that list a subject and limit the number of times that the subject is counted, move the slider to the On position for **Restrict number of output cells subjects appear in**, and then specify a number.

Enter label information for the output node in the **Output Name** field.

To add another output node for the split, click +, click in the Data Item Value column for the output node, and then enter label information for the output node in the **Output Name** field.

You might want to select missing values for a data item to help define the targeting characteristics for a customer population. For example, you might want to target customers with a known age of less than 35 years old. To target this population, you can set criteria for `Exclude Age > 35` and `Exclude Age = missing`. To add missing values to other values for the criteria that you specify, click **Select missing values** on the **Specify Values** page. This option is affected when **Include selected values** or **Exclude selected values** is selected.

To move output nodes up or down, select the row for the nodes and click ▲ or ▼. To remove output nodes, select the row for the nodes and click .

To combine the values for multiple output nodes, select the check boxes in the rows for the nodes and click **Combine Output**. Next, enter information in the **Name** field in the **Combine Output** window.

Click **Done** to save updates to the node properties.

Note: To create a **Split** output node that contains multiple output values, enter the same information in the **Name** field in the rows for multiple nodes. appears in the rows for output values that have the same name.

Create Splits by Using Counts

To create splits by using counts, select **Counts** from the **Split method** list. On the **Outputs** tab, click **Add Output** to create an output node. In the row for each output node that you create, enter the actual count of the segment that you want to assign in the **Requested Count** field and enter information in the **Output Name** field.

To move output nodes up or down, select the row for the nodes and click ▲ or ▼. To remove output nodes, select the row for the nodes and click .

The order in which each output node is filled is based on the sort option that you specify on the **Sort** tab.

To combine the values for multiple output nodes, select the check boxes in the rows for the nodes and click **Combine Output**. Next, enter information in the **Name** field in the **Combine Output** window.

Click **Done** to save updates to the node properties.

Create Splits by Using Percentages

To create splits by using percentages, select **Percentages** from the **Split method** list. On the **Outputs** tab, click **Add Output** to create an output node. In the row for each output node that you create, enter the percentage of the segment that you want to assign in the **Requested %** field and enter information in the **Output Name** field. You can enter a value of less than 1%. You can click **Quick Split** to specify four equal nodes or 10 equal nodes. You can alter the percentages in the **Requested %** field for the nodes that are created when you click **Quick Split**.

To move output nodes up or down, select the row for the nodes and click ▲ or ▼. To remove output nodes, select the row for the nodes and click .

The order in which each output node is filled is based on the sort option that you specify on the **Sort** tab.

To combine the values for multiple output nodes, select the check boxes in the rows for the nodes and click **Combine Output**. Next, enter information in the **Name** field in the **Combine Output** window.

Click **Done** to save updates to the node properties.

Modifying a Split Output Node

To modify a **Split** output node, open the node to make desired changes to the **Name** and **Description** fields or to change the **Mark node as linkable** and **Mark node as segment** selections.

Add a Limit Node

Add a **Limit** node to continue building your segment map. Complete your segment map by connecting the nodes to create paths.

Click or drag **Limit** to specify the settings that are used to create a subset of records.

Requirements for a Limit Node

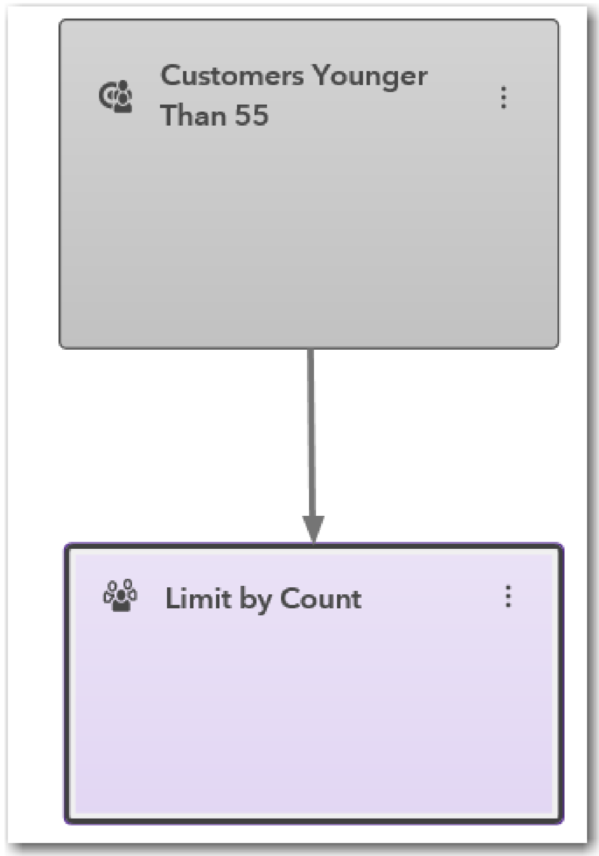
Before counts for a **Limit** node can be updated, the node must meet the following requirements:

- At least one input node is connected to the **Limit** node.
- All required upstream nodes are connected to the **Limit** node.
- Upstream nodes that are connected to the **Limit** node contain all required information.

Limit Node Rule

You create a segment map that represents a customer population, and then create a subset of that population that can be targeted for marketing.

Figure 42.4 Segment Map Creating Limits for Customers Younger Than 55



Set Node Properties

You can select the method for splitting the population into subsets.

Enter information in the **Name** and **Description** fields.

To specify a count limit for the subset, select **Count** from the **Limit using** list, and then enter a value in the **Requested** field. To specify a percentage limit for the subset, select **Percentage** from the **Limit using** list and enter a value in the **Requested** field.

The order in which each output node is filled is based on the sort option that you specify on the **Sort** tab.

Click **Done** to save updates to the node properties.

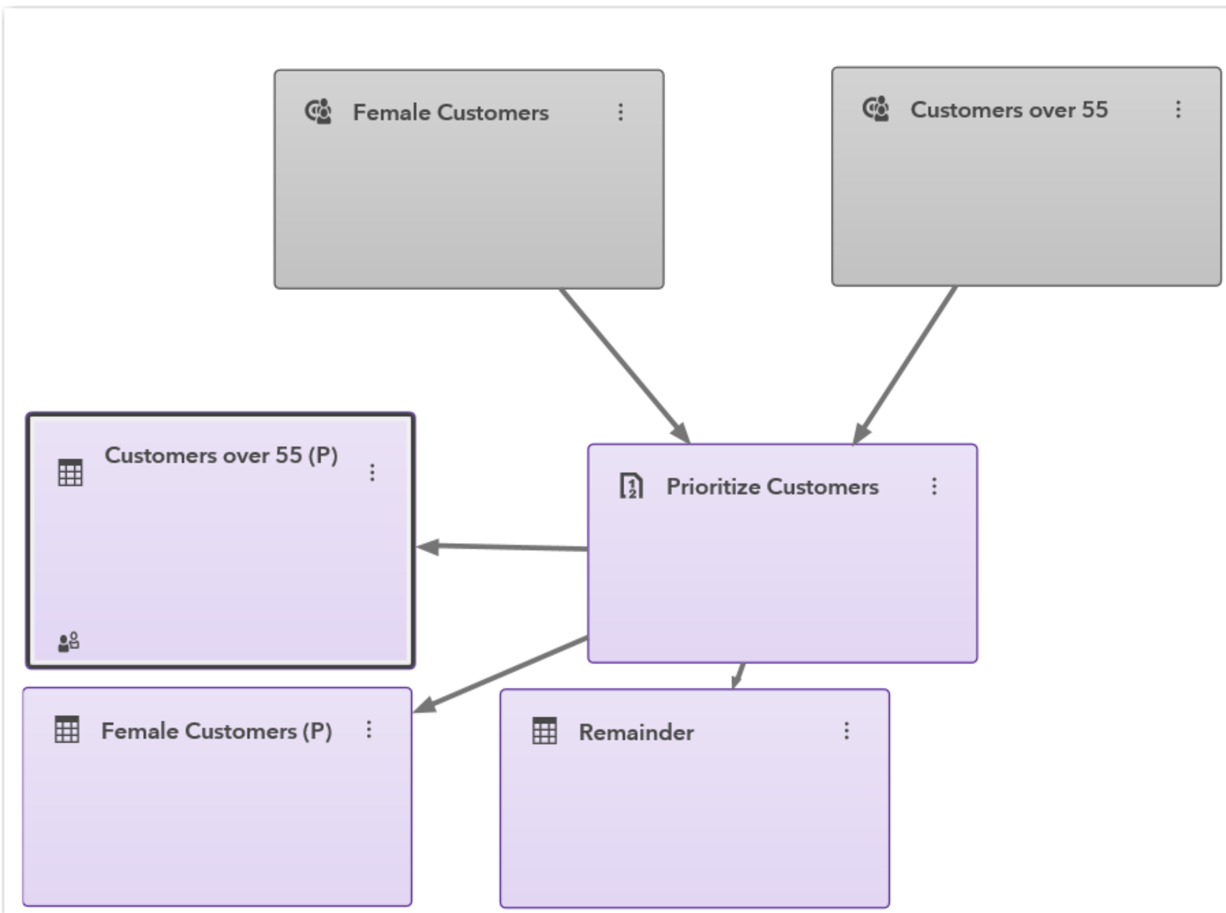
Add a Prioritize Node

Add a **Prioritize** node to continue building your segment map. Complete your segment map by connecting the nodes to create paths. Click or drag **Prioritize** to create a node that specifies the priorities for two or more Criteria nodes that are used to create output cells. You must connect the **Prioritize** node to an input node with a selected subject.

Prioritize Node Rule

You create a segment map that represents a customer, and that map contains two criteria nodes. The first criteria node represents customers who are female. The second criteria node represents customers who are older than 55. You add a **Prioritize** node to complete the segment map.

Figure 42.5 Segment Map Prioritizing Output for Customers Who Are Women or over the Age of 55



Set Node Properties

You can edit the properties of the node, such as the name, description, prioritization, output name, output limit, and sort order.

Enter information in the **Name** and **Description** fields.

If you do not want to use the default names for the output node, you can modify the **Output Name** field in the row for each output node. To modify the priority order for an output node, select the row for the node and click ▲ or ▼. To remove an output node from the prioritization, select the row for the node and click 🗑.

Click in the Output Limit cell and specify a limit for every output node on the **Limit** tab. You can limit the number of subjects based on a count or percentage. The order in which each output node is filled is based on the sort option that you specify on the **Sort** tab. If a sort is not specified, the default sort is used on this **Prioritize** node.

Note: You can also specify a sort order on the **Default Sort Order** tab in the Properties window. The first sort order that you specify is the primary sort order. To add a sort order, click +. To delete a sort order, click .

If you do not specify a limit, the sort criteria do not take effect. This setting overrides the setting in the **Sort** field. The value in the Output Count cell is the number of unique subject IDs that are assigned to an output cell. The **Prioritize** node de-duplicates the input cells. The count of the output cell might decrease for those cells that are prioritized greater than 1, depending on the count for the higher priority cells.

To mark or unmark an output node as a segment, click in the Segment column for the node. To mark or unmark an output node as linkable, click in the Segment column for the node.

Click **Remainder** to create records that do not belong in any other output cell after limits and de-duplication have been applied. The remainder is calculated when you click .

In the output node, click **Mark node as segment** to enable the node to be used as a segment in another segment map. This option affects cells that are generated after the option is selected. **Mark node as segment** can be selected or cleared in the generated output node without affecting whether the option is selected in the **Prioritize** node.

To mark or unmark an output node as linkable, click **Mark node as linkable**.

Click **Done** to save updates to the node properties.

Add a Map Node

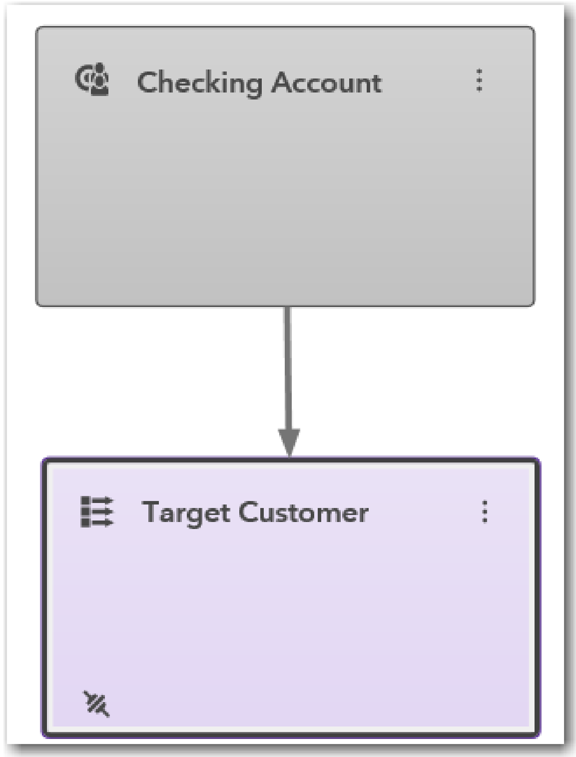
Add a **Map** node to continue building your segment map. Complete your segment map by connecting the nodes to create paths.

Click or drag **Map** to create a node that changes the record type of a selected group of customers in your diagram. The **Map** node enables you to obtain a count for a subject that is different from the criteria node that the **Map** node is connected to.

Map Node Rule

You create a segment map that maps information about the account to the customer in order to generate a list of customers.

Figure 42.6 Segment Map Mapping a Checking Account to a Customer



Set Node Properties

Enter information in the **Name** and **Description** fields.

To enable the node to be used as a segment in another segment map, select **Mark node as segment**.

If you selected **Mark node as segment**, you can also enter a value or modify an existing value in the **Code** field to identify the object for activities such as auditing and reporting. When an object is imported or migrated to SAS Customer Intelligence 360, the existing code value for the object is retained. Depending on the code settings for your environment, the code value might be editable. This value is not required to be unique to be valid. If the value is editable, you can change it to match the code value for another item. The **Code** field must always include a value. Valid characters for codes are alphanumeric characters, multi-byte characters, numerals, underscores, hyphens, and periods. Blank spaces are not allowed in code formats.

Note: When you copy and paste a node in a segment map, new codes are created for the new nodes if SAS Customer Intelligence 360 is configured to use the Automatic Editable or Automatic Not-Editable code settings. IfSAS Customer Intelligence 360 is configured to use the Manual code setting, the new node will have the same code as the source node. For more information, see "Specifying Code Settings" on page 101.

Click **Mark node as linkable** to enable this node to be used as input to **Link** nodes in other segment maps.

Select a target subject from the **To subject** list. The selection for the **To subject** field determines the output for this node. For example, if you select **Customer**, the output of this node is individual customers. If you select **Household**, the output of this node is households. Some subjects might not be mapped to other subjects. In some cases, a subject cannot be changed because it inherits the subject from another node in the segment map.

To refine the output by referencing existing nodes from the segment map, move the slider to the On position for **Restrict population by node selection**, and then select nodes to use for the restriction criteria. You can use this option to specify mapping rules, limit the number of output records, and specify data items to use in sorting records. This option is available when the **From subject** field and **To subject** field have a one-to-many or many-to-many relationship.

Select a **Refinement rule** from the list to specify a rule to apply to the subjects from the input node.

To refine the criteria for the output node that is generated by the **Map** node, move the slider to the On position for **Refine population by criteria**, and then select the criteria.

The order in which each output node is filled is based on the sort option that you specify on the **Sort** tab. If a sort is not specified, the default sort is used on the output node.

On the **Options** tab, you can limit the number of output records and specify the rule to apply to the subjects from the input node.

Note: To ensure that the most recent subject results are used in the consumer segment map, enable the **Use the most current data when referenced by a link** option by selecting **Linking Information** ⇨ **Orchestration** for the segment map that contains the node.

Click **Done** to save updates to the node properties.

Add a Process Node

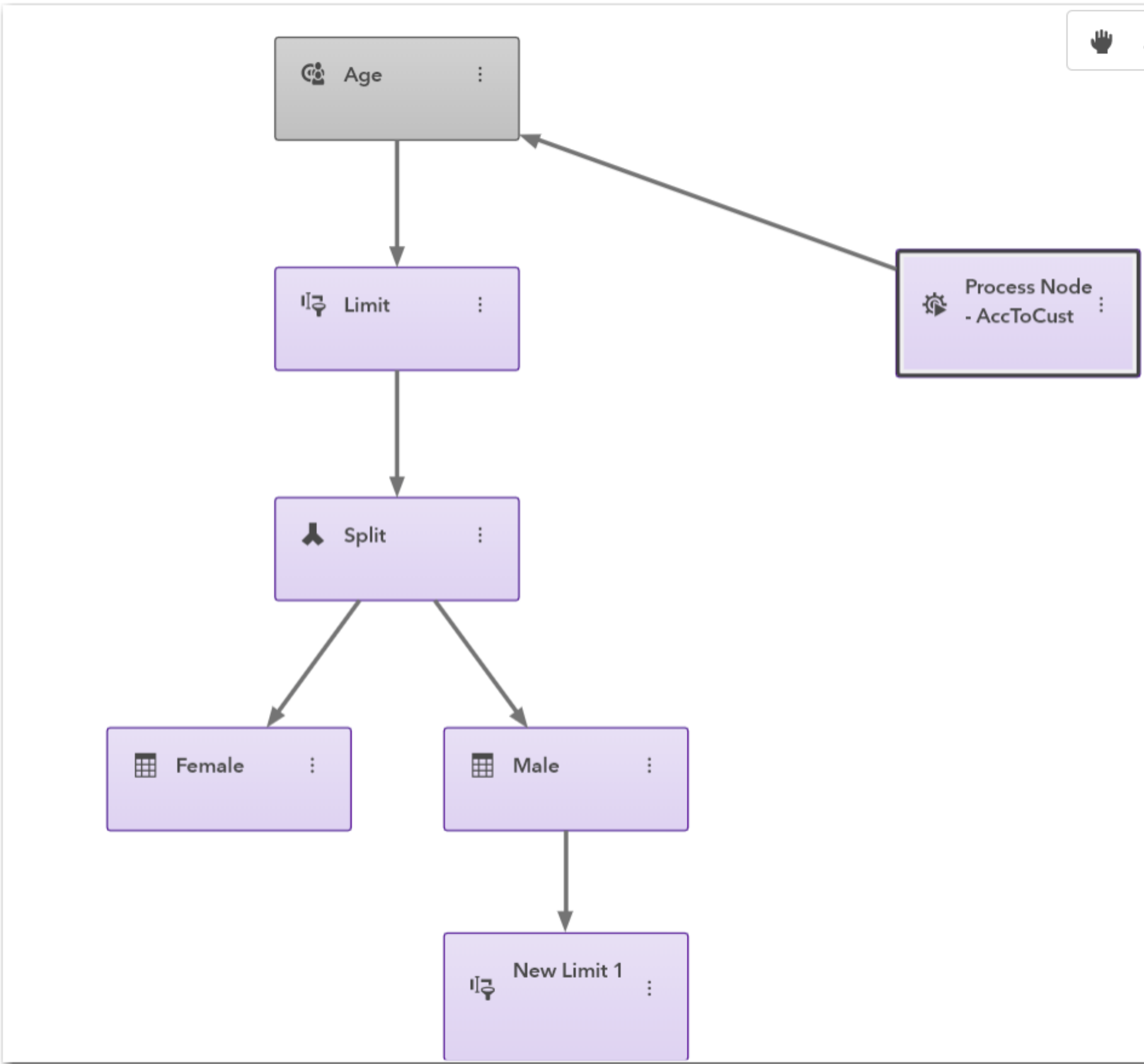
Add a **Process** node to continue building your segment map. Complete your segment map by connecting the nodes to create paths.

Click or drag **Process** to write your own SAS code to analyze campaign data or to select and run stored processes.

Process Node Rule

The counts for a **Process** node that generates cells are the unique subject IDs that are distributed to its cells. If a **Process** node is downstream from an **Export** node, you can use the **Process** node to create post-process operations. In this way, you can follow the execution of an export and test an export process.

Figure 42.7 Process Node



Set Node Properties

Enter information in the **Name** and **Description** fields.

Click and select a process that has been defined. To remove an existing process from the node, click **Clear selection**.

You set the parameters for a stored process when you select it.

Depending on the stored process, you might be able to select input or output subjects for a newly created node that is not connected to other nodes. Select subjects from the **Input subject** and **Output subject** lists. If the subjects do not match the subjects of nodes that are linked to the **Process** node, the links might be broken. The input subjects and output subjects for a stored process are specified during the creation of the stored process. If no input and output subjects have been specified, all subjects are available for selection.

If the stored process contains parameters, set the required parameter values on the **Parameters** tab. In the stored process, you can specify relative dates such as Today or Tomorrow. The stored process supplies missing values for optional parameters if you do not enter a parameter value.

On the **Output** tab, you can change the name and number of output nodes that are generated by a stored process, create a new output node, mark or unmark output nodes as segments, and mark or unmark output nodes as linkable.

Note: Some stored processes do not generate output nodes.

All output cells have the same subject ID. You can change the names of the output cells. The default name of each generated output cell is `Output` *n*, where *n* is a number in a sequence. For example, a **Process** node generates output cells that are named Output 1 and Output 2. The next **Process** node in the diagram generates output cells that are named Output 3 and Output 4.

The default number of output cells that are generated is set by the **`NumberofCells`** keyword in the stored process. The **`MinCells`** and **`MaxCells`** keywords specify the minimum and maximum number of cells. The **`NumberofCells`** keyword does not have to be specified.

If the **`MaxCells`** value is specified, and **`MinCells`** and **`NumberofCells`** values are not specified, the minimum number of rows is 1. If only the **`MinCells`** value is specified, the maximum number of rows is unlimited.

Select a row and click the arrows to change the order of output cells. Select **Make output cells available for linking** to link to these cells from the **Link** node. This option affects cells that are generated after the option is selected. **Make output cells available for linking** can be manually selected or cleared in the generated cells without affecting whether the option is selected in the **Process** node.

To create an output node for the stored process, click and enter information in the field in the Output Name column.

To mark or unmark an output node as a segment, click in the row for the node and enter the desired information in the **Code** field. To mark or unmark an output node as linkable, click in the row for the node.

The **Input Nodes** tab displays the nodes that contribute to the **Process** node. Select a row and click the arrows to change the order of input nodes that are submitted to the process.

To understand how the SAS code is working, click the **Log** tab to display logging messages.

You can use the contents of the **Log** tab to debug any errors that appear. The segment map name and **Process** node name are displayed at the top of the log. To copy a log so that you can paste it into an email message or another application, right-click the selected text and select **Copy**.

Here are the log statuses:

Not available
: means that the **Process** node has not been executed or that the logs have been cleared.

Current
: means that the log is from the most recent time that the **Process** node was executed, and that no changes have been made to the process. The log text is grayed-out.

Outdated
: means that changes have been made to the code since the last time the **Process** node was executed.

Click to clear the contents of the log.

Click **Done** to save updates to the node properties.

Add a Link Node

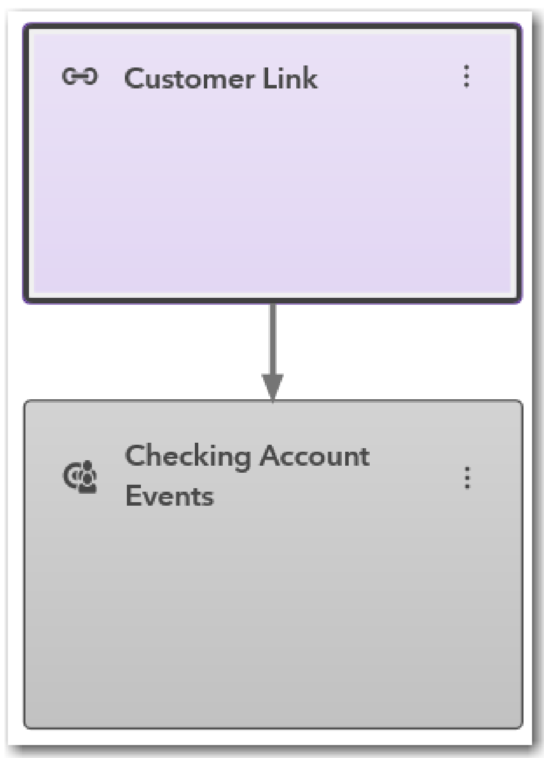
Add a **Link** node to continue building your segment map. Complete your segment map by connecting the nodes to create paths.

Click or drag **Link** to link a node in a different segment map or to output nodes that are generated by the **Split** or **Prioritize** node in a different campaign.

Link Node Rule

You create a segment map that links a node to another node.

Figure 42.8 Segment Map Link Node Connecting a Source Subject to a Node



Set Node Properties

You can edit the properties of the node, such as the name, description, source node to be linked to, and subject exclusions.

Enter information in the **Name** and **Description** fields.

Click and select a linkable source node from a segment map.

Select the **Exclude these subjects** check box to exclude the selected subjects from the population.

Click **Done** to save updates to the node properties.

Note: If the values have changed in the segment map that you have linked to, you must close and reopen the current segment map in order to display the changed values.

Add an Export Node

Add an **Export** node to continue building your segment map. Complete your segment map by connecting the nodes to create paths.

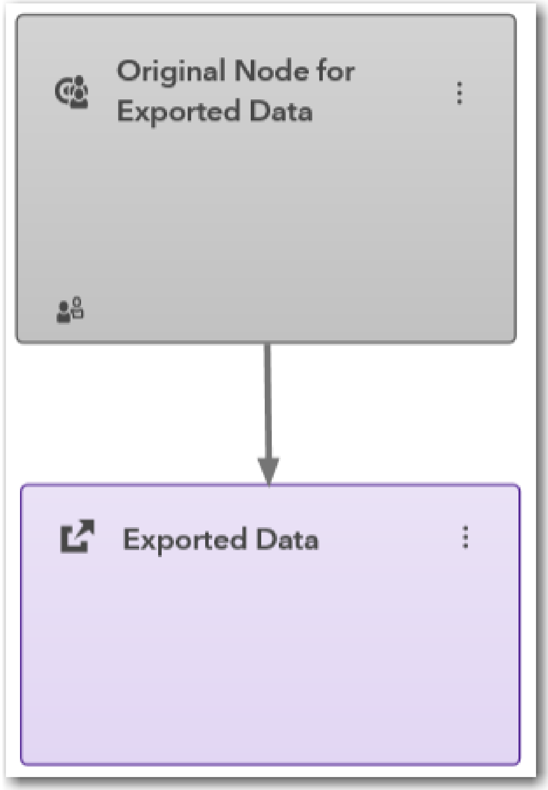
Click or drag **Export** to create a file or table that contains information about the subjects of the preceding nodes.

The counts for an **Export** node reflect the number of unique subjects, not the number of records, to be exported. Before its counts can be updated, an **Export** node must meet the following requirements:

- At least one input node is connected to the **Export** node. You can connect multiple input nodes through an **And** node.
- A subject has been defined for each input node.
- There are no input nodes that have a Designing status.
- At least one export field is selected.

Export Node Rule

You create a segment map that uses an **Export** node to create data for a node that is connected to the **Export** node.



Set Node Properties

You can edit the properties of the node, such as the name, description, export template, and the fields that will be included in the exported table.

Enter information in the **Name** and **Description** fields.

Click and select a template that contains predefined export data.

To build the export table that is produced by the **Export** node:

1 Click **Edit** on the **Export Table** tab.

2 On the **Properties** tab, complete the following actions:

- Select **Comma separated values (.csv)**, **SAS data set**, or **Table** from the **Output type** list.
- Enter information in the **Export name** field. To use variable tags for the export name, click . For more information, see “Use Variables to Create Export File Names” on page 532.

  Note: If you are creating a .csv file, enter a name for the export file using alphanumeric or double-byte characters. The character limit is dependent on your operating system. The export name must begin with a letter or an underscore.

  If you are creating a SAS data set, enter a name for the export file using alphanumeric characters (A–Z, a–z, 0–9), %, and underscores. You can enter up to 32 characters. The export name must begin with an alphanumeric character or an underscore.

If you are creating a table, enter a name for the export file using alphanumeric or double-byte characters. (Only these special characters are allowed: &, %, and periods.) You can enter up to 32 characters. The export name must begin with a letter or an underscore.

- In the **Export location** field, specify a default export location for the new export table.
- (Optional) Select **Include header row** to add a header row to the export template so that the exported data displays the output name for every export field.
- (Optional) Select **Discard rows with duplicate subject IDs per input node** to exclude duplicate subject IDs from the export file. In the case of a single node where a field being exported has a many-to-one relationship with the subject ID of the node, duplicates are excluded. For example, duplicate subject IDs are excluded when the subject ID is “Customer,” and a single customer has multiple accounts.

3 On the **Export Selection** tab, click **Add Fields**.

4 In the Select Criteria window, select one or more fields in the Select Criteria window and click **OK**.

To add more fields, select and select one or more fields in the **Select Criteria** window.

To delete existing export fields, select the check box in the row for an export field and click

5 Enter information in the Output Name column for each export field.

Note: The name of the export output file must be unique.

6 (Optional) In the Format column for an export field, use the standard SAS format to specify the formatting of your data. (For example, you can specify a currency format or a date format.) For information about formatting, see *SAS Formats and Informats: Reference*.

7 If you want to replace the new export table with a predefined table, click in the **Export Field** column and then select a table.

8 On the **Sorting Options** tab, click **Add Sort Order** to specify whether the columns are sorted in ascending or descending order. Click to create an additional sort order.

Note: The **Add Sort Order** button is not available if no export fields have been created.

9 To refine your data so that extra output records are not included, follow the instructions in “Refining Output for a Node” on page 520.

10 Click **Done**.

Manage the Segment Map

From the **Segment Map** tab, you can build and edit your segment nodes, change how you view the segment map, and update the node counts.

Understanding Node Status

The nodes in your segment map might include a status icon that provides the following information about that node.

Table 42.1 Segment Map Node Statuses

Status Icon	Description
No status icon (blank)	The node contains criteria, but the count is not calculated.
	The node is complete and contains a count.
	A node with this icon is incomplete. An example of an incomplete node is a node that does not contain criteria. For example, when you first add a node, it is incomplete until you open the node and add criteria to it. Note: While a node is incomplete, you cannot update the node counts on the segment map.
	The member count failed. You can choose to update the count on the segment map to try again.
	The member count is currently being calculated.

View Counts

A node count represents the number of people who satisfy the criteria listed in the node. Click to update the segment count on all of the nodes of your map. To update counts, all nodes must contain criteria.

To update the count for a single node, open the node and click .

To obtain a partial update of counts in a segment map:

1 Update the criteria for a node in the map and save your changes. The existing count for the node is cleared.

2 Select the updated node.

3 Click .

Counts are updated in the selected node and in any nodes that are downstream from the node. The counts for upstream nodes are not changed.

Note:

If your map contains a node that is not part of the segment map, the count is updated on any of the first nodes instead of the last node. To get a count on the last node, which represents the segment, remove any nodes that are not connected to the segment map.

You can reset the counts on all nodes at any time by clicking .

Opening a Segment Map That Is Running Counts

If you open a segment map that is in the process of running node counts, you can modify only the portions of the segment map that are not running counts. To allow counts in the segment map to continue running until completion, click **Continue Counts**. To abandon counts in the segment map that is still running, click **Abandon Counts**.

Navigate the Map

In addition to the icons that update counts, there are icons on the map workspace that you can use to navigate the map

- Click to move the map so that different parts of it are displayed.
- Click and to change how much detail is displayed on each node in the segment map.
- Click to display a navigation window for your map.

You can right-click the area around the nodes to see a complete set of actions that you can take on the map. The following additional options are available by right-clicking the map workspace:

- Select all nodes.
- **Zoom** to make the map larger or smaller.
- Select a different **Layout** to change the orientation of the map.
- Click **Find node** to quickly select a node in your map.

Work with Nodes and Paths

You can right-click a node or path to see a set of actions that you can take. For example, by right-clicking a node, you can select one of these actions:

Note: Some actions might not be available for a selected node.

- **Open** to display the properties of the node.
- **Update counts** to reset the counts for the node.
- **Add (Before)** and **Add (After)** to add nodes either as input or output nodes.
- **Add (Before)** and **Add (After)** to add nodes either as input or output nodes.
- **Combine output** to combine the output for **Split** nodes after pressing the Ctrl key while clicking each node. To undo the creation of a **Split** node with combined output, right-click the **Split** node and select **Separate output**.

- **Copy (Ctrl+C)** and **Cut (Ctrl+X)**. For more information, see “Copying and Pasting Nodes” on page 514.
- **Show summary** to show the summary of the targeting criteria for the node.
- **Mark node as segment** to save the members of the node as a segment. Because the segment that is created from a node is associated with the larger segment flow, the segment inherits the status of that segment map. As a result, when you change the status of the segment map, the node segment status is updated automatically. The segment appears on the **Segments** tab in the segment map and in the table on the **Segment Maps and Segments** page.
- **Unmark node as segment** to undo the **Mark node as segment** action.
- **Mark node as linkable** to enable the node to link to other segments.
- **Unmark node as linkable** to undo the **Mark node as linkable** action.

Copying and Pasting Nodes

The following considerations apply when you copy and paste nodes.

All nodes

When a pasted node references a variable and the source of the variable is not copied, the node status is Incomplete ( ).

AND node

If an **AND** node is copied and the upstream nodes are not included, the subject is undefined and no items appear in the Input Nodes table in the pasted node.

Export node

- You cannot change the export definition or the contents of the export file in an **Export** node that is pasted by itself. This restriction does not apply to an **Export** node that is pasted with upstream nodes.
- Any export items that do not exist in the target segment map, such as custom details, are removed from the pasted **Export** node.
- Refine output specifications are retained. If you are pasting the **Export** node into a segment map, the node reference is retained only if the **Export** node, refine output references, and all of the intervening nodes necessary to make the refine output reference valid are copied and pasted at the same time. If the **Export** node is pasted into the same segment map and the node that is the source for refine output is a terminal node and is included in the copy, the refine output reference is to the pasted node. If the terminal refine output node is not part of the copied set of nodes, the reference is to the original refine output node.

Limit node

- The **Incoming** and **Actual** fields are blank in the pasted node.
- You cannot select a data item on the **Sort** tab if the pasted node is not connected to an input node with a selected subject.

Link node

If a node is assigned to a **Link** node and the **Link** node is pasted into the segment map from which the node originates, the **Link** node is cleared. The **Link** node is set to an Incomplete state.

Map node

If the **Map** node is pasted without a connecting node upstream, the **From subject** is set to Undefined. Only a node with a subject that is compatible with the **To subject** can be connected to the **Map** node as an input node.

OR node

If an **OR** node is copied and the upstream nodes are not included, the subject is undefined and no items appear in the Input Nodes table in the pasted node.

Prioritize node

- Generated nodes are pasted only if the relevant input nodes are included in the copy.
- Output nodes cannot be copied by themselves; they must be included in a copy of the node.
- Output nodes are pasted in the same relative position as the original output cells.
- When generated nodes have been grouped and the group is not selected in the copy, the pasted generated nodes are not grouped.
- The remainder node is pasted with the **Prioritize** node.

Process node

Code is copied with the node.

If a process has been selected, the following considerations apply:

- All parameters are copied with their values if the values are set.
- Output nodes cannot be copied by themselves; they must be included in a copy of the node.
- Output nodes are pasted in the same relative position as the original output cells.
- All of the generated nodes of a **Process** node are automatically included with the node when the node is pasted into the same diagram.
- If a **Process** node's generated nodes have been grouped and the node is pasted, the individual nodes are pasted, but the group is not pasted.

Split node

- All parameters are copied with their values if the values are set.
- Output nodes cannot be copied by themselves; they must be included in a copy of the node.
- Output nodes are pasted in the same relative position as the original output cells.
- All of the generated cells of a **Split** node are automatically included with the node when the node is pasted into the same diagram. The exception is when the split is made using values from a previous node and the previous node was not copied. In this case an empty **Split** node is pasted.
- If a **Split** node's generated nodes have been grouped and the node is pasted, the individual nodes are pasted, but the group is not pasted.
- When the **Split** node is pasted into a different diagram, all of the generated nodes of a **Split** node are included with the node. An exception is when the split is made using values from a previous node and the previous node was not copied. In this case, an empty **Split** node is pasted.

- When a **Split** node uses values from a previous node and is pasted into the same diagram without pasting the previous node and all of the nodes between the previous node and the **Split** node, the **Split** node has a Not ready status. The status is Not ready until you reconnect the previous node to the **Split** node or you change the **Split method** selection in the **Split** node.

About Marking Nodes as Segments and Marking Nodes as Linkable

You cannot mark a **Split** or **Prioritize** node without output nodes as segments or linkable. If a node that has a Ready status is at an incompatible subject level, the parent node or output nodes cannot be marked as a segment. You can always mark any node that is in the Not ready status as linkable except the **Split** and **Prioritize** nodes.

When you select **Mark node as segment**, you can click **Manage Custom Properties** to edit and view custom properties, and to complete any missing fields that are required to mark the segment as Ready.

Note: The **Manage Custom Properties** button does not appear if custom properties are not available. For more information, see "Define Custom Properties" on page 143.

View Nodes Marked as Segments

To view information about nodes that have been marked as segments, click on the **Segment Map** tab.

Mark Your Segment Ready

Note: To publish an on-premises segment map, at least one node in the map must be marked as a segment or marked as linkable.

Click the **Orchestration** tab and select **Mark Ready** or **Mark Ready and Publish** to make your segment available to a task. The status changes from Designing to either Ready or Active.

A Ready status indicates that the segment is ready to be published with a task. When a user publishes a task that uses a Ready segment, that user is prompted to confirm that the segment should be published along with the task. Segments with a Ready status can be changed back to a Designing status by clicking **Return to Designing**. Changing this status prevents segments from being published by a task.

To move a segment from a Ready status to an Active status, click **Publish**. Segments with an Active status cannot be changed back to Designing. An Active status does not prevent a task from publishing.

If the content of a published item is changed and saved, that item becomes out of sync with the published version. To synchronize the content, select **Republish**. Otherwise, the item stays out of sync with the published version and the updates are not delivered.

For more information, see "Republishing Out of Sync Items" on page 138.

Schedule Your Segment Map

When you finish updating your segment map, you can set a schedule for the segment map.

On the **Orchestration** tab, complete these actions:

- Click **No schedule** if you plan to publish the segment map manually.
- Click **Set a schedule** to set a time period that the segment map is active.
    - Select a time zone. For example, you might want to select a time zone that is different from the default if the segment map is targeted to a specific locale. By default, the time zone is the same as the time zone that is set for the tenant. If a valid time zone is not set for the tenant, the default time zone is UCT.
    - Click **Single occurrence** to specify a single time span that the segment map is active.
    - Select a start date and an end date for the segment map.

      Note: If you select **Single occurrence**, the start date cannot be edited after the segment map is published.
    - Click **Recurrence** to specify a recurring segment map. Click .

      Specify these details for a recurring schedule:

        - **Start time** is the start time for the first occurrence.
        - **Duration** specifies the amount of time that the content is available for each occurrence. For example, a segment map might start every week on Monday and continue for four days.
        - **Frequency** specifies the schedule for the recurrence. If you click **Weekly**, click the day for each occurrence. You can select multiple days in each week. If you click **Monthly**, select the numbered day or the weekday for the recurrence. For example, you can select the 10th day of each month or the second Tuesday of each month.

          Note: You can edit the weekly or monthly frequency after the segment map is published and the start date has passed. The recurrence must occur within the start and end dates.
        - **Range of recurrence** specifies the start and end dates, or that the recurrence continues without an end date.

Execute the Segment Map

On the **Execution** tab for a published segment map, click **Run Now** to immediately execute the flow, update counts on nodes, and update any segments that have been published.

View Usage Information

From the **Orchestration** ⇨ **Usage** tab, you can view which items use the segment and the items that the segment uses.

The ability to view dependencies between items enables you to see the items that a task depends on to work successfully. Usage information helps you identify how changes that you make to one item might affect another item.

Items That Use the Segment

The first section shows the items that use the segment. For example, if the segment is used in a task, the task is included in the list.

The Priority column displays the priority of like tasks that use the segment. Priority applies only to mobile spot, web spot, and mobile in-app message tasks because each of those task types might have two or more tasks that compete for the same resources. Other task types do not use prioritization.

For non-A/B test tasks, priority is on a scale of 1 through 5 (where 1 is the highest). The default is 3. An A/B test task has a priority of Test, which is higher than a non-A/B test task. An A/B test task always delivers its content.

You can change the priority of a non-A/B test task on the task's **Orchestration** ⇨ **Priority** tab.

Items That the Segment Uses

The second section shows items that the segment uses.

- Click **Directly Related** to list the items that the segment uses. For example, if a segment uses an event, the event is included in the list.
- Click **All Related** to view directly related items as well as any items that those directly related items use. For a segment, the list of directly related and all related items is the same.

  The list displays items with a Designing, Ready, or Active status. Click **Show Designing Status only** to display only items with a Designing status.

To open an item, click the item. To view item details and to open the item, click ℹ in the item's row.

Enable Current Data to Be Used by Linked Nodes

On the **Linking Information** tab for a segment map, click **Use the most current data when referenced by a link** to display the most recent data. This data applies to a segment map that contains a source cell that is referenced by a **Link** node. The data is refreshed when the campaign is executed. The data for static report links is not refreshed. The counts might vary between the current segment map and the segment map that contains the **Link** node. The segment map that contains the **Link** node is updated only when that campaign is opened.

End Your Segment

When your segment is no longer needed, click **End**. The status changes to Complete. Any unsaved changes are lost.

Managing Segment Maps and Segments

From the **Segments** page, you can rename, copy, delete, and open (for editing) a segment map. You can also rename and open a segment. To access the options, select the segment map or segment in the Segment Maps and Segments table and select the appropriate action.

Note: The count that is displayed above the Segment Maps and Segments table indicates the number of rows for both segment maps and segments.

- To rename a segment map or segment, click ⋮ and select **Rename**.

  You cannot rename a segment with a status of Completed or Ended. If you rename a segment map that is published, it becomes out of sync and must be republished.

- To copy a segment map, click ⋮ and select **Copy**.

  Note: This action is not available for segments.

- To open a segment map or segment for editing, click .

  Alternatively, click the name of the segment map or segment in the list.

- To delete a segment map, click .

  You can delete a segment map that is published.

  Note: This action is not available for segments.

TIP After you rename a segment that is included in a segment map, when you return to the segment map, you might need to click to see the change.

Using Save As to Create a Segment Map

To save a segment map with a different file name, open the segment map, click ⋮, and then select **Save As**. Enter a name and click **Save**. You can also save a segment map with a different file name by opening a segment that is being used by the segment map from the Segment Maps and Segments table and then clicking ⋮.

When you use **Save As** to create a segment map, new IDs are generated for the nodes in the new map.

Note: You cannot save a segment with a different file name.

Refining Output for a Node

You can export data from any relationship level that has been previously referred to in the segment map. You can refine your data so that extra output records are not included. Refining the data is useful when you import from tables that are in a many-to-one relationship to the subject of the export table.

On the **Refine by Node Subject** tab in a **Map** or **Export** node, you can refine the output for the node by selecting nodes from the segment map that the **Map** or **Export** node belongs to. The subjects from the selected nodes are used as the refinement condition for the node output. To specify the refinement criteria:

1 On the **Refine by Node Subject** tab, click .

2 Select one or more nodes in the **Available items** panel and click . To select all available nodes, click . To undo your selection, click .

3 Click **OK**.

The **Available items** panel contains upstream nodes that are linked to the node and nodes that are not linked to the node. If you selected multiple cells, the list contains terminal nodes that are not upstream from the cell nodes and upstream nodes that are common to the selected cell nodes.

Unmarking Nodes

To unmark a node as linkable, right-click a node, which displays , and select **Unmark node as linkable**.

Note: Unmarking a node as linkable might cause a segment map to be out of sync. appears next to the segment map in the list on the **Segments** page.

Add Properties to a Segment Map

Perform the following actions on the **Properties** tab:

1 In the **Standard** properties section, modify the values in the fields as desired.

2 In the **Custom** properties section, enter or view information for your custom properties. For more information, see “Define Custom Properties” on page 143.

PART 10

Delivering Direct Marketing Content

43

Direct Marketing Tasks

About Direct Marketing Tasks

A direct marketing task is an outbound channel uses customer data and analytics from SAS Customer Intelligence 360 export files that can be used for print marketing, call centers, web pages, and other marketing channels. Companies might want to create a direct marketing task that sends information from an export file to a marketing channel such as a print catalog. The task selects the message (such as a 10% off coupon) and the target audience for the mailing (such as middle-aged vacationers). The task also includes the export file which contains selected data items from the data hub (such as first name, last name, address, city, state, ZIP code, message code, and so on) that are used to create a mailing label at the mail house.

You can open a task or create a new task from the **Tasks** page. To access the items that a task uses and see information about the task, navigate through the different tabs.

When you create a task, it has a Designing status, which indicates that the task is still being worked on and is not ready to be published. When you finish working on your task, you can either mark it ready to be published, or you can publish it. Before you can successfully publish a task, any items included in that task must have a Ready status or an Active status. A task cannot be published if it contains items that have a Designing status or a Completed status. The items that your task depends on might include data views, spots, segments, or creatives.

For information about creating a direct marketing task that uses data that is stored in the cloud data hub, see “Creating a Cloud Direct Marketing Task”. For information about creating a direct marketing task that uses data from a data mart, see “Creating an On-Premises Direct Marketing Task” on page 530.

Creating a Cloud Direct Marketing Task

Create a Cloud Direct Marketing Task

1 From the navigation bar, click **Tasks**.

2 Click and select **Direct Marketing** to deliver content for direct marketing.

3 Click **Cloud Data Hub**.

4 To build new export data for your content, click **Design your own template for export data** and continue with “Create an Export Table” on page 524.

   To use an existing template to edit and build export data from, click **Use saved template**, select a template, and then click **Create Task**. The data table is exported as a .csv file after the task is published. If you want to edit the export table, see “(Optional) Edit an Export Table for a Saved Template” on page 525. Otherwise, continue with “Add a Message” on page 525. For information about creating and managing export templates, see “Exporting Data in a Direct Marketing Task” on page 51.

   Note: The export file is empty if a selected cloud segment does not have a subject ID.

Create an Export Table

Note: The export table is available only after you publish the task.

1 On the **Content** tab, click .

2 Click **Edit**.

3 On the **Export Selection** tab, click **Add Fields**.

4 In the Select Criteria window, select one or more fields in the Select Criteria window and click **OK**.

   To add more fields, select and select one or more fields in the **Select Criteria** window.

   To delete existing export fields, select the check box in the row for an export field and click .

5 If you want to replace the new export table with a predefined table, click in the **Export Field** column and then select a table.

6 To move output files up or down, select the row for the files and click or .

7 Click **Done** and then continue with "Add a Message" on page 525.

For information about generating a file for the export table, see "Generate a File for an Export Table" on page 528.

(Optional) Edit an Export Table for a Saved Template

Note: The export table is available only after you publish the task.

1 On the **Content** tab, click .

2 Click **Edit** and then make desired changes.

3 Click **Done**.

Add a Message

1 Click to open the **Content Selection** tab.

2 Click **Select Content** to add a message to the task. Although a message is required, the message does not need to contain creatives. If you choose a message that contains creatives such as HTML or plain text, those creatives are ignored by direct marketing tasks.

   Note: Instead of selecting an existing message to add to the task, you can choose to create a message. To create a message, click **New Message**. The message that you create is automatically added to the task.

Add a Target Audience

On the **Targeting** tab, set the criteria that define the target audience for the content that the task delivers.

On the **Eligible** page, you can specify which people to include in your target audience.

Note the following rules about defining the target audience:

- You can select only one criterion. If you do not select a criterion, no content is delivered.
- When you create a target audience using demographic criteria such as city, age, gender, membership status, and so on, only the users who satisfy criteria based on their current data are included in the target audience.
- Previously defined segments can be selected as criteria.

  Note: You must define a login event type if you have tasks that depend on segments with data from logged-in users.
- You can use customer lists that have been imported from other sources, such as SAS Marketing Automation.

Add Properties to Your Task

There are two types of properties that are associated with a task:

Properties that Identify the Task

Examples of properties that identify the task include name, description, code, and category. To update task properties, click the **Properties** tab and modify the values in the fields as desired.

An item can be identified by its code for activities such as auditing and reporting. When an item is imported or migrated to SAS Customer Intelligence 360, the existing code value for the item is retained. Depending on the code settings for your environment, the code value might be editable. This value is not required to be unique to be valid. If the value is editable, you can change it to match the code value for another item. Valid characters for codes are alphanumeric characters, multi-byte characters, numerals, underscores, hyphens, and periods. Blank spaces are not allowed in code formats.

The **Code** field enables marketers to use a segment map to target customers based on their internal attributes (account type, balance, and so on) and their previous interactions. These codes are used to communicate information about the targeted customers to vendors or downstream systems. Using codes can minimize errors in text and punctuation that might occur when using an item name that is typically lengthy.

The information in the **Code** field can be used for operational reporting. The information can also be used to select or suppress customers for targeting messages (for example, a marketing message might target or exclude all customers who responded to direct marketing task *12345*).

The **Category** field is displayed only if the properties available in the system have been assigned a category.

In the **Custom** properties section, add, remove, or select custom properties. For more information, see Chapter 16, “Setting Standard and Custom Properties,” on page 141.

Properties Used for Plans

To add planning information to a task, open the task and click . For more information, see “Creating a Planning Item” on page 259.

To return to the task view after opening the planning view, complete one of these actions:

- Fill out the required planning properties and save the task.
- Navigate to the **Tasks** view and click the task from the list.

Schedule and Start Your Task

When you finish updating your task, you can mark the task ready, publish the task immediately, or set a schedule for the task.

Note: When you schedule a bulk email task, a bulk mobile push notification task, or a direct marketing task, allow a minimum of five minutes between the time you publish the task and the scheduled start time for the task to be active. This time delay is needed by the system to process the request.

On the **Orchestration** tab, take these actions:

- Click **No schedule** if you plan to publish the task manually.
- Click **Set a schedule** to set a time period that the task is active.
  - Select a time zone. For example, you might want to select a time zone that is different from the default if the task is targeted to a specific locale. By default, the time zone is the same as the time zone that is set for the tenant. If a valid time zone is not set for the tenant, the default time zone is UCT.
  - Click **Single occurrence** to specify a single time span that the task is active.
  - Select a start date and an end date for the task.

    Note: If you select **Single occurrence**, the start date cannot be edited after the task is published.
  - Click **Recurrence** to specify a recurring task. Click .

    Specify these details for a recurring schedule:
    - **Start time** is the start time for the first occurrence.
    - **Duration** specifies the amount of time that the content is available for each occurrence. For example, a task might start every week on Monday, and continue for four days.
    - **Frequency** specifies that the schedule for the recurrence. If you click **Weekly**, click the day for each occurrence. You can select multiple days in

each week. If you click **Monthly**, select the numbered day or the weekday for the recurrence. For example, you can select the 10th day of each month or the second Tuesday of each month.

Note: You can edit the weekly or monthly frequency after the task is published and the start date has passed. The recurrence must occur within the start and end dates.

- **Range of recurrence** specifies the start and end dates, or that the recurrence continues without an end date.

- Select **Mark Ready** to change the status from Designing to Ready. A Ready status indicates that this item is ready to be published. When you are ready to promote an item from a Ready status to an Active status, click **Publish**.

  Note: When you publish an item, you are prompted to publish any dependent items that are marked Ready.

  Items with a Ready status can be changed back to a Designing status by clicking **Return to Designing**. Changing this status to Designing prevents the item from being published.

  Note: If your item has a Ready status and a start date, the item is not automatically published when the start date is reached. For example, if you are creating a task, it must be published in order for the start date to activate the task.

- Select **Mark Ready and Publish** to change the status from Designing to Active. Items with an Active status cannot be changed back to Designing.

Changes to a scheduled or active task are not automatically propagated to the published version of the task. You must republish the task after you save it to resolve the Out of Sync status. Otherwise, the task stays out of sync with the published version and the updates are not delivered.

When the end date of a task is reached, its status changes to Complete. Completed tasks cannot be modified. The task stops any associated data collection and makes the task's content unavailable. In addition, any unsaved changes are lost.

Note: A recurring schedule is not available if the task is included in an activity.

Generate a File for an Export Table

Note: You must publish the cloud direct marketing task before you can generate a file for an export table.

1 On the **Orchestration** tab, click **Export File**.

2 Click **Refresh URL** to refresh the URL for the table.

  Note: The expiration date for the URL appears when you click ⚠. If the task is active, you might need to click **Refresh URL** again because the output file might be in the process of being generated.

3 Click **Download** to download the file from the browser.

  Note: If the direct marketing task name includes the “?”,”\”,”<”,”>”,”*”, or “|” characters, SAS Customer Intelligence 360 converts the characters to underscores (“_”) when you download the file.

The Google Chrome browser does not recognize ',' in a filename. If a filename includes ",", a blank error screen might appear when you view the file in Chrome.

4 Click **Copy Link** to copy the URL to the clipboard.

View Usage Information

From the **Orchestration** ⇨ **Usage** tab, you can view which items use the task and the items that the task uses.

The ability to view dependencies between items enables you to see the items that a task depends on to work successfully. Usage information helps you identify how changes that you make to one item might affect another item.

Items That Use the Task

The first section shows the items that use the task. For example, if the task is used in an activity, the activity is included in the list.

The Channel, Priority, and Type columns do not apply to activities and are therefore empty.

Items That the Task Uses

The second section shows items that the task uses.

- Click **Directly Related** to list the items that the task uses. For example, if a task uses a creative, the creative is included in the list.
- Click **All Related** to view directly related items as well as any items that those directly related items use. For example, you might see the creative that the task uses and the asset that is used by the creative.

  The list displays items with a Designing, Ready, or Active status. Click **Show Designing Status only** to display only items with a Designing status.

To open an item, click the item. To view item details and to open the item, click ⓘ in the item's row.

Note: HTML assets that are the content source for mobile spot, web spot, and email creatives are not listed.

Pause the Task

You can pause an active task to temporarily stop delivery of a task. For example, if you want to correct the percentage of a discount that is offered, you can pause the task, edit the amount, and republish. You do not need to end a task in order to update the content. You can make the same changes to a paused task that you can make to an active task.

When a task is paused, you can resume the task to restart content delivery or end the task.

To pause an active task, select **Pause** on the **Orchestration** tab.

During the time that a task is paused, content is no longer delivered. Customers are not selected by the task. Data such as conversions continues to be collected based on impressions that were viewed prior to the pause. When the task resumes, new data is added to the data that was collected before the pause.

Content delivery that does not rely on a trigger and is in progress, such as bulk mobile push notifications, might continue for items that are already in the queue.

If the task is paused and the content has not changed, select **Resume** to make the task active again.

If task content is changed and saved, the task becomes out of sync. Select **Republish** to make the task active again and to deliver the updated content.

End Task

Click **End** on the **Orchestration** tab when you no longer need the task to deliver a message or when the scheduled end date is reached. The status changes from Active to Completed. Completed tasks do not collect new data and cannot be modified. Any unsaved changes to the task are lost.

Note: If a direct marketing task is scheduled and is ended before its start date, the task displays the status **Canceled**.

Creating an On-Premises Direct Marketing Task

Create an On-Premises Direct Marketing Task

1 From the navigation bar, click **Tasks**.

2 Click and select **Direct Marketing** to deliver content for direct marketing.

3 Click **On-Premises Datamart**.

4 To build new export data for your content, click **Design your own template for export data** and continue with “Create an Export Table” on page 524.

   To use an existing template to edit and build export data from, click **Use saved template**, select a template, and then click **Create Task**. The data table is exported as an output file after the task is published.

   If you want to edit the export table, see see “(Optional) Edit an Export Table for a Saved Template” on page 533. Otherwise, continue with “Add Segments and Messages to an On-Premises Direct Marketing Task” on page 533. For information about creating and managing export templates, see “Exporting Data in a Direct Marketing Task” on page 51.

Note: The export file is empty if a selected cloud segment does not have a subject ID.

Create an Export Table

Note: The export table is available only after you publish the task.

1 On the **Export Content** tab, click .

2 Click **Edit**.

3 On the **Properties** tab, complete the following actions:

- Select **Comma separated values (.csv)**, **SAS data set**, or **Table** from the **Output type** list.
- Enter information in the **Export name** field. To use variable tags for the export name, click . For more information, see "Use Variables to Create Export File Names" on page 532.

  Note: If you are creating a .csv file, enter a name for the export file using alphanumeric or double-byte characters. The character limit is dependent on your operating system. The export name must begin with a letter or an underscore.

  If you are creating a SAS data set, enter a name for the export file using alphanumeric characters (A–Z, a–z, 0–9), %, and underscores. You can enter up to 32 characters. The export name must begin with an alphanumeric character or an underscore.

  If you are creating a table, enter a name for the export file using alphanumeric or double-byte characters. (Only these special characters are allowed: &, %, and periods.) You can enter up to 32 characters. The export name must begin with a letter or an underscore.
- In the **Export location** field, specify a default export location for the new export table.
- (Optional) Select **Include header row** to add a header row to the export template so that the exported data displays the output name for every export field.
- (Optional) Select **Discard rows with duplicate subject IDs per input node** to exclude duplicate subject IDs from the export file. In the case of a single node where a field being exported has a many-to-one relationship with the subject ID of the node, duplicates are excluded. For example, duplicate subject IDs are excluded when the subject ID is "Customer," and a single customer has multiple accounts.

4 On the **Export Selection** tab, click **Add Fields**.

5 In the Select Criteria window, select one or more fields in the Select Criteria window and click **OK**.

To add more fields, select and select one or more fields in the **Select Criteria** window.

To delete existing export fields, select the check box in the row for an export field and click 🗑.

6 Enter information in the Output Name column for each export field.

Note: The name of the export output file must be unique.

7 (Optional) In the Format column for an export field, use the standard SAS format to specify the formatting of your data. (For example, you can specify a currency format or a date format.) For information about formatting, see *SAS Formats and Informats: Reference*.

8 If you want to replace the new export table with a predefined table, click 📂 in the **Export Field** column and then select a table.

9 To move output files up or down, select the row for the files and click ▲ or ▼.

10 On the **Sorting Options** tab, click **Add Sort Order** to specify whether the columns are sorted in ascending or descending order. Click ➕ to create an additional sort order.

Note: The **Add Sort Order** button is not available if no export fields have been created.

11 Click **Done** and then continue with "Add Segments and Messages to an On-Premises Direct Marketing Task" on page 533.

Use Variables to Create Export File Names

You can use variables to generate text strings in the export file names. For example, if you want to be able to search for files that are exported by a particular task, you can create file names that are based on the task name.

The following variables generate file names:

%%EXPDATE%%
: date that the export was created. The format is yyyymmdd (for example, "20191231").

%%EXPTIME%%
: time that the export was created in the format hhmmss (for example, "235959"). The time is based on the time zone of the server.

%%TASKCODE%%
: task code.

%%TASKNAME%%
: task name.

%%USERID%%
: user ID.

You can add text to variables and combine multiple variables. For example, if a task code is `123_TASK` and a task name is NAME_TASK, an output name of `test%%TASKCODE%%%%TASKNAME%%` generates a file named test123_TASKNAME_TASK.

In the generated name, all non-alphanumeric characters, except for underscores, are replaced with underscores (_). The 32-character limit on output file names is not applied. When an output name value contains % or &, the length limits on output names are not enforced. If expansion of the output name results in a file name that is greater than the maximum number of allowed characters for that output type, a stored process error might result. Ensure that the length of the expanded output name is suitable for the destination output type.

CAUTION! Invalid file names cause a run-time failure. Ensure that the generated file names follow length, character, operating system, database, and other restrictions.

(Optional) Edit an Export Table for a Saved Template

Note: The export table is available only after you publish the task.

1. On the **Export Content** tab, click .
2. Click **Edit** and then make desired changes.
3. Click **Done**.

Add Segments and Messages to an On-Premises Direct Marketing Task

On the **Targeting** tab, select the segments and messages for the content that the task delivers.

To add segments:

1. Click **Add Segment** to add a segment row.
2. In the Select Segment window, select one or more segments.

   To locate segments, use these options:

   - Click to display a hierarchical folder view of segments. Click to display individual merge tags in alphabetical order.
   - Click to expand all of the folders. Click to collapse all of the folders.
   - Click to view details, if available, about the criteria.
   - Search for a segment by entering the name in the **Search** field. Select the segment and click to display details.
3. Click **OK**.

   The selected segments appear in the table on the **Targeting** tab.

   To view the segment map that a segment belongs to, select in the row for the segment and click **View**.

   To add more segments, click and then select the desired segments.

   To delete segments, select the rows for the segments and click .

4 To refine the output for the segment so that extra output records are not included:

   a Click in the Output Refinement column.

   b Select one or more nodes in the **Available items** panel and click . To select all available nodes, click . To undo your selection, click .

   c Click **OK**.

5 To add messages to the task:

   a Click in the Message column.

   b In the Select Content window, select one or more messages.

   Although at least one message is required for task, messages do not need to contain creatives. If you choose a message that contains creatives such as HTML or plain text, those creatives are ignored by direct marketing tasks.

   Note: Instead of selecting an existing message to add to the task, you can choose to create a message. To create a message, click **New Message**. The message that you create is automatically added to the task.

Add Properties to Your Task

There are two types of properties that are associated with a task:

Properties that Identify the Task

Examples of properties that identify the task include name, description, code, and category. To update task properties, click the **Properties** tab and modify the values in the fields as desired.

An item can be identified by its code for activities such as auditing and reporting. When an item is imported or migrated to SAS Customer Intelligence 360, the existing code value for the item is retained. Depending on the code settings for your environment, the code value might be editable. This value is not required to be unique to be valid. If the value is editable, you can change it to match the code value for another item. Valid characters for codes are alphanumeric characters, multi-byte characters, numerals, underscores, hyphens, and periods. Blank spaces are not allowed in code formats.

The **Code** field enables marketers to use a segment map to target customers based on their internal attributes (account type, balance, and so on) and their previous interactions. These codes are used to communicate information about the targeted customers to vendors or downstream systems. Using codes can minimize errors in text and punctuation that might occur when using an item name that is typically lengthy.

The information in the **Code** field can be used for operational reporting. The information can also be used to select or suppress customers for targeting messages (for example, a marketing message might target or exclude all customers who responded to direct marketing task *12345*).

The **Category** field is displayed only if the properties available in the system have been assigned a category.

To generate a contact event for each customer that is included in the export file for this task, click **Generate contact events for this task**.

In the **Custom** properties section, add, remove, or select custom properties. For more information, see Chapter 16, "Setting Standard and Custom Properties," on page 141.

Properties Used for Plans

To add planning information to a task, open the task and click . For more information, see "Creating a Planning Item" on page 259.

To return to the task view after opening the planning view, complete one of these actions:

- Fill out the required planning properties and save the task.
- Navigate to the **Tasks** view and click the task from the list.

Schedule and Start Your Task

When you finish updating your task, you can mark the task ready, publish the task immediately, or set a schedule for the task.

Note: When you schedule a bulk email task, a bulk mobile push notification task, or a direct marketing task, allow a minimum of five minutes between the time you publish the task and the scheduled start time for the task to be active. This time delay is needed by the system to process the request.

On the **Orchestration** tab, take these actions:

- Click **No schedule** if you plan to publish the task manually.
- Click **Set a schedule** to set a time period that the task is active.
  - Select a time zone. For example, you might want to select a time zone that is different from the default if the task is targeted to a specific locale. By default, the time zone is the same as the time zone that is set for the tenant. If a valid time zone is not set for the tenant, the default time zone is UCT.
  - Click **Single occurrence** to specify a single time span that the task is active.
  - Select a start date and an end date for the task.

    Note: If you select **Single occurrence**, the start date cannot be edited after the task is published.
  - Click **Recurrence** to specify a recurring task. Click .

    Specify these details for a recurring schedule:

    - **Start time** is the start time for the first occurrence.
    - **Duration** specifies the amount of time that the content is available for each occurrence. For example, a task might start every week on Monday, and continue for four days.
    - **Frequency** specifies that the schedule for the recurrence. If you click **Weekly**, click the day for each occurrence. You can select multiple days in

each week. If you click **Monthly**, select the numbered day or the weekday for the recurrence. For example, you can select the 10th day of each month or the second Tuesday of each month.

Note: You can edit the weekly or monthly frequency after the task is published and the start date has passed. The recurrence must occur within the start and end dates.

- **Range of recurrence** specifies the start and end dates, or that the recurrence continues without an end date.

- Select **Mark Ready** to change the status from Designing to Ready. A Ready status indicates that this item is ready to be published. When you are ready to promote an item from a Ready status to an Active status, click **Publish**.

  Note: When you publish an item, you are prompted to publish any dependent items that are marked Ready.

  Items with a Ready status can be changed back to a Designing status by clicking **Return to Designing**. Changing this status to Designing prevents the item from being published.

  Note: If your item has a Ready status and a start date, the item is not automatically published when the start date is reached. For example, if you are creating a task, it must be published in order for the start date to activate the task.

- Select **Mark Ready and Publish** to change the status from Designing to Active. Items with an Active status cannot be changed back to Designing.

Changes to a scheduled or active task are not automatically propagated to the published version of the task. You must republish the task after you save it to resolve the Out of Sync status. Otherwise, the task stays out of sync with the published version and the updates are not delivered.

When the end date of a task is reached, its status changes to Complete. Completed tasks cannot be modified. The task stops any associated data collection and makes the task's content unavailable. In addition, any unsaved changes are lost.

Note: A recurring schedule is not available if the task is included in an activity.

Pause the Task

You can pause an active task to temporarily stop delivery of a task. For example, if you want to correct the percentage of a discount that is offered, you can pause the task, edit the amount, and republish. You do not need to end a task in order to update the content. You can make the same changes to a paused task that you can make to an active task.

When a task is paused, you can resume the task to restart content delivery or end the task.

To pause an active task, select **Pause** on the **Orchestration** tab.

During the time that a task is paused, content is no longer delivered. Customers are not selected by the task. Data such as conversions continues to be collected based on impressions that were viewed prior to the pause. When the task resumes, new data is added to the data that was collected before the pause.

Content delivery that does not rely on a trigger and is in progress, such as bulk mobile push notifications, might continue for items that are already in the queue.

If the task is paused and the content has not changed, select **Resume** to make the task active again.

If task content is changed and saved, the task becomes out of sync. Select **Republish** to make the task active again and to deliver the updated content.

End Task

Click **End** on the **Orchestration** tab when you no longer need the task to deliver a message or when the scheduled end date is reached. The status changes from Active to Completed. Completed tasks do not collect new data and cannot be modified. Any unsaved changes to the task are lost.

Note: If a direct marketing task is scheduled and is ended before its start date, the task displays the status **Canceled**.

Specify Schedules for Running Associated Segment Maps

From the **Orchestration** ⇨ **Dependencies** tab, you specify schedule dependencies for running segment maps that are associated with any segments that are being used by the direct marketing task for targeting. You might want to specify a time for rerunning on-premises segments so that the counts are refreshed before publishing the task.

If you do not want to rerun an associated segment map before the task is run, select **Never run**. If you want to always rerun an associated segment map before the task is run, select **Always run**. To specify a time frame for running the segment map after the task is published, select **When the task is published, run the segment map only if it is older than the following specified time frame**, and then specify the number of hours and days that you want to elapse before the segment map is run.

Note: You cannot manually publish a direct marketing task if the task is associated with a segment map that has not been executed and **Never run** is the specified schedule dependency.

Add a Process Node

From the **Orchestration** ⇨ **Post Process** tab, you can add **Process** nodes that will be run in the last step in an on-premises export process. The **Mark node as segment** and **Mark node as linkable settings** are not available for the **Process** nodes in the map on the **Post Process** tab. For information about adding **Process** nodes, see "Add a Process Node" on page 505. You must publish the direct marketing task to view the updated counts for the nodes that are being post-processed.

Note: You cannot publish a direct marketing task if an added **Process** node is in the Not Ready state.

View Usage Information

From the **Orchestration** ⇨ **Usage** tab, you can view which items use the task and the items that the task uses.

The ability to view dependencies between items enables you to see the items that a task depends on to work successfully. Usage information helps you identify how changes that you make to one item might affect another item.

Items That Use the Task

The first section shows the items that use the task. For example, if the task is used in an activity, the activity is included in the list.

The Channel, Priority, and Type columns do not apply to activities and are therefore empty.

Items That the Task Uses

The second section shows items that the task uses.

- Click **Directly Related** to list the items that the task uses. For example, if a task uses a creative, the creative is included in the list.
- Click **All Related** to view directly related items as well as any items that those directly related items use. For example, you might see the creative that the task uses and the asset that is used by the creative.

  The list displays items with a Designing, Ready, or Active status. Click **Show Designing Status only** to display only items with a Designing status.

To open an item, click the item. To view item details and to open the item, click ⓘ in the item’s row.

Note: HTML assets that are the content source for mobile spot, web spot, and email creatives are not listed.

PART 11

Delivering Content to an External System

44

Working with External Tasks

About External System Tasks

You use an external system task to send a creative to an agent when criteria for the task are met. For example, you can create an external system task that sends an electronic products creative to an agent that is connected to a Point-of-Sale (POS) system. If you specified that viewing an electronic product on the Spring Promotion page is a trigger event for the task, the task sends the information about the creative to the agent, which in turn sends the information to the POS system. The POS system can then use the information about the creative to display information about the electronic creative to a customer who viewed the product on the Spring Promotion page.

You can open a task or create a task from the **Tasks** page. To access the items that a task uses and see information about the task, navigate through the different tabs.

- The **Content** tab contains information about the creative delivered with your task.
- The **Targeting** tab contains the details about your target audience, including a summary of all criteria that make up the target audience. You can specify who to include or exclude from your target audience by adding criteria.
- The **Properties** tab contains information about the task's name, description, and code.

- The **Orchestration** tab contains the schedule for the task.

  The tab also contains information about specified trigger events, the specified name for the outgoing event, and the agents that receive content from the task.

  The tab also contains details about any item associated with the task. There is a list of items that the task uses and a list of items that use the task. From this tab, you can see the items your task depends on to work successfully.

When you create a task, it has a Designing status, which indicates that the task is still being worked on and is not ready to be published. When you finish working on your task, you can either mark it ready to be published, or you can publish it. Before you can successfully publish a task, any items included in that task must have a Ready status or an Active status. A task cannot be published if it contains items that have a Designing status or a Completed status. The items that your task depends on might include data views, spots, segments, or creatives.

Creating an External System Task

Add Content to Your Task

All of the details and items associated with the content that your task delivers are specified on the **Content** tab. Use the icons to change the spot, message, and creatives that the task uses. You can also set the distribution and impression limits for the creatives or add targeting criteria to each creative associated with the task.

Add an External System Task

1 From the navigation bar, click **Tasks**.

2 Click and select **External System** to use an external system to deliver content.

3 Select agents that will have access to external events or content, and then click **Create Task**.

Add Message or Creatives

1 Click .

2 Click **Select Content** to add a message or creatives to the task. If there is more than one creative, in the **Select creatives** section, select which creatives the task displays.

   Note: Instead of selecting an existing message or creative to add to the task, you can choose to create a message or creative. To create a message or creative, click **New Message** or **New Creative**. The message or creative that you create is automatically added to the task.

For information about using merge tags in HTML creatives, see "Personalizing HTML Creatives" on page 630.

Set Distribution of Content

If this task contains more than one creative, you can refine how each creative is displayed. Click to open the **Distribution** tab and select the method that you want the task to use when determining how to display content.

Frequency Distribution

Select **Frequency** to specify how often a creative is displayed compared with the other creatives in this task. Next, set a percentage for each creative.

Note: Frequency is the default distribution method. By default, each creative is assigned equal distribution.

Sequential Distribution

Select **Sequential** to set the order in which the creatives are displayed.

CAUTION! The order is reset every 24 hours. After 24 hours, the order is reset and the first creative in the sequence is selected again. If the content delivery schedule for your task is longer than 24 hours, the creatives might not be displayed in the order that you have specified.

Set Impression Limits

Click to limit the number of times a customer sees your content.

- Select **Limit total impressions per user** to specify the total number of times a creative is displayed to a customer. This limit is valid for the duration of this task.
- Select **Limit impressions per user by period.**

  Select **Time period** to specify the maximum number of impressions that a user sees during a specified time interval (for example, minutes, hours, days, or months).

  Select **Session** to limit the number of impressions that a user sees while interacting with content, such as your website or mobile app. By default, the session is set to expire after 30 minutes of inactivity, but you can contact a SAS representative to modify this value.

Add a Target Audience

On the **Targeting** tab, set the criteria that define the target audience for the content that the task delivers.

On the **Eligible** page, you can specify which people to include in your target audience. On the **Exclusions** page, you can specify which people to exclude from your target audience.

Note the following rules about defining the target audience:

- If no criteria are added, the target audience includes everyone.
- When you create a target audience using demographic criteria such as city, age, gender, membership status, and so on, only the users who satisfy criteria based on their current data are included in the target audience.
- Previously defined segments, events, and data views can be selected as criteria.

  Note: You must define a login event type if you have tasks that depend on segments with data from logged-in users.

  TIP The attributes of the events or data views added to the targeting criteria can be selected as values for personalization variables by navigating to **Content** ⇨ **Personalization**. For more information about delivering personalized content, see "Personalizing HTML Creatives" on page 630.

- You can use customer lists that have been imported from other sources, such as SAS Marketing Automation.
- When you add **Browser and Device** to your criteria, only the people who are using that browser or device during the current session are included in the target audience. For example, if you add Chrome as the browser, only the people who are using Chrome during the current session are eligible to be included in the target audience.
- When you add a spot attribute that contains a URL query string parameter, the value of that parameter needs to be decoded for multi-byte character sets (MBCS). If you are adding a URL query string, the value should be encoded for MBCS.

To add criteria:

1 Click **Eligible** or **Exclusions**.

2 Click ✚ to add a criteria row.

3 In the **Specify criteria** box, click .

4 In the **Select Criteria** window, select the criteria to add.

   To locate criteria, use these options:

   - Click to display a hierarchical folder view of criteria. Click to display individual merge tags in alphabetical order.
   - Click to expand all of the folders. Click to collapse all of the folders.
   - Click to view details, if available, about the criteria.

- Search for criteria by entering the name in the **Search** field. Select criteria and click to display details.

5 Click **OK**.

6 If applicable, in the **Specify values** box, click and specify a value for the criteria.

For example, if channel is your selected criterion, you might specify a value of mobile or web. Whereas, there is no need to specify a value if a segment is selected.

7 Repeat steps 1-6 to add criteria.

8 Use these options to work with the criteria list:

- Click to view a summary of the criteria.
- Click to make a copy of the criteria. Copying criteria saves steps when you use the same criteria but supply different values.
- Click or to move criteria up or down in the list. The position determines the order in which the criteria are checked.
- Click to create a group for a set of criteria. Groups enable you to nest criteria.
- Click to delete criteria.

9 Select **All of the following** to include members who meet all of the criteria in a group. Or, select **Any of the following** to include members who meet one or more of the criteria in a group.

10 Click .

Add Properties to Your Task

There are two types of properties that are associated with a task:

Properties that Identify the Task

Examples of properties that identify the task include **Description** and **Code.** To update task properties, click the **Properties** tab and modify the values in the fields as desired.

An item can be identified by its code for activities such as auditing and reporting. When an item is imported or migrated to SAS Customer Intelligence 360, the existing code value for the item is retained. Depending on the code settings for your environment, the code value might be editable. This value is not required to be unique to be valid. If the value is editable, you can change it to match the code value for another item. Valid characters for codes are alphanumeric characters, multi-byte characters, numerals, underscores, hyphens, and periods. Blank spaces are not allowed in code formats.

The **Code** field enables marketers to use a segment map to target customers based on their internal attributes (account type, balance, and so on) and their previous interactions. These codes are used to communicate information about the targeted customers to vendors or downstream systems. Using codes can minimize errors in text and punctuation that might occur when using an item name that is typically lengthy.

The information in the **Code** field can be used for operational reporting. The information can also be used to select or suppress customers for targeting messages (for example, a marketing message might target or exclude all customers who responded to direct marketing task *12345*).

Properties Used for Plans

To add planning information to a task, open the task and click . For more information, see "Creating a Planning Item" on page 259.

To return to the task view after opening the planning view, complete one of these actions:

- Fill out the required planning properties and save the task.
- Navigate to the **Tasks** view and click the task from the list.

Schedule and Start Your Task

When you finish updating your task, you can mark the task ready, publish the task immediately, or set a schedule for the task.

Note: When you schedule a bulk email task, a bulk mobile push notification task, or a direct marketing task, allow a minimum of five minutes between the time you publish the task and the scheduled start time for the task to be active. This time delay is needed by the system to process the request.

On the **Orchestration** tab, take these actions:

- Click **No schedule** if you plan to publish the task manually.
- Click **Set a schedule** to set a time period that the task is active.
  - Select a time zone. For example, you might want to select a time zone that is different from the default if the task is targeted to a specific locale. By default, the time zone is the same as the time zone that is set for the tenant. If a valid time zone is not set for the tenant, the default time zone is UCT.
  - Click **Single occurrence** to specify a single time span that the task is active.
  - Select a start date and an end date for the task.

    Note: If you select **Single occurrence**, the start date cannot be edited after the task is published.
  - Click **Recurrence** to specify a recurring task. Click .

    Specify these details for a recurring schedule:
    - **Start time** is the start time for the first occurrence.
    - **Duration** specifies the amount of time that the content is available for each occurrence. For example, a task might start every week on Monday, and continue for four days.
    - **Frequency** specifies that the schedule for the recurrence. If you click **Weekly**, click the day for each occurrence. You can select multiple days in

each week. If you click **Monthly**, select the numbered day or the weekday for the recurrence. For example, you can select the 10th day of each month or the second Tuesday of each month.

Note: You can edit the weekly or monthly frequency after the task is published and the start date has passed. The recurrence must occur within the start and end dates.

- **Range of recurrence** specifies the start and end dates, or that the recurrence continues without an end date.

- **Extend metrics analysis** continues collecting data after the last occurrence. Select the number of days to extend data collection. The default value is 7 days. For example, if you use the default value, and the **Start time** is 9:00 PM, data collection continues until 9:00 PM seven days after the **End by** date.

  Customers might respond several days after the last occurrence. You can extend the time for data collection in order to more effectively measure task performance.

  During the extended period of data collection, the status is Active - Metrics Only. The status changes to Complete when the **Extend metrics analysis** period is over.

- Select **Mark Ready** to change the status from Designing to Ready. A Ready status indicates that this item is ready to be published. When you are ready to promote an item from a Ready status to an Active status, click **Publish**.

  Note: When you publish an item, you are prompted to publish any dependent items that are marked Ready.

  Items with a Ready status can be changed back to a Designing status by clicking **Return to Designing**. Changing this status to Designing prevents the item from being published.

  Note: If your item has a Ready status and a start date, the item is not automatically published when the start date is reached. For example, if you are creating a task, it must be published in order for the start date to activate the task.

- Select **Mark Ready and Publish** to change the status from Designing to Active. Items with an Active status cannot be changed back to Designing.

Changes to a scheduled or active task are not automatically propagated to the published version of the task. You must republish the task after you save it to resolve the Out of Sync status. Otherwise, the task stays out of sync with the published version and the updates are not delivered.

When the end date of a task is reached, its status changes to Complete. Completed tasks cannot be modified. The task stops any associated data collection and makes the task's content unavailable. In addition, any unsaved changes are lost.

Note: A recurring schedule is not available if the task is included in an activity.

Pause the Task

You can pause an active task to temporarily stop delivery of a task. For example, if you want to correct the percentage of a discount that is offered, you can pause the task, edit the amount, and republish. You do not need to end a task in order to update the content. You can make the same changes to a paused task that you can make to an active task.

When a task is paused, you can resume the task to restart content delivery or end the task.

To pause an active task, select **Pause** on the **Orchestration** tab.

During the time that a task is paused, content is no longer delivered. Customers are not selected by the task. Data such as conversions continues to be collected based on impressions that were viewed prior to the pause. When the task resumes, new data is added to the data that was collected before the pause.

Content delivery that does not rely on a trigger and is in progress, such as bulk mobile push notifications, might continue for items that are already in the queue.

If the task is paused and the content has not changed, select **Resume** to make the task active again.

If task content is changed and saved, the task becomes out of sync. Select **Republish** to make the task active again and to deliver the updated content.

End the Task

Click **End** on the **Orchestration** tab when you no longer need the task to run or when the scheduled end date is reached. The status changes from Active to Complete. Completed tasks do not collect new data and cannot be modified. Any unsaved changes to the task are lost.

Specify the Event That Triggers the Task

To add a trigger that prompts the task to deliver content, click **Trigger** on the **Orchestration** tab, and then select an event. Specify criteria and values to add attribute conditions. Content is delivered when all of the conditions are met.

When you add an event to your task, you can change the occurrence and time period of the event. The occurrence defines how often the event must occur. The time period defines when the event must occur in order to be eligible. By default, an event must occur at least once in the past week. To change the occurrence or time period of an event, click and set the event occurrence details.

Specify the number of times the event must occur in order to trigger the task. Set an operator and value for **Occurrences**. For example, you can set the **Occurrence** to **Less than (<)** 5. This setting is how you specify that an event must occur at most four times in order for a person to be eligible.

Set the time period in which all occurrences must occur:

- Select **Relative** to define a time period relative to the current day, such as within the past week.
- Select **Absolute** to define a time period with specific dates. For example, you can set the time period so that the event occurs at least one time before a specified date or between two specified dates.

- Select **None** when you do not need to define a time period for the event. Events that are added to a segment and do not have a defined time period are eligible anytime they occur.

For example, you want your task to be triggered when your customers have visited your website's home page at least three times since January 1, 2016.

1. Define an event that detects and records a customer's view of your site's home page.
2. Create a trigger in a task that uses that event as a criterion.
3. Set the occurrence and time period details for the event that detects a customer's view of the home page. Set **Occurrences** to **Greater than (>)** 2. Select **Absolute** for the date range, and then set the time period to be greater than or equal to January 1, 2016.

Name the Outgoing Event

On the **Orchestration** tab, click **Outgoing Information** and enter a name for the outgoing event and the selected creatives that will be sent to specified agents. If you do not enter an event name, the default name is “Outgoing_*next available integer*”. You can open the selected creatives by clicking a link in the table.

Specify Agents for the Event

On the **Orchestration** tab, click **Agent** and select the agents that you want to receive content from the task.

Items That the Task Uses

The second section shows items that the task uses.

- Click **Directly Related** to list the items that the task uses. For example, if a task uses a creative, the creative is included in the list.
- Click **All Related** to view directly related items as well as any items that those directly related items use. For example, you might see the creative that the task uses and the asset that is used by the creative.

  The list displays items with a Designing, Ready, or Active status. Click **Show Designing Status only** to display only items with a Designing status.

To open an item, click the item. To view item details and to open the item, click *i* in the item’s row.

Note: HTML assets that are the content source for mobile spot, web spot, and email creatives are not listed.

Using Save as to Create a Task

To save a task with a different filename, click ⋮ and select **Save As**. Enter a name and click **Save**.

PART 12

Delivering Email Content

45

Creating Email Content

About Email Content

Deliver information and call-to-action content to your recipient's inbox by creating tasks that send emails. Use email tasks to track and collect data about how your recipients interact with the content in the email. Use this information to gain insights and view reports about the performance of your email campaign.

These items are used to deliver and track email content:

Email Event
: An email event enables you to capture data about customer behavior or action. Events can be used to trigger a task or define a target audience, or they can be combined with other event types in a data view. Examples of email events include send events, click events, open events, hard bounce events, opt-out events, and complaint events. For more information, see " About Email Events" on page 375.

Email Layout and Template
: An email layout is the arrangement of content elements, such as text, images, buttons, and creatives that are delivered to a recipient. An email layout can be saved as a template and reused. For more information, see "Adding Content to a Task" on page 562.

Creative
: A creative represents a combination of the assets and HTML that you want to deliver in an email. For example, you might combine a couple of assets and some HTML text to create the content that you want to send to your recipient.

  In an email task, creatives are contained within a content block that you add to your email layout. You can add creatives directly to a content block. Or, you can group multiple creatives in a message and add the message to a content block.

If you add multiple creatives, you can personalize each creative for a different subset of the target audience. For more information, see " Creating Email Creatives" on page 554 and "Add a Content Block" on page 580.

Message
In an email task, a message is contained within a content block that you added to your email layout. You can create a message to group multiple creatives, and then add the message to a content block. A message can contain one or more creatives. For more information, see " Creating Email Messages" on page 557 and "Add a Content Block" on page 580.

Send Agent
A send agent represents a connection to an outbound mail server for the delivery of emails. For example, a connection that is configured to the Amazon Simple Email Service (SES) might be defined as a send agent. To deliver email content, you must select a send agent for each email task. For more information, see "Delivering Emails" on page 597.

Creating Email Creatives

About Email Creatives

A creative represents a combination of assets and HTML content that is delivered in an email. In an email task, creatives are contained within a content block that you add to your email layout. You can add creatives directly to a content block or group multiple creatives in a message, and then add the message to a content block.

If you add multiple creatives, you can personalize each creative for a different subset of the target audience. For example, you can add a content block and select a message that contains two creatives. The creative that displays sports apparel for men is sent to male recipients, and the creative that displays sports apparel for women is sent to female recipients. For information about how to personalize a creative, see "Add a Content Block" on page 580.

You can access creatives by navigating to **Creatives** from the navigation bar, or by opening a message that contains the creative.

Import Assets as Creatives

1 From the navigation bar, click **Creatives**.

2 Click ⋮ .

3 Select **Add Creative from Asset**.

4 Click the **Content source** drop-down list and select an option:

- Select **SAS Digital Asset Management** to add assets from the internal repository in SAS Customer Intelligence 360. This option is selected by default.
- Select **Third Party CMS** to add assets from an external content management system (CMS) that is integrated with SAS Customer Intelligence 360.

  For information about integrating content management systems with SAS Customer Intelligence 360, see Chapter 63, “Integrating with Content Management Systems,” on page 829.

5 Select an asset and click **Done**.

Note: The name of a new creative matches the name of the asset that it was created from. The status of the new creative is Designing.

6 When your creative is ready to be published with other items, navigate to the **Orchestration** tab and update the status.

- Click **Mark Ready** when you are finished updating the creative but do not want to publish it. This action changes the status to Ready. You can change the status back to Designing if necessary.
- Click **Mark Ready and Publish** or **Publish** to publish the creative. This action changes the status to Active. Active creatives cannot be changed back to a Ready or Designing status.

If the content of a published item is changed and saved, that item becomes out of sync with the published version. To synchronize the content, select **Republish**. Otherwise, the item stays out of sync with the published version and the updates are not delivered.

For more information, see “Republishing Out of Sync Items” on page 138.

For more information, see “About Assets” on page 420.

Create Creatives

To create a creative:

1 From the navigation bar, click **Creatives**.

2 Click .

3 Select **HTML** to edit the HTML source, embed content from a URL, or import an existing asset into a creative.

Note: A creative's HTML character count cannot exceed 2,048 characters.

4 Click **Done**.

5 Click . Enter a name for the creative and click **Save**.

6 To modify the creative after it is created, navigate to **Content** ⇨ **Layout** and click **Edit**.

7 When your creative is ready to be published with other items, navigate to the **Orchestration** tab and update the status.

- Click **Mark Ready** when you are finished updating the creative but do not want to publish it. This action changes the status to Ready. You can change the status back to Designing if necessary.
- Click **Mark Ready and Publish** or **Publish** to publish the creative. This action changes the status to Active. Active creatives cannot be changed back to a Ready or Designing status.

If the content of a published item is changed and saved, that item becomes out of sync with the published version. To synchronize the content, select **Republish**. Otherwise, the item stays out of sync with the published version and the updates are not delivered.

For more information, see “Republishing Out of Sync Items” on page 138.

Manage Creatives

From the **Creatives** page, you can delete, copy, open, or rename a creative. Select the creative from the list and choose the appropriate action.

From a creative, you can complete these actions:

- Navigate to the **Orchestration** ⇨ **Usage** tab to see which items, such as tasks or activities, use the creative.

  To open an item, click the item. To view item details and to open the item, click $\boxed{i}$ in the item’s row.

  Note: HTML assets are not listed.
- Navigate to the **Properties** tab to specify information about the creative, such as a description and type. In the **Custom** properties section, enter or view information for your custom properties. For more information, see “Define Custom Properties” on page 143.

Personalize Creatives

You can add one or more creatives to a message and personalize the creatives for different subsets of the target audience.

In an email task, add a content block, select a message with multiple creatives, and then specify personalization criteria for each creative to define which creative is delivered to each subset. For example, to personalize content by gender, add a creative that contains men’s apparel for male recipients, women’s apparel for female recipients. For more information, see “Add a Content Block” on page 580.

Note: If you add creatives to a content block, and if you specify a call-to-action link for the content block, the HTML for the creatives within the content block must not contain any nested hyperlinks. You must specify a single call-to-action URL for the content block as a whole, or for each creative in the content block. If you specify the call-to-action link for the content block and for the creatives, the HTML that is generated does not conform to the standards of the World Wide Web Consortium (W3C).

End Creatives

Select **End** if you do not want a creative to be published. This action changes the status of the creative to Completed and the creative cannot be included in a task. Only a creative that is not currently in use by a task can be completed. Ending an item stops any associated data collection and makes the item's content unavailable. In addition, any unsaved changes to the creative are lost.

Creating Email Messages

Messages give you a way to organize creatives by grouping them together, regardless of the channel for which the creatives are designed. If you are creating a message for an email task, be sure to add creative types that can be used in email tasks. The following types of creatives are supported for the email channel:

- HTML creatives
- imported assets

In an email task, a message is contained within a content block that you add to your email layout. You can create a message to group multiple creatives, and then add the message to a content block. A message can contain one or more creatives.

Note: A message and its creatives can be added to an email task only after the message is marked ready or is published.

For more information about creating and using messages in an email task, see the following documentation:

- For information about creating messages, see Chapter 35, “Creating Messages,” on page 437.
- For information about building creatives, see “ Creating Email Creatives” on page 554.
- For information about how to personalize a creative, see “Add a Content Block” on page 580.

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Working with Email Tasks

About Email Tasks

An email task contains all the information and items that you need to deliver email content to a target audience. Navigate through the tabs that are available in a task to edit, personalize, and deliver the email content. An email task also collects data about how recipients interact with the content. This data enables you to monitor the effectiveness of the content. Depending on your marketing objectives, you can select bulk delivery type to deliver messages at the same time to a larger target audience. Or, you can select triggered delivery type to deliver messages based on individual customer behavior.

You can open any task by navigating to  **Tasks** from the navigation bar.

You can access the items that a task uses and information about the task by navigating through the different tabs:

- The **Content** tab contains items that relate to the content that your task delivers. These items include any combination of creatives and HTML text, which are delivered through email.

- The **Header** tab contains email header information and personalization fields. It includes the subject line of the email, the email addresses of the recipients, and the sender information.
- The **Review** tab contains content testing features that enable you to preview how your content is displayed on multiple devices, browsers, email clients, and platforms. You can also run a spam test to check if your email content will be flagged as spam.
- The **Targeting** tab contains details about your target audience and the criteria that make up the target audience. You can specify who to include in your target audience by adding criteria to existing segments.
- The **Orchestration** tab contains the schedule of the task.

  Click **Delivery** to select the send agent that is used to deliver email content for this task.

  Click **Trigger** to add a trigger event, if you selected a triggered task.

  Click **Usage** to see which objects use a task. There is a list of items that the task uses, such as assets, messages, creatives, or segments. There is also a list of items that use the task. For example, if an activity includes this task, the activity is displayed in the list. From this tab, you can see the items your task depends on to work successfully.

  To open an item, click the item. To view item details and to open the item, click i in the item's row.

  Note: HTML assets are not listed.
- The **Insights** tab displays information about the effectiveness of the email, depending on the metrics that you set for your task.

When you create a task, it has a Designing status, which indicates that the task is still being worked on and is not ready to be published. When you finish working on your task, you can either mark it ready to be published, or you can publish it. Before you can successfully publish a task, any items included in that task must have a Ready status or an Active status. A task cannot be published if it contains items that have a Designing status or a Completed status. The items that your task depends on might include assets, events, segments, or creatives.

Tasks can be published on their own or included as part of an activity. An activity enables you to create and orchestrate your interactions with customers in real time by using tasks and conditions. When the task that you are creating is part of a larger plan for customer interaction, include that task in an activity. Tasks that are created from the Tasks interface can be added to an activity map after they have been created. However, a task cannot be added to an activity map after the task has been published. Active and Completed tasks cannot be included in an activity. For more information, see "About Activities" on page 745.

Creating an Email Task

1. From the navigation bar, click **Tasks**.
2. Click and select **Email** to deliver content through the email channel.

3 You can determine whether the task delivers all content at the same time or when event conditions are met. Select a delivery type to specify how the task delivers content:

- Click **Bulk** to deliver messages at the same time. You specify the schedule on the **Orchestration** tab. A bulk task can be used as the Start task in an activity.

  For more information, see "Scheduling a Task" on page 594.

- Click **Triggered** to add a trigger event. You can add a trigger event on the **Trigger** page on the **Orchestration** tab. You can also specify criteria and values to add attribute conditions for the event. Content is delivered when all of the conditions are met.

  For more information, see "Adding a Trigger" on page 597.

4 Select one of these methods to build your layout. An email layout contains text, images, creatives, and HTML content.

- Select **Design your own layout** to build a new layout.
- Select **Use saved layout** to use an existing layout in HTML format.

5 To use a saved layout, select a layout. Click **Done**, and then click **Create Task**. A new task is created.

Adding Content to a Task

Manage Your Content

Select and Edit Content

All the content that your task delivers in an email is specified on the **Content** tab. Email content includes the layout, message, and creatives that you want to deliver in an email task. You can use drag-and-drop operations to create your own layout, add content elements, and move the existing content elements. You can use the HTML or the plain text format, or both to customize and modify your layout. You can also include a message that contains one or more creatives.

On the **Content** tab, use these icons to manage your content:

- Click to display the Layout pane. In the Layout pane, you can complete these actions:
  - Select a check box for the content type from these options: **HTML** or **Plain Text**.

    To send emails that include both HTML and plain text content types, select both check boxes.

    Next, click a content type to select it. Based on the content type that you select, the relevant Edit buttons are displayed. Click an Edit button to open an editor window:

- Click **Edit Content** to open a drag-and-drop editor.
- Click **Edit HTML Code** to open an HTML editor.
- Click **Edit Plain Text** to open a plain text editor.

  Note: To meet legal requirements, you must provide a valid option for recipients to unsubscribe from receiving further emails.

CAUTION! Do not switch the format from HTML to plain text, or vice versa. If you select either HTML or plain text, you must consistently use the selected content type to add and edit the content for an email task. If you switch the format from HTML to plain text, or vice versa, your previous content is lost. This warning does not apply if you select both HTML and plain text.

- Click to select a saved template. Click **Save as Template** to save a layout as a reusable template.
- Click to view the number of content blocks in the email content.
- Click to display the Content Selection pane. In the Content Selection pane, click **Select Content** . You can either choose to add an existing message or creative, or you can click **New Message** or **New Creative** to create a message or creative. The message or creative that you create is automatically added to the task. If you selected a message with more than one creative, in the **Select Creatives** section, select the creatives that the task displays.

  Note: is enabled when you add a content block to the layout. For more information, see "Add a Content Block" on page 580.
- Click to display the Personalization pane. If the content block contains more than one creative, you can set rules to personalize each creative for a subset of the target audience.

  Note: is enabled when you add a content block that contains more than one creative.

Set Impression Limits

You can set impression limits to limit the number of times that users receive email content when an email task is triggered in response to multiple event occurrences in an activity.

Note: The system does not support the use of a static email address in the To field of the email header. Instead, you must insert a merge tag.

To limit the number of times an email is sent to a user, click to display the **Impression Limits** tab.

- Select **Limit total impressions per user** to specify the total number of email impressions that a user receives. This limit is valid for the duration of this task.
- Select **Limit impressions per user by period** ⇨ **Maximum impressions** to specify the maximum number of email impressions that a user receives.
- Select **Limit impressions per user by period** ⇨ **Time period** to specify the maximum number of email impressions that a user receives during a specified time interval (for example, minutes, hours, days, or months).

If you edit and republish an existing, bulk-type email task, or a triggered-type email task, then the impression limit that you specified is reset.

Note: If an impression limit is set for a task that is included in an activity, when the task is triggered, an email is sent to a user only if the count of previously sent emails is less than or equal to the impression limit that you set.

Edit Content in the HTML Editor

You have the option to modify and customize your email content by using the HTML editing capabilities in an email task. Complete these actions:

1 In the **Layout** pane, select the check box for the **HTML** content type.

> **TIP** To send emails that include both HTML and plain text content types, select both check boxes.

2 Click the **HTML** content type to select it. Based on the content type that you select, the relevant Edit buttons are displayed.

3 Click **Edit HTML Code** to open an HTML editor.

4 In the **Edit HTML Code** window, click in the **HTML Editor** to edit the email.

CAUTION! Do not switch the format from HTML to plain text, or vice versa. If you select HTML or plain text, you must consistently use the selected content type to add and edit the content for an email task. If you switch the format from HTML to plain text, or vice versa, your previous content is lost. This warning does not apply if you select both HTML and plain text.

Use these icons to add and edit HTML code:

Table 46.1 HTML Editor Icons

Icon	Usage
	Undo and redo.
	Find and replace.
	Insert a content block.
	Insert a merge tag.
	Drag to resize the preview pane.

Click **Update Preview** to preview your changes or to refresh the preview. Click **Done** to implement your changes and exit the window.

Note: You cannot preview your changes after you exit the window.

Edit Content in the Plain Text Editor

You have the option to modify and customize your email content by using the plain text editing capabilities in an email task. For help with setting up the plain text editor, contact your SAS technical consultant.

Complete these actions:

1 In the **Layout** pane, select the check box for the **Plain Text** content type.

> **TIP** To send emails that include both HTML and plain text content types, select both check boxes.

2 Click the **Plain Text** content type to select it. Based on the content type that you select, the relevant Edit buttons are displayed.

3 Click **Edit Plain Text** to open a plain text editor.

4 In the **Edit Text Content** window, enter your plain text email content.

CAUTION! Do not switch the format from HTML to plain text, or vice versa. If you select HTML or plain text, you must consistently use the selected content type to add and edit the content for an email task. If you switch the format from HTML to plain text, or vice versa, your previous content is lost. This warning does not apply if you select both HTML and plain text.

Use these icons to add and edit plain text:

Table 46.2 Plain Text Editor Icons

Icon	Usage
↶ ↷	Undo and redo.
	Find and replace.
	Insert a merge tag.

Note: By default, link tracking is not enabled for plain text emails. The links do not change.

To enable short links in plain text emails, you must set up a DNS record (CNAME) to define the tracking domain and configure the tenant correctly. For help with setting up the plain text editor, contact your SAS technical consultant.

You can add Unicode characters, which use the UTF-8 encoding standards by default.

To specify a different message encoding, from the navigation bar click **General Settings** and select **Content Delivery** ⇨ **Email** . In the **Properties** field, specify a value for the property `message encoding`.

If the value for the `property message encoding` is set to blank, then UTF-8 encoding is used. If the value for the property is other than UTF-8 or blank, the email content uses that encoding. A content header is inserted in the email content, which specifies that character set.

Edit Content in the Layout Manager

You have the option to modify and customize your email content by using the drag-and-drop editing capabilities in an email task. Complete these actions:

1 In the **Layout** pane, select the check box for the **HTML** content type.

> **TIP** To send emails that include both HTML and plain text content types, select both check boxes.

2 Click the **HTML** content type to select it. Based on the content type that you select, the relevant Edit buttons are displayed.

3 Click **Edit Content** to open a drag-and-drop editor.

4 In the **Layout Manager** window, you can add or edit these types of email content:

- Multiple Columns
- Text
- Image
- Button
- Horizontal Line
- Content Block
- View-on-Web Text
- Opt-out Text

You can preview how your email content is displayed on multiple devices. To preview the content, click **Responsive Previews**.

On the **Responsive Previews** page, you can resize or preview the email content.

- Click ⠿ and drag to resize the preview pane and preview how the content renders at different screen widths.
- Click to preview how the content renders on a mobile screen; click to preview how the content renders on a tablet screen; and click to preview how the content renders on a desktop screen.

If you added content, to save your content changes and continue working in the Layout Manager, click ⋮ and select **Save Task**. To exit the Layout Manager, click **OK**.

Duplicate Content in the Layout Manager

You can duplicate each block (for example, an image block, a multi-column block, or a button block) in the email content using the Layout Manager. All the properties for each component such as font, color, and alignment are duplicated. The conditional syntax that is added in the text block and image block is also duplicated.

1. Select the content that you want to duplicate.
2. Click «, and then select.

A duplicate of the selected content is created. Use a drag-and-drop operation to rearrange the content. To exit the Layout Manager, click **OK**.

Set Preview Text

You can set the text that is displayed with the subject of an email message. Enter text in the **Preview text** field, in the **General Layout Settings** pane.

The General Layout Settings pane is displayed when the layout is in zero state, or when you have not selected any content element in the existing layout.

Preview text is displayed in your recipient's inbox. If you do not add the preview text, the beginning of your email body text is displayed as the default preview. The number of characters that are displayed depends on the email client.

Click to add a merge tag to the preview text.

For more information, see "Add a Merge Tag to Personalize Text".

Specify a Background Color for the Layout

You can specify a background color for the layout to align to the color scheme of your organization or to a seasonal event. In the **Layout Manager**, specify **Layout Background Color** in the **General Layout Settings** pane. Click the color swatch and select from the **Basic** or **Custom** colors.

Note: The General Layout Settings pane is displayed when the layout is in zero state, or when you have not selected any content element in the existing layout.

Specify Default Settings for Text Formatting

You can set defaults for text formatting so that each time you add a Text block, you do not need to format it. In the **Layout Manager**, specify **Default Text Settings** in the **General Layout Settings** pane.

The General Layout Settings pane is displayed when the layout is in zero state, or when you have not selected any content element in the existing layout.

Use the icons to select default styles for text formatting, and then click ⋮ and select **Save Task**. The saved default settings are retained for the task and automatically apply to all of the new custom text that you add to the task. To override default text settings, select the text and use the **Text Settings** pane to format the text.

Add a Multiple Columns Block

A multiple columns block is a container into which you can drag any of the content elements from the Layout Gallery, except another multiple columns block. Use a drag-and-drop operation to move a multiple columns block onto the page and add content elements. When you add a multiple columns block, you select the number of columns that you want in the **Select Multiple Columns** window.

To add content to a column in a multiple columns block, drag a content element from the Layout Gallery to the page. Select each content element that you inserted in the multiple columns block to view and edit settings.

Note: In a multiple columns block, if you add content blocks, the **Layout Manager** displays thumbnail renditions of the assets from the creatives. If a thumbnail rendition occupies all the space available in the column, you might not get an accurate preview if you make changes to the size or alignment settings in the column.

Use drag-and-drop operations to move the content elements within the multiple columns block. However, you cannot drag the inserted content elements out of the multiple columns block, or vice versa.

Note: If you add a content block in a column, resize the assets that you use for the creatives to prevent overlapping or truncation.

Use the **Multiple Columns Settings** pane to customize the multiple columns block:

- **Number of columns** indicates the number of columns to which you can drag content elements from the Layout Gallery.
- If you added a multiple columns block with two columns, you can use the sliders to adjust the column width before you add content. Alternatively, enter a percentage for the column width in the **%** field.

  Note: You cannot change the width of the column after you add content to the column.
- Click the color swatch next to **Background color** and select from the **Basic** or **Custom** colors.
- To add spaces to the left and right of the Multiple Columns block, enter a value in the **Horizontal** field.

  Note: The valid range of the horizontal space is from 6 to 35. The horizontal space must be set in this range for the content to show correctly in all email clients.

  You cannot change the horizontal spacing after you add content to the column.
- To add white space to the top and bottom, enter values in the **Top** and **Bottom** fields.
- Edit additional settings:
  - In the **Display conditions** field, add conditional settings to specify which users see the selected content element. Click and select one of these options:

- To display the content element to all users, select **No conditions. Display the content element for all users.**
- To display the content element for specific users, select **Display the content element for users that match the conditions.**
- To hide the content element for specific users, select **Hide the content element for users that match the conditions.**

To add one or more conditions, click + and select a merge tag. Next, select an operator, and then specify a value. Enter the text to be inserted if the condition is true. Enter the default text to be inserted if the condition is false or if data is missing.

Conditions are evaluated in the order in which they appear, and the specified text is inserted if a condition is met.

Note: Currently, date and time values are not supported.

- The value for the **CSS classes** field is populated by default, depending on the content element that you added. To add another CSS class, click in the **CSS classes** text box and enter a value. Use a space to separate multiple values of CSS classes.

Note: You can add conditions to the entire Multiple Columns block or you can add conditions to each content element that you include within a Multiple Columns block. However, you cannot add conditions to the entire Multiple Columns block and to each content element within a Multiple Columns block.

Position your mouse pointer over and « and click 🗑 to delete a multiple columns block.

Click ⠿ and use a drag-and-drop operation to move the Multiple Columns block to a different location on the layout. Click **Done** to implement the changes that you made in the Multiple Columns Block Settings pane.

Note: If you copy or move a content element with conditional display settings and place the element outside a Multiple Columns block, the settings are retained for the content element. If you copy or move a content element with conditional display settings into a Multiple Columns block, ensure that no conditional display settings are defined for the entire Multiple Columns block.

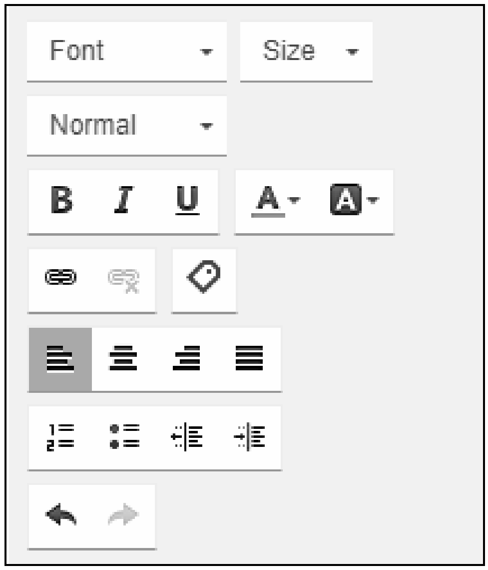
Add a Text Block

Add and Edit Text

Use a drag-and-drop operation to move a text block onto the layout. Click inside the text block to insert text. Modify the attributes of the selected text block in the Text Settings pane.

- Use the icons in the Text Settings pane to complete common text-editing tasks.

Figure 46.1 *Text Settings Pane*



- Edit design settings:
  - Click the color swatch next to **Background color** and select from the **Basic** or **Custom** colors.
  - To add white space on both sides of the text, enter values in the **Left** and **Right** fields.
  - To add white space at the top and bottom, enter values in the **Top** and **Bottom** fields.
- Edit additional settings:
  - In the **Display conditions** field, add conditional settings to specify which users see the selected content element. Click and select one of these options:
    - To display the content element to all users, select **No conditions. Display the content element for all users.**
    - To display the content element for specific users, select **Display the content element for users that match the conditions.**
    - To hide the content element for specific users, select **Hide the content element for users that match the conditions.**

    To add one or more conditions, click and select a merge tag. Next, select an operator, and then specify a value. Enter the text to be inserted if the condition is true. Enter the default text to be inserted if the condition is false or if data is missing.

    Conditions are evaluated in the order in which they appear, and the specified text is inserted if a condition is met.

    Note: Currently, date and time values are not supported.
  - The value for the **CSS classes** field is populated by default, depending on the content element that you added. To add another CSS class, click in the **CSS classes** text box and enter a value. Use a space to separate multiple values of CSS classes.

Position your mouse pointer over and and click to delete a text block.

Click ⠿ and use a drag-and-drop operation to move the text block to a different location on the layout. Click **Done** to implement the changes that you made in the Text Settings pane.

Add a Hyperlink

A hyperlink directs recipients to a web page that displays content.

1 Use a drag-and-drop operation to move a text block onto the layout.

2 Enter text. For example:

`To view product details, click here.`

3 Select the word or words that you want to hyperlink. In this example, select the word **`here`**.

4 In the **Text Settings** pane, click 🔗.

5 In the **Link** window, the **Link Info** tab is displayed by default.

6 In the **Link Type** field, make sure that the **URL** option is selected from the drop-down list. In the **Protocol** field, make sure that the **http://** option is selected from the drop-down list.

Note: Select **<other>** as the protocol if you are using merge tags in the URL. For more information, see Step 10 on page 571 .

7 In the **URL** field, enter the URL for the web page that you want to direct your recipients to.

Note: Be sure to specify a link domain that is publicly available over the internet.

8 To prevent the underline of link text, click the **Advanced** tab, and in the **Style** box, add this style property:

```
text-decoration:none;
```

To prevent change of text color when the link is clicked, in the Layout Manager, click **Edit Styles and Preview**. In the CSS editor, in the section for desktop styles, add these styles:

```
a:visited {color:black}
```

```
a {text-decoration: none}
```

9 To append additional data to a call-to-action URL, you can add a static variable, such as a product code. You can also append dynamic data to the URL by adding a merge tag to the URL, as shown here:

```
https://www.sas.com/en_us/home.html?value=%%datahub.customer.first_name%%
```

When the merge tag is resolved, here is the URL that the recipient Kim might see:

```
https://www.sas.com/en_us/home.html?value=Kim
```

10 You can insert a static call-to-action URL for each recipient, or you can insert a personalized call-to-action URL by using merge tags. To personalize the URL, in the **Protocol** field, make sure that the **<other>** option is selected from the drop-down list. In the URL field, enter the merge tag string and the URL, as shown here:

```
%%Datahub.customer.personalized URL%%
```

When the merge tags resolve, here is an example of the URL that the recipient Kim might see:

```
https://www.sas.com/en_us/solutions/risk-management.html
```

And here is an example of the URL that the recipient Kate might see:

```
https://www.sas.com/en_us/software/studio.html
```

11 Click **OK**. The word `here` now contains a hyperlink. When the link is clicked, it loads the web page URL that you specified in your default browser.

Add a Merge Tag to Personalize Text

A merge tag enables you to insert a data item from the customer data or behavioral data. When the message is delivered, the merge tag is resolved to personalized information about each recipient that is retrieved from the data hub and inserted as a value.

Before you can select a merge tag to personalize content, the table that contains the customer information for that merge tag must be imported into the system. For information about importing external customer data, see Importing and Exporting Identity Data.

For more information about merge tags, see “Adding Personalized Information to Creatives” on page 447.

1 In the text block, position your cursor where you want to insert a merge tag. In the **Text Settings** pane, click .

2 In the **Select Merge Tag** window, select a merge tag.

   For more information, see “Select a Merge Tag” on page 573.

3 In the **Default** value field, define a default value for the merge tag and click **OK**.

   The merge tag that you inserted automatically retrieves data from the data source. Each email recipient views personalized content. Currently, the supported data sources for merge tags are data hub, system-generated data, and some events-related data. Merge tags are also available for selection from imported lists and transient tables.

   If the email task is used in an activity, merge tag sources only from the data hub are supported.

   Note: When you import data that is used for merge tags, be sure to set the isChannelContactInformation property to true in the data descriptor. For more information, see “Creating an Import Descriptor” on page 185.

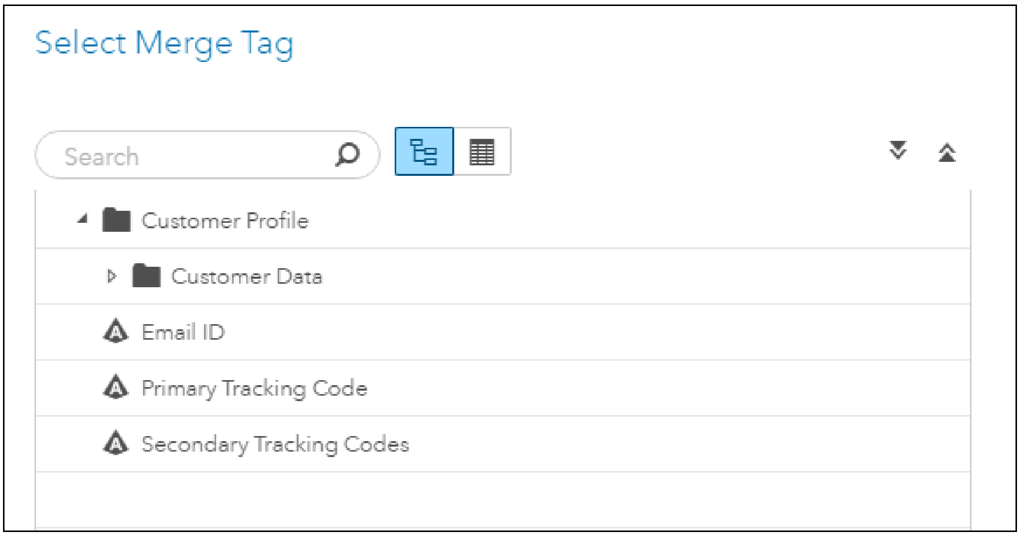
Note: If a customer record is removed or updated with an identity import, and that record is referred to in a merge tag, the merge tag value is not updated to reflect the record. To make sure that the merge tag is referring to an accurate record, take one of these actions:

- Delete the identity data on page 251.
- Import data for the customer, using the data hub ID, customer ID, or another known ID. In the CSV file, make all the entries blank in order to overwrite the values in the system. For more information, see Chapter 20, “Importing Data,” on page 185.

Select a Merge Tag

In the **Select Merge Tag** window, click to display a hierarchical folder view of merge tags. You can expand and collapse individual folders. Click to expand all of the folders. Click to collapse all of the folders.

Figure 46.2 *Select Merge Tag Window*



Click to display individual merge tags in alphabetical order.

On the **Targeting** tab, if you selected a set of recipients from a transient file, the attributes from the data are available for selection as merge tags for personalizing content on the **Content** tab or on the **Header** tab.

For a bulk email task, you can select from the merge tags that are listed in the Target File folder, which contains customer data from the selected target audience. In this case, the selected merge tag has the following syntax:

```
%%DATAHUB.TARGET.item_name%%
```

For a triggered email task, you can select from the merge tags that are listed in the Trigger Event folder, which contains event attributes data from the selected trigger event. In this case, the selected merge tag has the following syntax:

```
%%EVENT.TRIGGER.item_name%%
```

When you use data items from the customer data or trigger event data as merge tags for content personalization, you can save the content as a template. To reuse the content for a new target audience, use the saved template and select a new target audience (from the customer data or from the trigger event data) on the **Targeting** tab. For the merge tags to resolve correctly, ensure that the data items in the newly selected target audience folder match the data items from the original target audience folder. If the data items do not match, a warning is displayed.

Specify How to Insert Merge Tag Values

In the **Select Merge Tag** window, a merge tag that you select can resolve to a regular text value or a conditional text value for each recipient. Select a merge tag and select one of these options:

- Select **Insert text from a merge tag value** to insert a regular text value. For example, you select the merge tag, “Customer Name”.
- Select **Specify a condition based on a merge tag value** to specify a conditional text value. For example, you select the merge tag, “Customer Gender” and specify a basic condition, “if **Merge tag value** = *Female*, then **Text** = *Dear Madam*”.

In the **Default value** field, add a value. The merge tag inserts the default value if the customer data is missing, or if the condition that you specified is not satisfied.

Enter Merge Tag Syntax Manually

You can manually enter the merge tag syntax:

```
%%<source>.<category>.<name>%%
```

In the merge tag syntax, `source` represents the data source, `category` is the data group, and `name` is the field name of the data item.

If you manually enter a merge tag, you can insert **| |** after `name` and specify a default value within the syntax:

```
%%<source>.<category>.<name>||<default value>%%
```

By default, automatic number formatting is applied to numbers. A string, such as a postal code, is displayed as `25,678` instead of `25678`. To override automatic number formatting, insert `$` after `%%` :

```
%%$<source>.<category>.<name>%%
```

In this example, automatic number formatting is overridden for a postal code:

```
%%$DATAHUB.customer.zip%%
```

Add Conditional Merge Tags

A conditional merge tag enables you to build a condition, which combines text and merge tags. Based on the condition that you specify, for each person, the merge tags are replaced with text data values. The text data values are retrieved from the data hub. You can build a condition based on the selected merge tag values by using common operators to specify conditional text. You can also manually add merge tag syntax to build a condition. Conditional merge tags use @@ symbols to delimit the tag. The `{{ }}` symbols are used to include a complex chain of tags that combines multiple merge tag conditions. The operators =, <, >, <>, >=, and <= are used to build conditions.

To add a conditional merge tag:

1 Position your cursor where you want to insert a merge tag and click .

2 In the **Select Merge Tag** window, select a merge tag, select **Specify a condition based on a merge tag value** and click .

3 In the **Specify Conditions** window, specify a merge tag condition:

   - In the **Merge tag value** field, select an operator and specify a value in the user entry box.
   - In the **Text** field, enter the text that you want to insert based on the selected merge tag value.

- (Optional) Click **+** to specify additional conditions based on multiple merge tag values.
- In the **Select Merge tag** window, it is recommended that you add a default value.

The syntax for the conditional merge tag is displayed under **Merge Tag String**.

Note: If you add a conditional merge tag and exit the **Select Merge Tag** window, you cannot edit the merge tag syntax by reopening the **Select Merge Tag** window. You must manually edit the merge tag syntax, or delete the existing merge tag and add a new one in the **Select Merge Tag** window.

Examples of Merge Tag Conditions

You can add conditional merge tags based on the following examples:

Add a Simple Condition

For example, content that is delivered to men (where `gender=M`) must contain the greeting “Dear Sir”. If the value of the data item `gender` is missing, or if the value of the data item is other than `M` the content must contain the greeting “Dear Customer”.

You select the merge tag “Gender” and specify the condition:

Merge tag value =**`M`**, then Text =**`Dear Sir`**

Click **OK** and specify the **Default value** as **`Dear Customer`**

Merge tag syntax:

```
{{@@DATAHUB.customer.gender=M##Dear Sir@@||Dear Customer}}
```

The text after the ## symbol is the value that is inserted if the condition is true. In the conditional merge tag syntax, `DATAHUB` represents the data source, `customer` represents the data group, and `gender` is the field name of the data item.

Add Multiple Conditions

For example, the content that is viewed by men (where `gender=M`) must contain the greeting “Dear Sir”, and the content that is viewed by women (where `gender=F`) must contain the greeting “Dear Madam”. If both conditions are false, the greeting “Dear Customer” must be inserted.

You select the merge tag “Gender” and specify the following conditions:

Merge tag value =**`M`**, then Text =**`Dear Sir`**

Merge tag value =**`F`**, then Text =**`Dear Madam`**

Click **OK** and specify the **Default value** as **`Dear Customer`**

Merge tag syntax:

```
{{@@DATAHUB.customer.gender=M##Dear Sir@@@@DATAHUB.customer.gender=F##Dear Madam@@||Dear Custom
```

The text after the ## symbol is the value that is inserted if the condition is true. The text after the || symbol is the value that is inserted if the condition is false.

Merge tag conditions inside a chain can provide values for both true and false outcomes. The chain of merge tag conditions is evaluated from left to right and from top to bottom. If one of the merge tag conditions inserts text, evaluation of the remaining chain is ended.

Add a Condition for Missing Data Values

You can add a merge tag condition for missing data values.

For example, the `Age` value for some people is missing in the database. For these people, the text "We do not know how old you are, but we bet you are young at heart!" must be inserted.

You select the merge tag "Age" and specify the following condition:

Merge tag value =**.**, then Text =**We do not know how old you are, but we bet you are young at heart!**

Merge tag syntax:

```
{{@@DATAHUB.customer.age=.##We do not know how old you are, but we bet you are young at heart!@
```

Include Regular Merge Tags in Conditional Text

You can include a regular merge tag with a conditional merge tag to create a chain of tags.

For example, if the `Age` value for some people is missing in the database, the text "We do not know how old you are, but we bet you are young at heart!" must be inserted. If the age values are available in the database, the text, "Isn't it great being <value> years of age!" is inserted by the regular merge tag.

You select the merge tag "Age" and specify the following condition:

Merge tag value =**.**, then Text =**We do not know how old you are, but we bet you are young at heart!**

Merge tag value <>**.**, then Text =**Isn't it great being %%datahub.customer.age%% years of age!**

Merge tag syntax:

```
{{@@DATAHUB.customer.age=.##We do not know how old you are, but we bet you are young at heart!@
@@DATAHUB.customer.age<>.##Isn't it great being %%DATAHUB.customer.age%% years of age!@@}}
```

Add an Image

Use a drag-and-drop operation to move an image block onto the layout. In the **Image Settings** pane, click to select an image.

In the **Select Image** window:

- Select **From Assets** and click to select a static image from the Assets repository in SAS Customer Intelligence 360.

  (Optional) To specify the image source, click the **Content source** drop-down list and select an option:

  - Select **SAS Digital Asset Management** to add assets from the internal repository in SAS Customer Intelligence 360. This option is selected by default.
  - Select **Third Party CMS** to add assets from an external content management system (CMS) that is integrated with SAS Customer Intelligence 360.

For information about integrating content management systems with SAS Customer Intelligence 360, see Chapter 63, “Integrating with Content Management Systems,” on page 829.

Only assets that are enabled for sharing with external users are available for selection from SAS Digital Asset Management.

When you select an image, the URL in the email content refers to the location of the image that is published on the external content delivery server.

For more information about external sharing of assets, see “Share Assets Externally” on page 431.

- Select **From URL** and enter a URL, or click and select a merge tag that resolves to a personalized image URL based on recipient data. You can select a merge tag from data tables in the data hub or from event attributes.

  You can add a merge tag to insert a value for the whole URL, or a part of the URL.

  For more information, see “Select a Merge Tag” on page 573.

  Note: Ensure that the image URL is correct and accessible when the email is delivered. The URL must be acceptable to the application server that hosts the content at the desired location.

  It is recommended that you add a default image URL in the **Select Merge Tag** window.

  Note: When a task has a Design status, URLs that use merge tags might not be fully resolved to the site or content that they represent. The Layout Manager displays a place-holder image. You can modify the image attributes but you cannot preview the actual image. However, you can save and publish the task in this state.

Modify the attributes of the selected image in the **Image Settings** pane.

- To change or replace a selected image, click .
- To link to a website, click in the **Call-to-action link** field and insert a URL. For more information about appending data to a URL and personalizing a URL, see “Add a Hyperlink ” on page 571.
- To select an alignment setting, click the **Align** drop-down list.
- Edit design settings:
  - Click the color swatch next to **Background color** and select from the **Basic** or **Custom** colors.
  - Click the **Border** drop-down list and the color swatch next to **Border color** to select border design attributes.
  - Click in the **Width** field and enter a value to resize the width.

    Note:

    When you use a merge tag to insert an image, you cannot view the actual image because it is unresolved. Enter a value only for the **Width** field. The **Height** field is populated based on the aspect ratio of the actual image.
  - To add white space on both sides, enter values in the **Left** and **Right** fields.
  - Click in the **Height** field and enter a value to resize the height.
  - To add white space at the top and bottom, enter values in the **Top** and **Bottom** fields.

- Select the **Auto-fit** check box to automatically maintain the aspect ratio of your image. For example, if you modify the width of the image, the height and the other dimensions change correspondingly.

- Edit additional settings:

  - In the **Display conditions** field, add conditional settings to specify which users see the selected content element. Click and select one of these options:

    - To display the content element to all users, select **No conditions. Display the content element for all users.**
    - To display the content element for specific users, select **Display the content element for users that match the conditions.**
    - To hide the content element for specific users, select **Hide the content element for users that match the conditions.**

    To add one or more conditions, click and select a merge tag. Next, select an operator, and then specify a value. Enter the text to be inserted if the condition is true. Enter the default text to be inserted if the condition is false or if data is missing.

    Conditions are evaluated in the order in which they appear, and the specified text is inserted if a condition is met.

    Note: Currently, date and time values are not supported.

  - The value for the **CSS classes** field is populated by default, depending on the content element that you added. To add another CSS class, click in the **CSS classes** text box and enter a value. Use a space to separate multiple values of CSS classes.

Position your mouse pointer over and « and click to delete an image.

Click and use a drag-and-drop operation to move the image block to a different location on the layout. Click **Done** to implement the changes that you made in the Image Settings pane.

Add a Button

Use a drag-and-drop operation to move a button onto the layout. Edit and modify the attributes of the selected button in the Button Settings pane.

- To insert text, click in the **Button text** field. The button automatically resizes, depending on the length of your button text.
- To link to a website, click in the **Call-to-action link** field and insert a URL. For more information about appending data to a URL and personalizing a URL, see "Add a Hyperlink " on page 571.
- To select an alignment setting, click the **Align** drop-down list.
- Edit design settings:
  - Click the **Font** and **Font size** drop-down lists to change the text attributes.
  - Click the color swatches next to **Button color** and **Text color** to change the button design.

- Click the color swatch next to **Background color** and select from the **Basic** or **Custom** colors.
- Click in the **Width** field and enter a value to resize the width.
- To add white space on both sides, enter values in the **Left** and **Right** fields.

  As you insert text, the size of the button automatically increases, but the default value of the width does not change automatically.
- Click in the **Height** field and enter a value to resize the height.
- To add white space to the top and bottom, enter values in the **Top** and **Bottom** fields.
- Click the **Border** drop-down list and the color swatch next to **Border color** to select the border design for the button.
- Click in the **Corner radius** field and enter a value greater than 0 to define a rounded shape.

- Edit additional settings:
  - In the **Display conditions** field, add conditional settings to specify which users see the selected content element. Click and select one of these options:
    - To display the content element to all users, select **No conditions. Display the content element for all users.**
    - To display the content element for specific users, select **Display the content element for users that match the conditions.**
    - To hide the content element for specific users, select **Hide the content element for users that match the conditions.**

    To add one or more conditions, click and select a merge tag. Next, select an operator, and then specify a value. Enter the text to be inserted if the condition is true. Enter the default text to be inserted if the condition is false or if data is missing.

    Conditions are evaluated in the order in which they appear, and the specified text is inserted if a condition is met.

    Note: Currently, date and time values are not supported.
  - The value for the **CSS classes** field is populated by default, depending on the content element that you added. To add another CSS class, click in the **CSS classes** text box and enter a value. Use a space to separate multiple values of CSS classes.

Position your mouse pointer over and and click to delete a button.

Click and use a drag-and-drop operation to move the button to a different location on the layout. Click **Done** to implement the changes that you made in the Button Settings pane.

Add a Horizontal Line

Use a drag-and-drop operation to move a horizontal line onto the layout. Edit and modify the attributes of the selected horizontal line in the **Horizontal Line Settings** pane.

- To select an alignment setting, click the **Align** drop-down list.
- Edit design settings:
  - Click in the **Width** field and enter a value to resize the width.
  - Click in the **Thickness** field and enter a value for the line thickness.
  - Click the color swatch next to **Line color** and select from the **Basic** or **Custom** colors.
  - Click the **Style** drop-down menu and select an option for the line pattern.
  - Click the color swatch next to **Background color** and select from the **Basic** or **Custom** colors.
  - To add white space on both sides, enter values in the **Left** and **Right** fields.
  - To add white space to the top and bottom, enter values in the **Top** and **Bottom** fields.
- Edit additional settings:
  - In the **Display conditions** field, add conditional settings to specify which users see the selected content element. Click and select one of these options:
    - To display the content element to all users, select **No conditions. Display the content element for all users.**
    - To display the content element for specific users, select **Display the content element for users that match the conditions.**
    - To hide the content element for specific users, select **Hide the content element for users that match the conditions.**

    To add one or more conditions, click and select a merge tag. Next, select an operator, and then specify a value. Enter the text to be inserted if the condition is true. Enter the default text to be inserted if the condition is false or if data is missing.

    Conditions are evaluated in the order in which they appear, and the specified text is inserted if a condition is met.

    Note: Currently, date and time values are not supported.
  - The value for the **CSS classes** field is populated by default, depending on the content element that you added. To add another CSS class, click in the **CSS classes** text box and enter a value. Use a space to separate multiple values of CSS classes.

Position your mouse pointer over and ‹‹ and click to delete a horizontal line.

Click and use a drag-and-drop operation to move the horizontal line to a different location on the layout. Click **Done** to implement the changes that you made in the Horizontal Line Settings pane.

Add a Content Block

A content block is an area on the page layout that renders personalized content. Use a content block to display one or more creatives. Multiple creatives within a message can be personalized for different subsets of your target audience. You can add one or more content blocks to a layout.

Use a drag-and-drop operation to move a content block onto the layout. Modify the attributes of the selected content block in the **Content Block Settings** pane.

- To specify a name, click in the **Content block name** field.
- To link a creative to a website, click in the **Call-to-action link** field and specify a URL. If you specify a **Call-to-action link** for the content block, all of the elements on the creative are clickable and direct the recipient to the specified URL.

  For more information about appending data to a URL and personalizing a URL, see "Add a Hyperlink " on page 571.

  Note: If you specify a call-to-action link for the content block, the HTML for the creatives within the content block must not contain any nested hyperlinks. You must specify a single call-to-action URL for the content block as a whole, or for each creative in the content block. If you specify the call-to-action link for the content block and for the creatives, the HTML that is generated does not conform to the standards of the World Wide Web Consortium (W3C).
- To select a message with one or more creatives, click **Done** to exit the **Layout Manager**.
- If you added more than one content block, on the **Content** tab, click to display the Content Blocks pane. Select the content block that you want to select content for or personalize.
- Click to display the Content Selection pane. Click **Select Content** to select a message or a creative. If you selected a message with more than one creative, in the **Select creatives** section, select which creatives the task displays.

  For more information, see " Creating Email Messages" on page 557.

  > **TIP** Images in creatives might be truncated on some platforms, especially if there are multiple columns. Set the width of the image in the creative to fit the width of the column that contains it.

- If a content block contains more than one creative, click to open the **Personalization** tab and personalize each creative for a subset of the target audience.

  On the **Personalization** tab, Method specifies how a creative is displayed. The Rule-based method enables you to specify different targeting criteria for each creative in this task. By adding criteria to the creatives, you can send each creative to a different subset of the target audience.

  Note: If you added personalization criteria to a creative in a content block, do not reuse the personalized creative in another content block to ensure that personalized targeting is executed correctly.
- Click to add targeting criteria to the creatives. In the **Rule-based Settings: Content Block** window, set the priority for each creative.

  Note: In a content block, in the **Additional Settings** section, the conditional display capability is not supported, although this capability is available for other content elements. This is because you can use the personalized targeting capability and add conditional rules to display creatives in a content block.
- Select a creative and click to specify targeting criteria for the selected creative. Click to select criteria and specify a value. In the **Select Criteria** window, you can select a segment or you can select a data item from customer data and behavioral data folders. Specify a value and click **OK**. The selected

creative is delivered to the recipients from the target audience who satisfy the criteria that you specified. Click **Done**.

For example, for the first creative you select the data item “City” as the criterion and you specify the value, “London”. For the second creative you select the data item “City” as the criterion and specify the value “New York”. Recipients from the city of London will see the first creative, and recipients from the city of New York will see the second creative.

Each creative is assigned a number that indicates the order in which the creative's targeting criteria are evaluated. A creative with the number 1 is evaluated first. You can change the numbers by changing the position of the creative in the list. After a suitable creative is found for a user, that creative is delivered and the creatives that come after it are not evaluated. You do not have to add criteria to every creative. The first creative in the list that does not contain targeting criteria becomes the default creative for this task. Any creatives listed after the default creative are never delivered.

> **TIP** If you inserted a content block inside a multiple columns block, a recipient who does not meet any targeting criteria will receive an email message without a personalized creative. This might result in a blank space. To ensure proper design and that all users receive a creative, at the end of the list add a default creative that does not contain targeting criteria.

- To select an alignment setting, click the **Align** drop-down list.
- Edit design settings:
  - Click the **Border** drop-down list and the color swatch next to **Border color** to select the border design for the content block.
  - Click the color swatch next to **Background color** and select from the **Basic** or **Custom** colors.

    > **TIP** If the background color does not fill in the white space around your creative, adjust the values for the space fields until the white space is eliminated and the background color fills in.

  - To add white space on both sides, enter values in the **Left** and **Right** fields.
  - Click in the **Height** field and enter a value to resize the height.
  - To add white space to the top and bottom, enter values in the **Top** and **Bottom** fields.
  - In the Additional Settings section, the value for the **CSS classes** field is populated by default, depending on the content element that you added. To add another CSS class, click in the **CSS classes** text box and enter a value. Use a space to separate multiple values of CSS classes.

  Note: To prevent truncation of your creative, resize the digital asset that you use in the creative. Ensure that the asset dimensions do not exceed the dimensions of the content block.

Position your mouse pointer over and « and click 🗑 to delete a content block.

Click ⠿ and use a drag-and-drop operation to move the content block to a different location on the layout. Click **Done** to implement the changes that you made in the Content Block Settings pane.

Move Blocks between Columns of Different Widths

You can change the layout easily by moving blocks (for example, an image block, a text block, a content block, or a button block) from one column to another column, even if the columns have different widths. The ability to move blocks enables the user to change the layout without spending extra time re-creating the content.

Note: You can change the widths of the columns only for a two-column block.

To move any block from one column to another column of different width:

1. Select the content that you want to move.
2. Use a drag-and-drop operation to move the block to the desired column.

Note: All properties are preserved if blocks are moved to and from columns of the same width. If the column widths differ, any pixel-sized property would be reset as if the block had been added to the column for the first time. For example, if a picture with 100-pixel padding on both sides is moved to a 150-pixel width column, the padding would be cleared and reset to the default value.

Add View-on-Web Text

Add View-on-Web Text with a hyperlink that recipients can click to view email content in a web browser.

1. Use a drag-and-drop operation to add View-on-Web Text, which contains some default text with a hyperlink.

   For example: `To view this email in your web browser, click here.`

   In the example, the word `here` contains a hyperlink.

2. Click **View-on-Web Text** and use the icons in the **View-on-Web Text Settings** pane to edit, format, and customize the default text.

   For more information about editing text, see "Add and Edit Text" on page 569.

   Note: Recipients can see the View-on-Web Text only when the message is viewed in the email client. View-on-Web Text is not displayed when the message is viewed in the browser.

3. (Optional) If you replaced the default text, complete these actions to insert a text hyperlink that contains a view-on-web merge tag:

   a. Select the text that you want to hyperlink. For example, you select the word `email`.

   b. In the **View-on-Web Text Settings** pane, click .

   c. In the **Link** window, on the **Link Info** tab, click the **Protocol** drop-down list and select **<other>**.

   d. In the URL field, manually enter this merge tag syntax and click **OK**:

```
%%SYSTEM.EMAILMSG.web_view_url%%
```

The word **`email`** contains a view-on-web hyperlink. When the link is clicked, the merge tag enables recipients to view email content in their web browser.

Note: Email imprints that are sent by a task are stored on the cloud to fulfill view-on-the-web requests by recipients. To store imprints, the HTML content must contain the view-on-web merge tag. By default, the imprints are automatically deleted 90 days after the email task is run.

Add Opt-Out Text

By default, an email layout contains opt-out text. You can set up an unsubscribe option for email recipients by inserting a link in the opt-out text that directs recipients to a page on your website with a mechanism to unsubscribe. Select the **Opt-out Text** and use the icons in the **Opt-out Text Settings** pane to edit, format, and customize the default text. For more information about editing text, see "Add and Edit Text" on page 569. You can add one or more opt-out text blocks.

To meet legal requirements for email marketing, you must provide recipients with an option to unsubscribe from receiving further emails. Therefore, do not delete the opt-out text.

TIP You can also enable unsubscribe requests through email reply. For more information, see "Configure Unsubscribe Settings" on page 44.

Create Responsive Email Content

You can define custom styles for HTML elements to display variants of email content in response to the recipient's device. By using the media queries technique in the Cascading Style Sheet (CSS), add and edit styles and style properties for each content element that you add from the **Layout Gallery**:

1 In the **Layout Manager**, select the content that you added from the Layout Gallery. For example, if you added an image, select the image.

2 The Image Settings pane is displayed. In the Advanced Settings section, in the CSS classes text box, note that the **`image`** class is added by default. To add another CSS class, click in the **CSS classes** text box and enter a value. Use a space to separate multiple values of CSS classes.

3 To add or edit the style properties, deselect the image and click **Edit Styles**.

4 In the **Edit Styles and Preview** window, click in the CSS editor to add or edit the style properties. For example, for an image that is displayed on a handheld device, you might want to specify a different value for the width property. Alternatively, you might want to display a different image, depending on the screen size of the device.

   Note: Prior knowledge about HTML syntax and CSS styles is a prerequisite to use the CSS editor.

   The section below the editor contains code that you can view but not modify.

5 Click and drag to resize the preview pane and preview how the content renders at different screen widths.

6 To preview your changes, or to refresh the preview, click **Update Preview**.

7 Click to preview how the content renders on a mobile screen, click to preview how the content renders on a tablet screen, and click to preview how the content renders on a desktop screen.

8 Click **OK** to implement your changes and exit this window.

Note: You cannot preview your changes after you exit this window.

Save a Layout as a Reusable Template

If you have designed a new, custom layout, you can save it as a reusable template.

1 After you add content to your layout in the **Layout Manager**, click **Done**.

2 The layout is displayed on the **Content** tab. In the Layout pane, click **Save as Template**.

3 In the **Save as Template** window, specify a unique name, and then click **Save**.

The saved template is displayed in the **Current Template** field. This template is saved as an HTML asset.

Note: The saved template retains all the elements of the layout, except for the creatives.

The creatives are contained within the content blocks. The saved template also retains the conditional display settings for the content elements. If you reuse a template with conditional display settings, you cannot view the settings in the Layout Manager, but you can view and edit the settings in the HTML source.

4 To view the saved template, from the navigation bar click **Assets**.

Note: The template contains content elements that are arranged in a layout, which is saved for reuse. If you reuse an existing template and edit the HTML source code, you must insert the appropriate content element, per the saved layout.

Search for the saved template by entering the name in the search box.

Note: When you save an email template as an asset, the template can be used by another task. However, a task uses a copy of the email template, instead of the original file, which was saved as an asset. The original file is stored in **Assets**. Within a task, if you navigate to **Orchestration** ⇨ **Usage**, you cannot view the email template that is used by the task.

5 To replace or select a new template, on the **Content** tab, in the Layout pane, click .

In the warning message that is displayed, select one of these options:

- Click **Yes** to continue to select a template. On the **Asset Selection** page, select a template.

  Note: If you select a new template, it overwrites the existing layout.

- Click **No** to continue to use the layout that you modified.

  Note: You can use the layout that you created in the email task. However, any changes that you make to the layout are not saved to the template.

Defining Email Header Information

Specify Information for Email Header Fields

To send an email message to one or more recipients, on the **Header** tab, complete these fields:

Subject
: Enter a subject line for your email. You can select a merge tag to personalize this field.

To
: Specify the email address of your recipient. By default, the **To** field is populated with the special merge tag syntax, `%%email_contact%%`. It automatically retrieves the email addresses of your recipients from the data source. You can select a merge tag to add personalized details such as the recipient's first name.

  If you insert the `%%email_contact%%` merge tag in the **To** header field, the system retrieves the data from the customer table in the data hub. If email_contact is a tagged data item in the customer table, the `%%email_contact%%` merge tag will resolve to the values given in the customer table, that is, if you have not selected a transient file as the target segment for the task.

  If you have specified a transient file as the target segment for the task, the `%%email_contact%%` merge tag looks for the tagged data item, “email_contact” in the transient file. If that data value is not available, and the transient file has an identity data item in common with a customer table, the value of the data item, “email_contact” is inserted. Other data items from that customer table might also be inserted.

  Note: A static email address that is added in the **To** field does not resolve to recipient data, even if the static email address is listed in the customer data set. This is because the system cannot associate the static email address with a specific customer identity. A single email address might be used with several customer identities.

From
: Specify a name and email address that represent the sender of the message.

  Note: The send agent that is selected by default determines the values for the From and Reply-to fields. To add an alternative sender address, navigate to **Orchestration** ⇨ **Delivery**, and select another send agent from the drop-down menu.

  From the drop-down list, select an approved sender address or sender domain that is added for the send agent on the **New Send Agent** page. If you select an approved sender address, the **Display as** field shows the value that is specified for the send agent, for that address.

If you select an approved sender domain, you can specify the local part of the sender name in the user-entry box or select a merge tag for the local part. In the **Display as** field, you can specify a display name.

Reply To

Specify a name and email address to receive replies from recipients.

Note: The send agent that is selected by default determines the values for the From and Reply-to fields. To add an alternative reply-to address, navigate to **Orchestration** ⇨ **Delivery**, and select another send agent from the drop-down menu.

From the drop-down list, select an approved **Reply-to address** or **Reply-to domain** that is added for the send agent on the **New Send Agent** page. If you select a **Reply-to domain**, specify a name in the user-entry box. In the **Display as** field, you can specify a display name.

Alternatively, select **Specified address** from the drop-down list. In the user-entry box, specify a new **Reply-to address** for this task.

Personalize Email Header Fields

Use a Merge Tag

A merge tag enables you to insert a data item from the customer data or behavioral data. When the message is delivered, the merge tag is resolved to personalized information about each recipient that is retrieved from the data hub and inserted as a value.

Before you can select a merge tag to personalize content, the table that contains the customer information for that merge tag must be imported into the system. For information about importing external customer data, see Importing and Exporting Identity Data.

1 Click next to the field that you want to personalize.

2 In the **Select Merge Tag** window, select a merge tag.

   For more information, see “Select a Merge Tag” on page 573.

3 In the **Default** value field, define a default value for the merge tag and click **OK**.

   The merge tag that you inserted automatically retrieves data from the data source. Each email recipient views personalized content. Currently, the supported data sources for merge tags are data hub, system-generated data, and some events-related data. Merge tags are also available for selection from imported lists and transient tables.

   If the email task is used in an activity, merge tag sources only from the data hub are supported.

   Note: When you import data that is used for merge tags, be sure to set the isChannelContactInformation property to true in the data descriptor. For more information, see “Creating an Import Descriptor” on page 185.

Note: If a customer record is removed or updated with an identity import, and that record is referred to in a merge tag, the merge tag value is not updated to reflect the record. To make sure that the merge tag is referring to an accurate record, take one of these actions:

- Delete the identity data on page 251.
- Import data for the customer, using the data hub ID, customer ID, or another known ID. In the CSV file, make all the entries blank in order to overwrite the values in the system. For more information, see Chapter 20, “Importing Data,” on page 185.

Enter Merge Tag Syntax Manually

You can manually enter the merge tag syntax:

```
%%<source>.<category>.<name>%%
```

In the merge tag syntax, `source` represents the data source, `category` is the data group, and `name` is the field name of the data item.

If you manually enter a merge tag, you can insert | | after `name` and specify a default value within the syntax:

```
%%<source>.<category>.<name>||<default value>%%
```

By default, automatic number formatting is applied to numbers. A string, such as a postal code, is displayed as `25,678` instead of `25678`. To override automatic number formatting, insert `$` after `%%` :

```
%%$<source>.<category>.<name>%%
```

In this example, automatic number formatting is overridden for a postal code:

```
%%$DATAHUB.customer.zip%%
```

Previewing and Testing Email Content

On the **Review** tab, you can preview the content of an Email task. You can also test the spam score of the content.

Set Up the Task for Previewing and Testing

Before you run a preview or a spam test, ensure that the status of the task is Designing and that the task is not added to an activity. When a preview or spam test is run, the system runs a publish operation to generate the test content results for reviewers. The task temporarily displays a Publishing status and returns to the Designing status when the tests are complete.

Note: It is recommended that you not modify the task content or status, or refresh the task while the preview or spam test is running, and the test shows a Submitted status. Changes made to the task content during email preview or spam testing are not included in the review.

It is recommended that you complete all the actions for the task before you run a preview or spam test to review content. When a preview or spam test is run, the publish operation validates that you have completed all the actions for the task. Any incomplete actions for the task might be identified in the error messages that are displayed. For example, if you have not populated email header fields or you have not selected a target audience for your email, an error message indicates that you cannot mark ready or publish the task. This error message helps you understand the actions that you must complete before you publish the task for delivering emails to your customers.

Preview Responsive Email Content

You can preview how your email content is displayed on multiple devices. To preview the content, click **Responsive Previews**, and then click **Open**.

On the **Responsive Previews** page, you can resize or preview the email content.

- Click and drag to resize the preview pane and preview how the content renders at different screen widths.
- Click to preview how the content renders on a mobile screen; click to preview how the content renders on a tablet screen; and click to preview how the content renders on a desktop screen.

Preview Email Content

You can preview how your email content is displayed on multiple devices, browsers, email clients, and platforms. To preview the content, click **Multiple-Client Previews**, and then click **Run**.

When the test is complete, you can search the results for platform, client, or an application such as a browser. For example, you can enter `Web.de` in the **Search** field to find previews on the Web.de web client.

If you have content blocks in your email messages, the preview displays the default creatives. You can select an individual preview and expand it. Within the expanded preview, you can choose whether to view the creatives, suppress them, or view them as thumbnails.

The **Previews run** field displays the count of previews that were run.

Run a Spam Test

You can test whether your email content will be flagged as spam. To test the content, click **Spam Test**, and then click **Run**.

The **Spam tests run** field displays the count of spam tests that were run.

Preview and Test

To preview the email and run the spam test, click **Overview**, and then click **Run All**. To view the results, navigate to the **Preview Email** or **Spam Test** pages.

You can configure the time limit for the test to run. By default, the configured time duration for the test to run is five minutes. Tests that run beyond the configured time limit are terminated. For more information contact your SAS account manager.

The count of total tests run indicates the total number of previews and spam tests that were run from the **Review** tab, within the organization, by all of the users.

Defining a Target Audience

Add a Target Audience

On the **Targeting** tab, set the criteria that define the target audience for the content that the task delivers.

On the **Eligible** page, you can specify which people to include in your target audience. On the **Exclusions** page, you can specify which people to exclude from your target audience. The **Exclusions** page is not available for bulk tasks.

Note the following rules about defining the target audience:

- For triggered tasks, if no criteria are added, the target audience includes everyone. For bulk tasks, you can select only one criterion. If you do not select a criterion, no content is delivered.
- When you create a target audience using demographic criteria such as city, age, gender, membership status, and so on, only the users who satisfy criteria based on their current data are included in the target audience.
- Previously defined segments, events, and data views can be selected as criteria.

  Note: You must define a login event type if you have tasks that depend on segments with data from logged-in users.

  > **TIP** The attributes of the events or data views added to the targeting criteria can be selected as values for personalization variables by navigating to **Content** ⇨ **Personalization**. For more information about delivering personalized content, see “Personalizing HTML Creatives” on page 630.

- You can use customer lists that have been imported from other sources, such as SAS Marketing Automation.

To add criteria:

1. For triggered tasks, click **Eligible** or **Exclusions**.
2. Click ➕ to add a criteria row.
3. In the **Specify criteria** box, click .
4. In the **Select Criteria** window, select the criteria to add.

   To locate criteria, use these options:

   - Click to display a hierarchical folder view of criteria. Click to display individual merge tags in alphabetical order.

- Click to expand all of the folders. Click to collapse all of the folders.
- Click to view details, if available, about the criteria.
- Search for criteria by entering the name in the **Search** field. Select criteria and click to display details.

5 Click **OK**.

6 If applicable, in the **Specify values** box, click and specify a value for the criteria.

For example, if channel is your selected criterion, you might specify a value of mobile or web. Whereas, there is no need to specify a value if a segment is selected.

7 For triggered tasks, repeat steps 1-6 to add criteria.

8 Use these options to work with the criteria list:

- Click to view a summary of the criteria.
- For triggered tasks:
  - Click to make a copy of the criteria. Copying criteria saves steps when you use the same criteria but supply different values.
  - Click or to move criteria up or down in the list. The position determines the order in which the criteria are checked.
  - Click to create a group for a set of criteria. Groups enable you to nest criteria.
  - Click to delete criteria.

9 Select **All of the following** to include members who meet all of the criteria in a group. Or, select **Any of the following** to include members who meet one or more of the criteria in a group.

10 Click .

Target Audience Data and Personalization

Depending on the selected target audience for a bulk email task (customer data) or a triggered email task (trigger event data), data items from the recipient data in transient files are available for selection as merge tags for personalization.

For a bulk email task, you can select recipients from one of these sources:

- a segment that is created from existing customer data
- an imported list
- a transient file that contains data in temporary tables

Note: If you create a segment from existing customer data, make sure to add recipients only from one customer table. Combining two or more tables to create a segment might produce unexpected results, such as duplicate email contact items and other data issues.

For personalizing content, select from the merge tags that are listed in the Target File folder, which contains customer data from the selected target audience (in this case, the transient file). A selected merge tag has this syntax:

```
%%DATAHUB.TARGET.<data item>%%
```

Note: Customer Identities (subject IDs) that are contained in the transient file must already be mapped in the data hub before you use the transient file.

For more information, see “Select a Merge Tag” on page 573.

All email subscribers who meet the eligibility criteria receive emails if their subscriber data (for example, email address and device ID) is available from the database.

Setting Metrics

Metrics measure events that the system can detect. For example, the system can detect certain events such as a person clicking a spot on a web page. Add metrics to measure the success of the content being delivered by the task.

Set a Primary Metric

The primary metric measures conversions to determine the success of the task. There can be only one primary metric. You can either edit an existing primary metric or add a new one and then remove the previous metric.

1 Click **+**.

2 Select the criteria that you want to add. You can select an event view or a data view.

   For more information about events, see “User-Defined Events” on page 304. For more information about data views, see “About Data Views” on page 459.

3 If attributes are defined for the event or data view, select the attribute conditions that must be met. For example, for a Click Through metric, you can select a particular creative as an attribute condition. The primary metric would be a click-through response to that creative.

   Note: Attributes are joined by an AND operator. Make sure that you do not define conflicting attributes that result in a condition that cannot be met.

4 To mark this selection as a contact or response that can be tracked and used for reporting and future targeting, select **Classify this selection**. Classifying an event or data view enables you to compare contacts and responses across creatives and channels. You can personalize future messages and creatives. You can also use the information to segment customers. You can classify events and data views in both primary and secondary metrics.

   To record the number of times that a customer interacts with a creative or a spot, select **Mark this selection as a contact**. This information is available as contact history for SAS Marketing Automation, SAS Real-Time Decision Manager, and other applications.

To mark this selection as a response to a creative, select **Mark this selection as a response**.

Set Secondary Metrics

A secondary metric measures other benchmarks that you are interested in. A task can have multiple secondary metrics. Each secondary metric can have only one data view or event.

Click **Add Secondary Metric** to add a secondary metric.

Modify Existing Metrics

You can change the settings for an existing metric.

Note: The action icons for a metric are only visible when the metric has focus. For example, a metric has focus when you tab to it or when you move your mouse over the metric.

- Click to update the metric details.
- Click to remove a metric.

View Task Usage

View Usage Information

From the **Orchestration** ⇨ **Usage** tab, you can view which items use the task and the items that the task uses.

The ability to view dependencies between items enables you to see the items that a task depends on to work successfully. Usage information helps you identify how changes that you make to one item might affect another item.

Items That Use the Task

The first section shows the items that use the task. For example, if the task is used in an activity, the activity is included in the list.

The Channel, Priority, and Type columns do not apply to activities and are therefore empty.

Items That the Task Uses

The second section shows items that the task uses.

- Click **Directly Related** to list the items that the task uses. For example, if a task uses a creative, the creative is included in the list.
- Click **All Related** to view directly related items as well as any items that those directly related items use. For example, you might see the creative that the task uses and the asset that is used by the creative.

  The list displays items with a Designing, Ready, or Active status. Click **Show Designing Status only** to display only items with a Designing status.

To open an item, click the item. To view item details and to open the item, click i in the item's row.

Note: HTML assets that are the content source for mobile spot, web spot, and email creatives are not listed.

Scheduling a Task

Schedule and Start Your Task

When you finish updating your task, you can mark the task ready, publish the task immediately, or set a schedule for a task.

Note: When you schedule a bulk email task, a bulk mobile push notification task, or a direct marketing task, allow a minimum of five minutes between the time you publish the task and the scheduled start time for the task to be active. This time delay is needed by the system to process the request.

On the **Orchestration** tab, complete these actions:

- Click **No schedule** if you plan to publish the task manually.
- Click **Set a schedule** to set a time period that the task is active.
  - Select a time zone. For example, you might want to select a time zone that is different from the default if the task is targeted to a specific locale. By default, the time zone is the same as the time zone that is set for the tenant. If a valid time zone is not set for the tenant, the default time zone is UCT.
  - Click **Single occurrence** to specify a single time span that the task is active.
  - Select a start date and an end date for the task.

    Note: If you select **Single occurrence**, the start date cannot be edited after the task is published.
  - Click **Recurrence** to specify a recurring task. Click .

    Specify these details for a recurring schedule:

    - **Start time** is the start time for the first occurrence.
    - **Frequency** specifies that the schedule for the recurrence. If you click **Weekly**, click the day for each occurrence. You can select multiple days in each week. If you click **Monthly**, select the numbered day or the weekday for the recurrence. For example, you can select the 10th day of each month or the second Tuesday of each month.

Note:

You can edit the weekly or monthly frequency after the task is published and the start date has passed. The recurrence must occur within the start and end dates.

- **Range of recurrence** specifies the start and end dates, or that the recurrence continues without an end date.

- **Extend metrics analysis** continues collecting data after the last occurrence. Select the number of days to extend data collection. The default value is 7 days. For example, if you use the default value, and the **Start time** is 9:00 PM, data collection continues until 9:00 PM seven days after the **End by** date.

  Customers might respond several days after the last occurrence. You can extend the time for data collection in order to more effectively measure task performance.

  During the extended period of data collection, the status is Active - Metrics Only. The status changes to Complete when the **Extend metrics analysis** period is over.

- Select **Mark Ready** to change the status from Designing to Ready. A Ready status indicates that this item is ready to be published. When you are ready to promote an item from a Ready status to an Active status, click **Publish**.

  Note: When you publish an item, you are prompted to publish any dependent items that are marked Ready.

  Items with a Ready status can be changed back to a Designing status by clicking **Return to Designing**. Changing this status to Designing prevents the item from being published.

  Note: If your item has a Ready status and a start date, the item is not automatically published when the start date is reached. For example, if you are creating a task, it must be published in order for the start date to activate the task.

- Select **Mark Ready and Publish** to change the status from Designing to Active. Items with an Active status cannot be changed back to Designing.

Note: When an email task is published and has an Active status, the status does not indicate that delivery of emails to all recipients for the task to be complete. All emails are delivered after the sending process is complete.

Changes to a scheduled or active task are not automatically propagated to the published version of the task. You must republish the task after you save it to resolve the Out of Sync status. Otherwise, the task stays out of sync with the published version and the updates are not delivered.

If you republish an email task, the system does not create a new copy of the original task. Instead, the system overwrites the single, published copy of the task and delivers the latest version of the content. For example, if you republish a task with content blocks multiple times, recipients will receive multiple emails, which contain the latest updated version of the task content.

When the end date of a task is reached, its status changes to Complete. Completed tasks cannot be modified. The task stops any associated data collection and makes the task's content unavailable. In addition, any unsaved changes are lost.

Note: A recurring schedule is not available if the task is included in an activity.

(Optional) Add Task to an Activity

To publish the task as part of an activity, add it to an activity. When the task is published, the emails are delivered to the target audience that is defined by the activity. The status of the task changes to Active, and it collects data.

Note: Triggered emails are delivered only per the schedule that you set for the task to be Active. The schedule includes the single occurrence or recurrence settings. Emails are not delivered for any events that occur outside the task schedule.

Pause the Task

To pace the execution of email tasks based on time priorities or business needs, or to avoid an erroneous delivery of content, you can pause the delivery of an email task after the task is published and its status is **Active**. Click **Pause** on the **Orchestration** tab to pause the execution of the batch email process. When a task has a **Paused** status, the delivery of emails is halted.

Note: When a task has a **Paused** status, you cannot modify the task content. You can resume the task or end it.

To modify the task, click **End**. After you modify the task content, save it as new task, and then click **Republish** to make the task active again and to deliver the updated content.

To resume execution of the original task that was paused, click **Resume**. When you resume the task, it returns to its original state and continues to execute.

Note: If a triggered task is paused, it pauses the delivery of emails. When you resume the triggered task, it continues to deliver emails for trigger events that occurred when the task was paused. If you do not want to resume the delivery of triggered emails, click **End**.

End Task

While your task is running, it collects data and gathers information about progress toward your metrics. For more information, see “ Monitor Your Email Task” on page 599.

Navigate to the **Insights** tab to check the progress of your task.

Click **End** on the **Orchestration** tab when you no longer need the task to deliver emails or when the scheduled end date is reached. The status changes from Active to Complete. Completed tasks do not collect new data and cannot be modified. Any unsaved changes to the task are lost.

Note: If the task is scheduled and is ended before its start date, the task displays the status **Canceled**.

Adding a Trigger

To add a trigger event to a triggered task:

1. On the **Orchestration** tab, click **Trigger**.
2. Click and select an event.
3. Click +. Specify criteria and values to add attribute conditions for the event.

   The attributes that you add are based on the attributes that are associated with the original event. Attributes that you modify do not affect the attributes for the event itself. The attributes in this panel affect how the event is processed for this trigger only.

   The task delivers content when all of the attribute conditions are met.

Delivering Emails

Select a Send Agent

Before you select a send agent, create a send agent. For more information, see "Create an Email Send Agent" on page 47.

Select a send agent for delivering emails through an email task. A send agent represents a connection to an outbound mail server for the delivery of emails.

Navigate to **Orchestration** ⇨ **Delivery**, and then select a send agent from the drop-down menu. The send agent determines the values for the **From** and **Reply-to** fields on the **Header** tab. If you change the send agent, these values are reset to the default.

Specify How to Receive Unsubscribe Requests

To receive unsubscribe requests from recipients through an email reply, you can configure unsubscribe settings for a tenant. You can also configure unsubscribe settings for a single task. In an email task, you can override the unsubscribe settings that you configured for a tenant.

Note: The capability to receive unsubscribe requests through email reply is supported only for send agents that use SparkPost.

To configure unsubscribe settings in an email task, select **Orchestration** ⇨ **Delivery**.

Select an option to configure unsubscribe settings:

- If you do not want to receive unsubscribe requests through an email reply, select **Disable unsubscribe requests through email reply**.
- If you want to receive unsubscribe requests through an email reply, select **Enable unsubscribe requests through email reply**.

If you select **Enable unsubscribe requests through email reply**, specify one or more keywords that the subject text of the email reply must contain to process the unsubscribe requests. For example, you could specify the keywords “Unsubscribe” and “Opt out”. If an email reply from your recipient contains any of the keywords that you specified, the system processes the unsubscribe request. The preferences-related data is updated in the data hub records, and the email address is automatically excluded from future email tasks. If the subject text of an email reply contains multiple keywords that you specified, the system processes the unsubscribe request regardless of the order or the font case of the keywords.

Note: Use of special characters is not supported in the subject line of unsubscribe requests through email reply.

If you add or update a keyword after you have published a task, you must save and republish the task, and then update the custom unsubscribe text in your email. Unsubscribe requests are processed only for email replies that contain the updated keywords in the subject text.

For example, you specified the keyword “Unsubscribe” and you published the email task. An opt-out request is processed for all of the email replies that contain the keyword “Unsubscribe”. You modify the task and replace the keyword “Unsubscribe” with “Opt out”. You save and republish the task with the same email content. An unsubscribe request is processed for only those email replies that contain the word “Opt out”, not “Unsubscribe”.

CAUTION! Specify a single keyword in languages that do not use space separators between multiple words. For languages that do not use space separators between multiple words (for example, Chinese), you must specify options for single keywords. To unsubscribe through email reply, recipients must be directed to insert a single keyword in the subject text. Unsubscribe requests will not be honored for email replies with subject text that contains multiple keywords without space separators.

Note: The keywords that you specify in an email task take precedence over the keywords that you specify for a tenant. That is, task-level keywords are used to process unsubscribe requests. If no keywords are specified at the task level, then the keywords that you specified for the tenant are used to process unsubscribe requests.

All unsubscribe requests are processed through the send agent. If the selected send agent, which is used by a task, is associated with a program identifier, the unsubscribe requests are processed only for that program. If the selected send agent is not associated with a program identifier, unsubscribe requests are processed for all of the programs.

Adding Properties to Your Task

There are two types of properties that are associated with a task:

Properties that Identify the Task

Examples of properties that identify the task include **Description** and **Code**. To update task properties, click the **Properties** tab and modify the values in the fields as desired.

An item can be identified by its code for activities such as auditing and reporting. When an item is imported or migrated to SAS Customer Intelligence 360, the existing code value for the item is retained. Depending on the code settings for your environment, the code value might be editable. This value is not required to be unique to be valid. If the value is editable, you can change it to match the code value for another item. Valid characters for codes are alphanumeric characters, multi-byte characters, numerals, underscores, hyphens, and periods. Blank spaces are not allowed in code formats.

The **Code** field enables marketers to use a segment map to target customers based on their internal attributes (account type, balance, and so on) and their previous interactions. These codes are used to communicate information about the targeted customers to vendors or downstream systems. Using codes can minimize errors in text and punctuation that might occur when using an item name that is typically lengthy.

The information in the **Code** field can be used for operational reporting. The information can also be used to select or suppress customers for targeting messages (for example, a marketing message might target or exclude all customers who responded to direct marketing task *12345*).

Properties Used for Plans

To add planning information to a task, open the task and click . For more information, see “Creating a Planning Item” on page 259.

To return to the task view after opening the planning view, complete one of these actions:

- Fill out the required planning properties and save the task.
- Navigate to the **Tasks** view and click the task from the list.

Monitor Your Email Task

Email Task Insights

Use the **Insights** tab to monitor the success of your task after it has been published.

The **Summary** section contains information about email performance. The Attempted total is the number of messages that are passed from SAS to the mail transfer agent. The rate is the percentage of attempted emails that meet the primary metric. Move the sliders below the Rate of Success graph to view the conversion rate for a specific time period. Select **Show value markers** to add points at rate changes in the lines in the graph.

The **Performance** section displays the count of emails that are attempted, and the rate of success for the primary and secondary metrics.

The **Real-time Dashboard** section displays information about email task activity over the preceding 24 hours. For more information, see "Real-Time Email Task Performance Report" on page 793.

From the **Reports** section, the Email Campaign Performance report displays information about attempted messages for this task. Use this report to evaluate the performance of the task.

Select a **Month**, **Weekday**, or **Date** from the menus at the top of the report to filter the information by time period for each section. If you do not select a filter, the data is summarized for all time periods. The data is summarized each hour.

The report contains these sections that display different information:

Attempted

Click the **Attempted** tab to display the volume of attempted messages and hard bounces. The **Attempted** total is the number of messages that are passed from SAS to the mail transfer agent. The mail transfer agent analyzes the sender information for each email message before attempting delivery. The **Hard Bounce** total is the number of messages that the mail transfer agent indicates are undeliverable because the email addresses are invalid.

Select **Hour**, **Weekday**, **Month**, or **Date** at the bottom of the report to display the information for that unit of time. Position the cursor over the bar chart to display the time period and count for each bar.

User Actions

Click the **User Actions** tab to display the number of clicks, opens, and views. The **Clicks** total is the number of times a tracked link is clicked by an email recipient. A tracked link is a hyperlink in an email message. Unsubscribe and view on the web links are not included in the **Clicks** total. The **Opens** total is the number of messages that have been opened by recipients. The **Views** total is the number of times recipients view the web version of the email content in a browser.

Select **Hour**, **Weekday**, **Month**, or **Date** at the bottom of the report to display the information for that unit of time. Position the cursor over the bar chart to display the time period, count, and event for each bar.

Performance

Click the **Performance** tab to compare the number of attempted email messages, opens, views, and clicks.

Position the cursor over the bar chart to display the event and count for each bar.

Performance Rates

Click the **Performance Rates** tab to view the total click-to-open rate. This section illustrates the effectiveness of an email message and whether it has generated enough interest for recipients to click a link to learn more about the content.

Position the cursor over the chart to display the rate and date.

The published email tasks with the three highest conversion rates are listed on the SAS Customer Intelligence 360 **Home** page. A conversion occurs when a primary metric is met. The conversion rate is the number of unique visitor conversions divided by the number of unique visitor impressions or sent messages.

Monitor Email Events

You can learn which recipients opened, clicked, or viewed a link in the email and whether your emails were delivered. For more information, see “ About Email Events” on page 375.

Email events can be used to trigger a task or define a segment, or they can be combined with other events in a data view on page 459.

Example: Monitoring an Email Event

During a promotional event, your organization wants to send offers to a group of customers. As a marketer, your promotional campaign uses the email channel to promote offers. In your email content, you insert links to your website. A recipient clicks a link and views a spot on your website, which displays details about your promotional offer, and takes action regarding your offer. The links are uniquely constructed to monitor data for all individual recipient responses to the emails.

By default, data about recipients is gathered for all email events. You can discover how many recipients received the email, how many recipients opened the email, how many recipients clicked the links, and how many recipients viewed the website to explore the offer.

Monitor Open Events

Data Disparities in Records for Open Events

Data that is recorded for an open event might vary, depending on the email service provider that your recipient uses and the download settings for your images. You can track these disparities by using reports that show the "unique" metrics versus the "total" metrics. A single, unique open event is recorded only once for each visitor or email recipient.

Data Disparities Due to Image Settings

For some email providers, when a recipient opens the same email multiple times, the system does not record all of the open events. The system records an open event only if the email recipient enables the downloading of images.

When an email is opened for the first time, the database records an open event. Subsequently, open events are not recorded because the images that are inserted in an email message are stored in the cache on the email service provider's server. If the recipient re-opens the email, the images are displayed from the cache on the server. Therefore, the database records an open event only once.

Caching of images is implemented on a per-email basis. If a second email is sent to the same recipient, a new open event is recorded when the recipient opens the second email.

Note: Email client programs, which provide the ability to preview or prevent the downloading of images, might display a placeholder image (a small highlighted box) for the one-pixel tracking file that must be downloaded.

Data Disparities Due to Practices of Email Service Providers

In some cases, the initial open event might be recorded twice. This second record is created when an email service provider checks the content of the message before displaying it to the recipient.

Example: Data Disparities in Records for Open Events

A recipient receives an email sent through Google mail service. A Gmail open event is recorded only for the first time the recipient opens the email. Because Gmail uses a cache for resolving images in the email, the first time the request to resolve a one-pixel image is sent to the tracking tier, Gmail records an open event. For subsequent emails, Gmail uses its cache to resolve the images independently. If the recipient has disabled image downloading, then open events are not recorded.

Monitor Send Events

When an email task sends an email broadcast to multiple recipients, send events are recorded, regardless of the delivery status of the emails.

To facilitate legal compliance and operational monitoring, the system retains audit data about the emails that have been sent to recipients. Audit data includes the following information fields:

- Tenant ID: the value for the tenant identifier.
- Email task ID: the value for the campaign identifier.
- Send agent ID: the value for the send agent identifier.
- Initiated by: the user ID that initiated the campaign.
- Status: the values are `Sent`, `Failed`, and `System failure`.

  Note: A system failure status is reported if the send agent receives a send request but is unable to deliver the email.
- Reason: if the email is sent, the reason for failure has a `Null` value.
- TimeStamp: the time at which the audit entry is recorded.
- Send time: the time at which the send email request was received by the send agent.
- To field: the value for the customer identifier.
- From field: the value for the sender address.
- Reply-to: the value for the reply-to address.

Monitor Click Events

Links that you insert in an outbound message are tracked for the purpose of collecting behavioral data. The system automatically replaces all Hrefs of the links in the message with a unique URL that points to a domain that is hosted by SAS on the tracking server. The unique code in the tracked link is used to look up the original URL so that an HTTP request can be issued to redirect the link. The redirect request requires the original URL to be passed back in the location response header of the HTTP request. Some browsers do not correctly support headers that contain non-ASCII characters. If the redirection to the original link is for a URL that contains double-byte (non-ASCII) characters, then the browser might display an error. It is recommended that you not insert links to URLs that contain non-ASCII characters.

Monitor Complaint Events

When a complaint event such as spam is registered by a recipient, it is captured and recorded in the system if the spam information is available from the email service provider. A spam event is treated as an opt-out event. The email address that caused the event is automatically excluded from email tasks. This prevents further attempts to send emails to this address in the future.

Email service providers, such as Yahoo.com and Microsoft Outlook, provide feedback about spam or complaint events that are registered by the recipients.

Note: All of the data records might not be available for a complaint event such as spam. If a recipient marks the email as spam, some email service providers do not have a policy to notify the sender.

Monitor Hard Bounce Events

When an email is not delivered to a recipient due to an incorrect email address, a send event and a hard bounce event are recorded and the sender receives a notification. The time it takes to receive the notification depends on the email service provider, the number of attempts to deliver the promotional email, and the time it takes to process the delivery failure. It can take up to 840 minutes to receive a hard bounce notification.

When a hard bounce event occurs, the email address that caused the event is recorded. Hard bounce event records prevent further attempts by the tenant to send emails to the incorrect addresses.

Monitor Opt-Out Events

The recipient can unsubscribe from emails using these options:

- Click the **Unsubscribe** link provided in the body of the email, which is usually part of the email footer.
- Click the **Unsubscribe** link provided by various email clients such as Gmail, which is part of the email header.

When a recipient opts out of or unsubscribes to emails, the preferences-related data is updated in the records in the data hub. The attribute values, which help the marketer identify the method of unsubscribing, are also recorded.

When an opt-out event occurs, the email address that caused the event is recorded in the system. This email address is automatically excluded from email tasks. Excluding the email address prevents further attempts to send emails to the opted-out email address.

Monitoring Outbound Email Tasks with Task Monitor

View Email Tasks with Task Monitor

A task monitor shows active outbound tasks where you can track information for the tasks that are currently running and tasks that are executed in the past. The task monitor provides real-time metrics that indicate the progress of the task, problems with the execution of the task, and so on. By default, the latest execution of a task is shown. Task-level and occurrence-level data is displayed in tables. You can drill down to a specific execution occurrence for information by using 30 or more email delivery metrics. The task-level and occurrence-level data is explained in the tables on page 605. This data is updated every fifteen minutes.

To view the task monitor:

1. From the top navigation bar on the Tasks page, click . The **Job Information** page lists your submitted jobs.
2. Navigate to the **Bulk Tasks** tab. All the outbound tasks are listed.
3. Click the task to view the occurrence information of the outbound task.

   Note: Data from a Triggered task type is also displayed as a single occurrence. It is useful when you have published an externally triggered email task that is delivered to a large number of recipients.
4. Click to refresh the information.

To view more information about the task, you can add more columns:

1. Click .
2. Click **Manage columns**.
3. Select the columns that you want to display on the list screen and click **OK**.

Metrics for Email Task Monitoring

Some email tasks are executed once. Other email tasks such as a birthday promotion recur at specific intervals. The following tables describe the metrics that display the performance of the email task.

Table 46.3 Metrics for the Most Recent Email Task

Metric Name	Description
Last Execution Started	The time at which the SAS Customer Intelligence 360 server began the execution. Typically, it is the same as the Execution Created time, but it is noticeably later if there was a backlog on the server.
Total Recipients	The total number of recipients in the SAS Customer Intelligence 360 bulk email target segment, excluding those recipients who have already opted out or who have hard bounced.
Recipients Processed	The number of SAS Customer Intelligence 360 recipients who have been processed up to this point and the number of recipients who are Completed, Failed, and Skipped.
Recipients Completed	The number of recipients who successfully received an email. The value that is provided by the email send agent is equivalent to the attempted metric that is provided by SAS Customer Intelligence 360 in the email task reports.
Recipients Failed	The number of SAS Customer Intelligence 360 recipients who did not receive an email. For example, the email send failed because of a wrong email address. This assessment is completed in SAS Customer Intelligence 360 before the email is sent to the email send agent.
Recipients Skipped	The number of recipients who are skipped by SAS Customer Intelligence 360 because their impression limit was achieved.
Execution Occurrences	The number of times the SAS Customer Intelligence 360 task was executed.

Table 46.4 Metrics for All Occurrences of Email Tasks

Metric Name	Description
Execution Started	The time at which the SAS Customer Intelligence 360 server began the execution. Typically, it is the same as the Execution Created time, but it is noticeably later if there was a backlog on the server.

Metric Name	Description
Recipients Completed	The number of recipients who successfully received an email. The value that is provided by the email send agent is equivalent to the attempted metric that is provided by SAS Customer Intelligence 360 in the email task reports.
Recipients Failed	The number of SAS Customer Intelligence 360 recipients who did not receive an email. For example, the email send failed because of a wrong email address. This assessment is completed in SAS Customer Intelligence 360 before the email is sent to the email send agent.
Recipients Processed	The number of SAS Customer Intelligence 360 recipients who have been processed up to this point and the number of recipients who are Completed, Failed, and Skipped.
Recipients Skipped	The number of recipients who are skipped by SAS Customer Intelligence 360 because their impression limit was achieved.
Total Recipients	The total number of SAS Customer Intelligence 360 recipients in the bulk email target segment, excluding those recipients who have already opted out or who have hard bounced.
Accepted	Messages that an ISP or other remote domain has accepted from SAS Customer Intelligence 360, not including Out-of-Band bounces.

Table 46.5 Metrics Tracked and Reported by the Email Send Agent

Metric	Description
Admin Bounce	The total number of bounced messages that are classified as admin bounces, which includes the messages that are rejected.
Block Bounce	The total number of bounced messages that are caused by a blocked IP address.
Bounce	The total number of bounced messages, which includes both In-Band and Out-of-Band bounces.

Metric	Description
Clicked	The total number of times that links were selected across all of the delivered messages. This count includes unsubscribe links, opt-out, and view-on-web links. Note: If your account is configured only for short-link tracking, this value will be zero. In SAS Customer Intelligence 360 reports, the click events metric is calculated by the total number of times that a tracked link is clicked by a recipient. A tracked link is a hyperlink in an email message. Note: Unsubscribe links, such as opt-out, and view-on-web links, are tracked separately, and are not included in the count of click events.
Delayed	The total number of delays due to any temporary failure.
Delayed First	The total number of messages that were delayed on the first delivery attempt.
Delivered	The total number of messages that were delivered.
Delivered First	The total number of messages that were delivered on the first attempt.
Delivered Subsequent	The total number of messages that were delivered that required more than one delivery attempt.
Execution Created	The time at which the user initiated the execution.
Generation Failed	The total number of messages that failed to be generated for an intended recipient.
Generation Rejection	The total number of messages that were rejected by the email send agent due to policy.
Hard Bounce	The total number of messages that cannot be delivered by the recipient’s email service provider because the email address is invalid.
In-Band Bounce	The total number of messages that bounced on the delivery attempt during the SMTP session.
Injected	The total number of emails that were successfully generated or delivered by the email send agent.
Out-of-Band Bounce	The total number of messages that the ISP bounced after a successful delivery.
Policy Rejection	The total number of messages that were rejected by the email send agent due to policy.
Rejected	The total number of messages that were rejected by the email send agent due to policy, or the messages that failed to generate.

Metric	Description
Rendered	The total number of messages that were opened by recipients. If the email client protects the privacy of the recipient, no open events are tracked. Note: If your account is configured only for short-link tracking, this value will be zero. The value that is provided by the email send agent is equivalent to the open events metric that is provided by SAS Customer Intelligence 360 in the email task reports.
Sent	The total number of messages that the email send agent attempted to deliver, which includes messages that were delivered and messages that bounced.
Soft Bounce	The total number of bounced messages that were classified as soft bounce messages.
Spam Complaint	The total number of spam complaints that were received from an ISP.
Targeted	The total number of messages that were successfully injected into the email send agent from SAS 360 Engage: Email, including the messages that were rejected by the email send agent. The value that is provided by the email send agent is equivalent to the open events metric that is provided by SAS Customer Intelligence 360 in the email task reports.
Total Delivery Time First	The total time to deliver messages on the first attempt (in milliseconds).
Total Delivery Time Subsequent	The total time to deliver messages on subsequent attempts (in milliseconds).
Total Message Volume	The total size of delivered messages, in bytes (including attachments).
Undetermined Bounce	The total number of messages that bounced because of undetermined reasons.
Unique Clicked	The total number of messages that had at least one link selected one or more times. Unique click events are calculated based on the recipient's email address. SAS Customer Intelligence 360 considers the user identity as a unique identifier.
Unique Confirmed Opened	The total number of messages that were rendered or had at least one link selected. Unique click events are calculated based on the recipient's email address. SAS Customer Intelligence 360 considers the user identity as a unique identifier.

Metric	Description
Unique Rendered	The total number of messages that were initially rendered at least once. Unique click events are calculated based on the recipient’s email address. SAS Customer Intelligence 360 considers the user identity as a unique identifier.

PART 13

Delivering Mobile Content

47

Creating Mobile Content

About Mobile Content

SAS Customer Intelligence 360 collects digital data and then uses that data to gain insights about message, offer, and content performance across several channels. You can collect data across your mobile applications (apps) by using the analytics, marketing process orchestration, and reporting information provided based on customer or prospect behavior. Through creatives, messages, spots, events, and tasks, you can collect data and manage digital interactions across mobile channels.

You can identify the customers that you want to reach, create the locations where the content is to appear, and define the actions that make up the customer interactions with your content. Then, you can design the messages that contain your content and create the tasks and activities that deliver the content to your customers. To work effectively with your mobile content:

- create a mobile app to interact with your customers. You can use collected events to understand how your mobile app is performing and easily target users for content distribution. For more information, see “About the Mobile SDK”.
- define a creative. A creative represents the content that you want to be displayed to your customer. For more information, see “Creating Mobile In-App Message

Creatives", "Creating Mobile Push Notification Creatives", and "Creating HTML Creatives for Mobile Application Spots".

- create a message that is the container for your creative. A message contains the creatives that a task can deliver to your target audience. For more information, see "Creating Mobile Messages".
- identify the spots, or locations, where your content is displayed. A spot is the place on a mobile app where a task delivers content. When you create a spot, you can assign content to that spot. For more information, see "Creating Mobile Spots".
- identify the events that describe how customers interact with your content. An event enables you to define the customer behavior or action that you want to capture. Events can be used to trigger a task, set a metric, or define a segment. You can create mobile events for people who are interacting with a mobile app and create product view events that define an event when a visitor views a product page. For more information, see "Creating Mobile Events" and "Creating Mobile Product View Events".

  After you define one or more events, you can add the events to a data view, which provides a framework for how you want to use the event data. A data view can be used to trigger a task, set a metric, or define a target audience. For more information, see "About Data Views".
- create a task that delivers content to your customers in a mobile channel. You can engage with and deliver content to those customers through your mobile app. For more information, see "About Mobile Tasks".
- associate a task with an activity. For more information, see "About Activities".

Creating Mobile In-App Message Creatives

About Mobile In-App Message Creatives

An in-app message is displayed while a user is active within your mobile app. In-app messages are often used to deliver promotional offers and to show new users popular features in your mobile app.

You can create mobile in-app creatives to be used in an in-app message. A creative is the content that you want to be displayed to your customer.

You can create a creative from the **Creatives** component and from an open message or task. A creative can be included in one or more messages and tasks.

When you create a mobile in-app message creative, you select a large template or a small template. The large template is phone-sized and includes an image, a header, body text, and one or more buttons. Here is an example of a creative that uses the large template:

Figure 47.1 *In-App Message Using Large Template*

The small template is banner-sized and includes an image and body text. Here is an example of a creative that uses the small template:

Figure 47.2 *In-App Message Using Small Template*

The optimal image size for the large template is 320 x 227. The optimal image size for the small template is 85 x 76.

The supported file formats for images that are included in in-app message creatives are .jpeg, .jpg, and .png.

Create Creatives

To create a mobile in-app message creative:

1. From the **navigation bar**, click **Creatives**.
2. Click .
3. Select **Mobile In-App Message**.
4. Select a template. You can choose **Large** or **Small**.

   The template for the creative appears on the **New Creative** page. When you click an area in the template, a pane with the available options is displayed on the right-hand side. As you enter content and select options, the view changes. The view enables you to visualize what the in-app message might look like on a user's mobile device.

5 If you are using the large template, complete these steps:

   a Click the image block, and then click . In the **Image** pane, click . In the **Select Image** window, select one of these options:

      - Select **From Assets** and click to select a static image from the Assets repository in SAS Customer Intelligence 360.
      - Select **From URL** and enter a URL.

        Note: The URL must reference a publicly available image for the creative to render correctly.

      Click **Done**. You can add a border and select a border color.

   b Click the header block. In the **Header** pane, enter the header text that you want, and then select the font size, style, and color.

   c Click the message block. In the **Message** pane, enter the message that you want, and then select the font size, style, and color.

   d Click the button block. In the **Buttons** pane, select the number of buttons you want. For each button, enter a button label, and then select the font size, style, and color. Select the action and appearance of each button.

   e Click the background block. In the **Properties** pane, select the background color. You can add a border and select a border color.

6 If you are using the small template, complete these steps:

   a Click the image block, and then click . In the **Image** pane, click . In the **Select Image** window, select one of these options:

      - Select **From Assets** and click to select a static image from the Assets repository in SAS Customer Intelligence 360.
      - Select **From URL** and enter a URL.

        Note: The URL must reference a publicly available image for the creative to render correctly.

      Click **Done**. You can add a border and select a border color.

   b Click the message block. In the **Body** pane, enter the message that you want, and then select the font size, style, and color.

   c Click the background block. In the **Properties** pane, select the background color. You can add a border and select a border color.

7 Click **Done**.

8 (Optional) Navigate to the **Properties** tab to enter a description for the creative.

   The **Standard** section contains basic information about the creative, such as the name, type, description, category, and code.

   - The **Category** field is displayed only if the properties that are available in the system have been assigned a category.
   - The **Code** field is needed to map treatments from external applications to the creative.

When a treatment is imported or migrated to SAS Customer Intelligence 360 from an external application such as SAS Marketing Automation, the existing value for the object appears in the **Code** field. Depending on the code settings for your environment, the code value might be editable. This value is not required to be unique to be valid. If the value is editable, you can change it to match the code value for another item. Valid characters for codes are alphanumeric characters, multi-byte characters, numerals, underscores, hyphens, and periods. Blank spaces are not allowed in code formats.

The code is also used as the unique identifier for a creative that is delivered by a next best action web or mobile HTML task. For more information, see "Select the Task Type" on page 656.

If custom properties are configured, a **Custom** properties section is available in which you enter or view information for your custom properties. For more information, see "Define Custom Properties" on page 143.

9 Click . Enter a name for the creative, and then click **Save**.

10 If you are ready to publish the creative, navigate to the **Orchestration** tab and update the status:

- Select **Mark Ready** to change the status from Designing to Ready.

  Items with a Ready status can be changed back to a Designing status by clicking **Return to Designing**. Changing this status to Designing prevents the item from being published.

- Select **Mark Ready and Publish** to change the status from Designing to Active. Items with an Active status cannot be changed back to Designing.

Manage Creatives

Rename, Copy, Delete, and Edit a Creative

From the **Creatives** page, you can rename, copy, delete, and open (for editing) a creative. To access the options, select the creative in the list, and then select the appropriate action.

- To rename the creative, click and select **Rename**.

  You can rename a creative regardless of its status. The new name is reflected in all messages and tasks that include the creative. If you rename a creative that is published, it becomes out of sync and must be republished.

  TIP After you rename a creative that is included in an open message or task, when you return to the message or task, you might need to click to see the change.

- To copy the creative, click and select **Copy**.
- To open the creative for editing, click .

  Alternatively, click the name of the creative in the list.

- To delete the creative, click .

You can delete a creative that is published. You cannot delete a creative that is included in a task. When you delete a creative, the creative is removed from the creatives repository and from any messages that include the creative.

When you open a creative from inside a message, you can access the rename and edit options for the creative. On the **Messages** page, open the message that contains the creative you want to rename or edit. Select the creative, click ⋮, and then select the appropriate action. The changes that you make are applied to the original creative.

Change the Status

To change the status, open the creative and navigate to the **Orchestration** tab. Depending on the status of the creative, these are the options in the status list:

- **Mark Ready**: Changes the status from Designing to Ready. This option indicates that the creative is ready to be published.
- **Return to Designing**: Changes the status from Ready back to Designing.
- **Publish**: Changes the status from Ready to Active. When you publish an item, you are prompted to publish any dependent items that are marked Ready.
- **Republish**: Changes the status from Out of Sync back to Ready. If the content of a published item is changed and saved, that item becomes out of sync with the published version. To synchronize the content, select **Republish**. Otherwise, the item stays out of sync with the published version and the updates are not delivered.

  For more information, see "Republishing Out of Sync Items" on page 138.
- **End**: Changes the status from Active to Completed. This option prevents the creative from being published. A creative with a Completed status cannot be included in a task. Only a creative that is not currently in use by a task can be completed. Ending an item stops any associated data collection and makes the item's content unavailable. In addition, any unsaved changes to the creative are lost.

View Usage Information

From the **Orchestration** ⇨ **Usage** tab, you can view which items use the creative and the items that the creative uses.

The ability to view dependencies between items enables you to see the items that a task depends on to work successfully. Usage information helps you identify how changes that you make to one item might affect another item.

Items That Use the Creative

The first section shows the items that use the creative. For example, if the creative is used in a task, the task is included in the list.

The Priority column displays the priority of like tasks that use the creative. Priority applies only to mobile spot, web spot, and mobile in-app message tasks because each of those task types might have two or more tasks that compete for the same resources. Other task types do not use prioritization.

For non-A/B test tasks, priority is on a scale of 1 through 5 (where 1 is the highest). The default is 3. An A/B test task has a priority of Test, which is higher than a non-A/B test task. An A/B test task always delivers its content.

You can change the priority of a non-A/B test task on the task's **Orchestration** ⇨ **Priority** tab.

Items That the Creative Uses

The second section shows items that the creative uses.

- Click **Directly Related** to list the items that the creative uses. For example, if a creative uses an asset, the asset is included in the list.
- Click **All Related** to view directly related items as well as any items that those directly related items use. For a creative, the list of directly related and all related items is the same.

  The list displays items with a Designing, Ready, or Active status. Click **Show Designing Status only** to display only items with a Designing status.

To open an item, click the item. To view item details and to open the item, click ⓘ in the item's row.

Note: HTML assets that are the content source for mobile spot, web spot, and email creatives are not listed.

Creating Mobile Push Notification Creatives

About Mobile Push Notification Creatives

A push notification is a message that is sent from a mobile app to a mobile device. A user does not have to be using the mobile app or using their device in order to receive a push notification. Push notifications are typically used to encourage users who are not currently using their mobile app to take a desired action.

You can create mobile push notification creatives to be used in a push notification. A creative is the content that you want to be displayed to your customer.

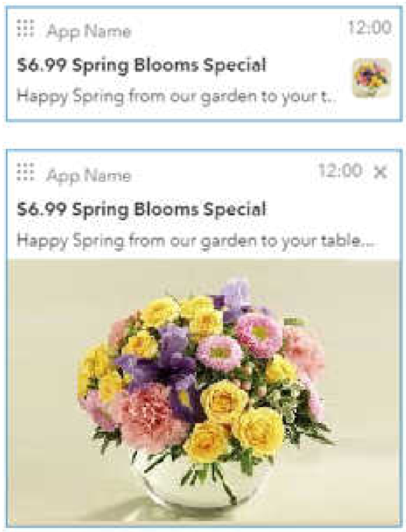
Consider these best practices when you create a push notification creative:

- Provide a title that is an attention-grabbing summary of the default message.
- Write a message that encourages the user to open your mobile app. For example, you might invite the user to open your mobile app to see a new personalized offer or to take a tour of new experiences in your mobile app.
- Include an appealing or informative image to provide a more engaging experience for the mobile app user.
- Personalize the message (for example, by including the user's name).

You can create a creative from the **Creatives** component, and you can create a creative from an open message or task. A creative can be included in one or more messages and tasks.

The appearance of a push notification varies depending on the user's mobile device and how the user interacts with push notifications. When you create a push notification, two views are displayed: initial (unopened) and expanded (opened). These views enable you to visualize what the push notification might look like on a user's mobile device. Here is an example of the two views of a mobile push notification creative:

Figure 47.3 *Push Notification Views*



The supported file formats for images that are included in push notification creatives are .jpeg, .jpg, and .png.

Create Creatives

To create a mobile push notification creative:

1 From the navigation bar, click **Creatives**.

2 Click .

3 Select **Mobile Push Notification**.

   Two views are displayed: initial (unopened) and expanded (opened). These views enable a user to visualize how the message might appear, based on how the user interacts with the push notification creative on a mobile device.

4 (Optional) Add a title.

   Note: The maximum recommended number of characters for a title is 128. If the notification includes an image, the maximum recommended number of characters is 55.

5 Click to personalize the push notification title for each customer. For more information, see "Use Merge Tags to Personalize Push Notifications".

   CAUTION! Select only event attributes for triggered mobile push notifications. In triggered mobile push notifications, only event attributes are valid for use in merge tags. Values from other data sources such as uploaded demographic data are not resolved.

6 Enter the message that you want.

Note: The maximum recommended number of characters for notification text is 256. If the notification includes an image, the maximum recommended number of characters is 55.

7 Click to personalize the push notification text for each customer. For more information, see “Use Merge Tags to Personalize Push Notifications”.

CAUTION! Select only event attributes for triggered mobile push notifications. In triggered mobile push notifications, only event attributes are valid for use in merge tags. Values from other data sources such as uploaded demographic data are not resolved.

8 (Optional) Click to add an image. In the **Select Image** window, select one of these options:

- Select **From Assets** and click to select a static image from the Assets repository in SAS Customer Intelligence 360.
- Select **From URL** and enter a URL.

  Note: The URL must reference a publicly available image for the creative to render correctly.

9 From the **Notification action** drop-down list, select the instruction that you want to pass to the application so that the application knows what to do when the user taps a notification. For example, for a calendar application, the action might be to instruct the application to open when a user taps a reminder.

If you select **Link in application**, enter a notification URI. A notification URI is an instruction in the form of a string. In some cases, the URI might be in the form of a link, but in other cases, the URI represents an action to be taken. According to the instruction given by the URI, the application developer codes the application to respond appropriately when the user interacts with the push notification. Valid URIs are provided by the application developer.

10 Click **Done**.

11 (Optional) Navigate to the **Properties** tab to enter a description for the creative.

The **Standard** section contains basic information about the creative, such as the name, type, description, category, and code.

- The **Category** field is displayed only if the properties that are available in the system have been assigned a category.
- The **Code** field is needed to map treatments from external applications to the creative.

  When a treatment is imported or migrated to SAS Customer Intelligence 360 from an external application such as SAS Marketing Automation, the existing value for the object appears in the **Code** field. Depending on the code settings for your environment, the code value might be editable. This value is not required to be unique to be valid. If the value is editable, you can change it to match the code value for another item. Valid characters for codes are alphanumeric characters, multi-byte characters, numerals, underscores, hyphens, and periods. Blank spaces are not allowed in code formats.

  The code is also used as the unique identifier for a creative that is delivered by a next best action web or mobile HTML task. For more information, see “Select the Task Type” on page 656.

If custom properties are configured, a **Custom** properties section is available in which you enter or view information for your custom properties. For more information, see "Define Custom Properties" on page 143.

12 Click . Enter a name for the creative, and then click **Save**.

13 If you are ready to publish the creative, navigate to the **Orchestration** tab and update the status:

- Select **Mark Ready** to change the status from Designing to Ready.

  Items with a Ready status can be changed back to a Designing status by clicking **Return to Designing**. Changing this status to Designing prevents the item from being published.

- Select **Mark Ready and Publish** to change the status from Designing to Active. Items with an Active status cannot be changed back to Designing.

Use Merge Tags to Personalize Push Notifications

You can use merge tags in scheduled or bulk push notifications to personalize the text of the creative for each recipient. These push notifications are published outside of activities. You can select a merge tag or enter merge tag syntax manually.

Add Merge Tags to a Creative

To select an existing merge tag:

1 Click to personalize the creative for each customer.

2 In the **Select Merge Tag** window, select a merge tag.

- Click to display a hierarchical view of merge tags. You can expand and collapse individual folders. Click to expand all of the folders. Click to collapse all of the folders.
- Click to display individual merge tags in alphabetical order.

3 In the **Default value** field, enter the value to use if the merge tag cannot retrieve data. Click **OK**.

The merge tag that you inserted retrieves data from the customer table in the data hub. Each customer views personalized content.

Note: If a customer record is removed or updated with an identity import, and that record is referred to in a merge tag, the merge tag value is not updated to reflect the record. To make sure that the merge tag is referring to an accurate record, take one of these actions:

- Delete the identity data on page 251.
- Import data for the customer, using the data hub ID, customer ID, or another known ID. In the CSV file, make all the entries blank in order to overwrite the values in the system. For more information, see Chapter 20, "Importing Data," on page 185.

Enter Merge Tag Syntax Manually

You can manually enter the merge tag syntax:

```
%%<source>.<category>.<name>%%
```

In the merge tag syntax, `source` represents the data source, `category` is the data group, and `name` is the field name of the data item.

If you manually enter a merge tag, you can insert **| |** after `name` and specify a default value within the syntax:

```
%%<source>.<category>.<name>||<default value>%%
```

By default, automatic number formatting is applied to numbers. A string, such as a postal code, is displayed as `25,678` instead of `25678`. To override automatic number formatting, insert `$` after `%%` :

```
%%$<source>.<category>.<name>%%
```

In this example, automatic number formatting is overridden for a postal code:

```
%%$DATAHUB.customer.zip%%
```

Enter Conditional Merge Tags

A conditional merge tag enables you to build a condition, which combines text and merge tags. Based on the condition that you specify, for each person, the merge tags are replaced with text data values. The text data values are retrieved from the data hub. You can manually add merge tag syntax to build a condition using common operators. Conditional merge tags use @@ symbols to delimit the tag. The operators =, <, >, <>, >=, and <= are used to build conditions.

To add a conditional merge tag:

1. In the **Text** block, position your cursor where you want to insert a merge tag.
2. Add the appropriate merge tag syntax.
   - You can add a merge tag with a simple condition. For example, content that is delivered to men (where `gender=M`) must contain the greeting “Dear sir”.

     ```
     @@datahub.customer.gender=M##Dear Sir.@@
     ```

     The text after the ## symbol is the value that is inserted if the condition is true. In the conditional merge tag syntax, `datahub` represents the data source, `customer` represents the data group, and `gender` is the field name of the data item.
   - Conditional merge tags do not contain a default value. However, you can insert text values for conditions that are false by using the || symbol.

     For example, content that is delivered to men (where `gender=M`) must contain the greeting “Dear sir”. Content that is delivered to women (where `gender=F`) must contain the greeting “Dear madam”.

     ```
     @@datahub.customer.gender=M##Dear sir.||Dear madam. @@
     ```

     The text after the ## symbol is the value that is inserted if the condition is true. The text after the || symbol is the value that is inserted if the condition is false.

- If the value of the data item `gender` is missing, or if the value of the data item is other than `M` or `F`, you can use the `{{ }}` symbols to create a complex chain that combines multiple merge tag conditions.

  For example, the content that is viewed by men (where `gender=M`) must contain the greeting “Dear sir”, and the content that is viewed by women (where `gender=F`) must contain the greeting “Dear madam”. If both conditions are false, the greeting “Dear customer” must be inserted.

  ```
  Dear {{@@datahub.customer.gender=M##sir,
  @@ @@datahub.customer.gender=F##madam, @@||customer }}
  ```

  The text after the ## symbol is the value that is inserted if the condition is true. The text after the || symbol is the value that is inserted if the condition is false.

  In the syntax, `customer` is used as a default value if neither merge tag condition within the `{{ }}` inserts text values. Merge tag conditions inside a chain can provide values for both true and false outcomes. The chain of merge tag conditions is evaluated from left to right and from top to bottom. If one of the merge tag conditions inserts text, evaluation of the remaining chain is ended.

- You can build a merge tag condition for missing data values.

  For example, the `age` value for some people is missing in the database. For these people, the text “We do not know how old you are, but we bet you are young at heart!” must be inserted.

  ```
  @@datahub.customer.age=.
  ##We do not know how old you are, but we bet you are young at heart!@@
  ```

- You can combine regular merge tags with merge tag conditions inside a chain.

  For example, if the `age` value for some people is missing in the database, the text “We do not know how old you are, but we bet you are young at heart!” must be inserted. If the `age` value for the people is available in the database, this additional text is inserted by the regular merge tag:

  ```
  {{@@datahub.customer.age=.
  ##We do not know how old you are, but we bet you are young at heart!@@
  ||Isn't it great being %%datahub.customer.age%% years of age!}}
  ```

Example: Offer a Discount to New Customers

In this example, customers sign up for a program that offers childcare supplies. A personalized welcome message invites each new customer to open an application and receive a discount.

First, build a creative that contains the merge tags.

1 From the **navigation bar,** click **Creatives**.

2 Click .

3 Select **Mobile Push Notification**.

4 In the **Notification text** field, enter this text:

```
Dear ,
Welcome to the Club for Excellent Parents!
```

```
Here is a discount toward your first purchase.
```

5 Place the cursor after `Dear` and click .

6 In the **Select Merge Tag** window, select a merge tag named **New Customer**. In this example, the site has a customer table that contains customers who have signed up in the past 24 hours. A **New Customer** merge tag retrieves content from the table. For more information, see Chapter 20, “Importing Data,” on page 185.

7 In the **Default value** field, type `Valued Customer`. Click **OK**.

8 In the **Notification action** drop-down list, select **Open application**.

9 Click **Done**.

10 Click . Enter a name for the creative, and then click **Save**.

Add the creative to a message container.

Note: You can create multiple creatives for different purposes and add the creatives to a single message container.

1 From the **navigation bar**, click **Messages**.

2 Click .

3 Select **Add Existing Creative**.

4 Select the creative that you created and click **Done**.

5 In order to be pushed, a creative must be active. In the creative, click and select **Mark Ready and Publish**.

Add the message to a task that performs the push notification.

1 From the navigation bar, click **Tasks**.

2 Click .

3 Select **Push Notification**.

4 Select **Bulk** to deliver messages at the same time.

5 Select an application name and click **Create Task**.

6 Click **Select content**, select the message container that you created, and then click **OK**.

7 On the **Content** tab, click . In the **Total Impressions** list, select **1** to indicate that a customer sees the offer only one time.

8 On the **Targeting** tab, choose a segment, imported list, or transient list that targets customers who have signed up during the past 24 hours.

9 On the **Orchestration** tab, click **Set a schedule**, and then click **Recurrence**.

10 Click and select **No end date**. Click **OK**.

11 Select **Mark Ready and Publish**. You are prompted to save the task.

12 Enter a name for the task, and then click **Save**.

When the task is published, a discount offer is made every day to customers who have signed up during the past 24 hours.

Manage Creatives

Rename, Copy, Delete, and Edit a Creative

From the **Creatives** page, you can rename, copy, delete, and open (for editing) a creative. To access the options, select the creative in the list, and then select the appropriate action.

- To rename the creative, click ⋮ and select **Rename**.

  You can rename a creative regardless of its status. The new name is reflected in all messages and tasks that include the creative. If you rename a creative that is published, it becomes out of sync and must be republished.

  > **TIP** After you rename a creative that is included in an open message or task, when you return to the message or task, you might need to click to see the change.

- To copy the creative, click ⋮ and select **Copy**.
- To open the creative for editing, click .

  Alternatively, click the name of the creative in the list.

- To delete the creative, click .

  You can delete a creative that is published. You cannot delete a creative that is included in a task. When you delete a creative, the creative is removed from the creatives repository and from any messages that include the creative.

When you open a creative from inside a message, you can access the rename and edit options for the creative. On the **Messages** page, open the message that contains the creative you want to rename or edit. Select the creative, click ⋮ , and then select the appropriate action. The changes that you make are applied to the original creative.

Change the Status

To change the status, open the creative and navigate to the **Orchestration** tab. Depending on the status of the creative, these are the options in the status list:

- **Mark Ready**: Changes the status from Designing to Ready. This option indicates that the creative is ready to be published.
- **Return to Designing**: Changes the status from Ready back to Designing.
- **Publish**: Changes the status from Ready to Active. When you publish an item, you are prompted to publish any dependent items that are marked Ready.
- **Republish**: Changes the status from Out of Sync back to Ready. If the content of a published item is changed and saved, that item becomes out of sync with the published version. To synchronize the content, select **Republish**. Otherwise, the item stays out of sync with the published version and the updates are not delivered.

For more information, see "Republishing Out of Sync Items" on page 138.

- **End**: Changes the status from Active to Completed. This option prevents the creative from being published. A creative with a Completed status cannot be included in a task. Only a creative that is not currently in use by a task can be completed. Ending an item stops any associated data collection and makes the item's content unavailable. In addition, any unsaved changes to the creative are lost.

View Usage Information

From the **Orchestration** ⇨ **Usage** tab, you can view which items use the creative and the items that the creative uses.

The ability to view dependencies between items enables you to see the items that a task depends on to work successfully. Usage information helps you identify how changes that you make to one item might affect another item.

Items That Use the Creative

The first section shows the items that use the creative. For example, if the creative is used in a task, the task is included in the list.

The Priority column displays the priority of like tasks that use the creative. Priority applies only to mobile spot, web spot, and mobile in-app message tasks because each of those task types might have two or more tasks that compete for the same resources. Other task types do not use prioritization.

For non-A/B test tasks, priority is on a scale of 1 through 5 (where 1 is the highest). The default is 3. An A/B test task has a priority of Test, which is higher than a non-A/B test task. An A/B test task always delivers its content.

You can change the priority of a non-A/B test task on the task's **Orchestration** ⇨ **Priority** tab.

Items That the Creative Uses

The second section shows items that the creative uses.

- Click **Directly Related** to list the items that the creative uses. For example, if a creative uses an asset, the asset is included in the list.
- Click **All Related** to view directly related items as well as any items that those directly related items use. For a creative, the list of directly related and all related items is the same.

  The list displays items with a Designing, Ready, or Active status. Click **Show Designing Status only** to display only items with a Designing status.

To open an item, click the item. To view item details and to open the item, click ⓘ in the item's row.

Note: HTML assets that are the content source for mobile spot, web spot, and email creatives are not listed.

Creating HTML Creatives for Mobile Application Spots

About HTML Creatives

You can create HTML creatives for mobile application spots. You can edit the HTML source of an HTML creative, embed content from a URL, or add an asset to the creative. You can also add a merge tag to personalize the creative with customer information such as a name, or behavioral information such as a cart total.

Note: A creative's HTML character count cannot exceed 2,048 characters.

Create Creatives

To create an HTML creative for a mobile application spot:

1. From the **navigation bar**, click **Creatives**.
2. Click .
3. Select **HTML**.
4. In the HTML editor, use any of these options to edit the content:
   - Edit the HTML source.
   - Click to embed content from a URL or add an asset.
   - Click to add an image or an HTML asset from the assets repository.
   - Click to personalize the HTML creative for each customer by inserting merge tags or variables.
     - The available merge tags are retrieved from imported customer data and that data is displayed consistently across tasks. For example, a creative with a merge tag that displays a customer's name always displays a customer name when used in a task, regardless of which task the creative is used in.
     - You can choose to insert a variable instead of a merge tag. Variables provide more flexibility by allowing the merge tag to be selected later, after the creative is added to a task. In addition, personalization variables can display imported customer information or behavioral information. The behavioral information, such as a cart total or the name of a product that a person has added to their cart, is retrieved from an event or data view. Because personalization variables enable you to select the merge tag while designing the task, you can reuse the same creative to display different types of personalized information. For example, in a web task, a

creative with a variable can display a cart total. In a mobile task, the same creative can display a customer name.

To learn about merge tags and their prerequisites, see “Adding Personalized Information to Creatives” on page 447.

For information about using merge tags and variables in creatives, including syntax details, see “Personalizing HTML Creatives” on page 630.

Note: Creating an HTML creative automatically opens the HTML editor. However, you might need to update the properties of the creative before you can complete your work in the editor. In that case, click **Done** to save your changes and close the editor. When you are ready to return to the editor, navigate to **Content** ⇨ **Layout** and click **Edit**.

5 Click **Done**.

6 (Optional) Navigate to the **Properties** tab to enter a description for the creative.

The **Standard** section contains basic information about the creative, such as the name, type, description, category, and code.

- The **Category** field is displayed only if the properties available in the system have been assigned a category.
- The **Code** field is needed to map treatments from external applications to the creative.

  When a treatment is imported or migrated to SAS Customer Intelligence 360 from an external application such as SAS Marketing Automation, the existing value for the object appears in the **Code** field. Depending on the code settings for your environment, the code value might be editable. This value is not required to be unique to be valid. If the value is editable, you can change it to match the code value for another item. Valid characters for codes are alphanumeric characters, multi-byte characters, numerals, underscores, hyphens, and periods. Blank spaces are not allowed in code formats.

  The code is also used as the unique identifier for a creative that is delivered by a next best action web or mobile HTML task. For more information, see “Select the Task Type” on page 656.

If custom properties are configured, a **Custom** properties section is available in which you enter or view information for your custom properties. For more information, see “Define Custom Properties” on page 143.

7 Click , enter a name for the creative, and then click **Save**.

8 If you are ready to publish the creative, navigate to the **Orchestration** tab and update the status:

- Select **Mark Ready** to change the status from Designing to Ready.

  Items with a Ready status can be changed back to a Designing status by clicking **Return to Designing**. Changing this status to Designing prevents the item from being published.

- Select **Mark Ready and Publish** to change the status from Designing to Active. Items with an Active status cannot be changed back to Designing.

Personalizing HTML Creatives

You can add personalized customer information to creatives by adding merge tags. With merge tags, your creative can display information about a customer, such as a name, or behavioral information available from an event or data view. When you add a merge tag, you have the option of selecting a variable to insert in place of the merge tag. Inserting a variable enables the merge tag to be selected in the task, instead of in the creative.

For more information about merge tags and variables, see “Adding Personalized Information to Creatives” on page 447.

Insert a Merge Tag or Variable

A creative can include both a merge tag and a variable. To insert a merge tag or a variable, you need to be in the HTML editor.

Note: The merge tag or variable is inserted at the place where your cursor is located.

1 Click ⃟.

2 Add a merge tag:

   a Select the tag from the list.

   Note: If the merge tag is not in the list, you might need to exit the HTML editor and update the information on the **Properties** tab. For example, you might need to set the category of the merge tag, or select the custom merge tag from a list. After you update the **Properties** tab, save the creative and re-open the editor. To return to the editor, navigate to **Content** ⇨ **Layout** and click **Edit**.

   b (Optional) Enter a default value for the merge tag. The default value is used when the customer data cannot be retrieved. For example, if a user is not logged on to your website, SAS Customer Intelligence 360 cannot know their identity. As a result, no customer information is available to replace the merge tag. Instead, the default value is used.

   Note: You can manually enter the merge tag into the HTML code if you do not want to select it from the list.

3 Add a variable:

   a Click **Insert Variable** from the **Select in task** section. The HTML code is updated with a default variable.

   Note: When someone adds a creative containing a variable to a task, that person needs to select a merge tag to use for the task.

   b (Optional) The variable must start and end with braces. However, you can change the variable name by editing the content within the braces. For example, you can replace

   `{{variable1}}`

   with

```
{{cart amount}}
```

or

```
{{user name}}
```

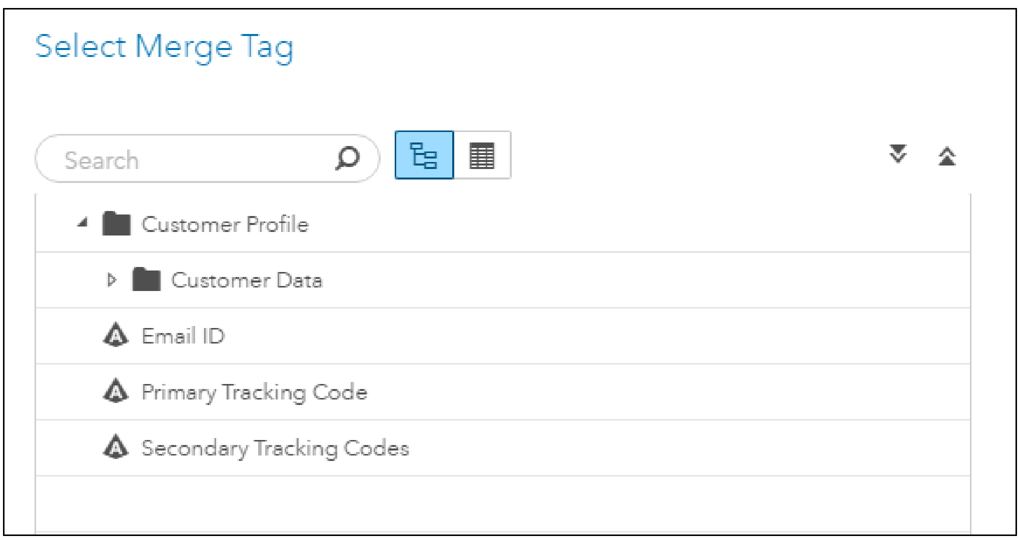
.

After inserting either a merge tag or a variable, the creative must then be added to a task. The task can then deliver the personalized content.

Select a Merge Tag

In the **Select Merge Tag** window, click to display a hierarchical folder view of merge tags. You can expand and collapse individual folders. Click to expand all of the folders. Click to collapse all of the folders.

Figure 47.4 *Select Merge Tag Window*



Click to display individual merge tags in alphabetical order.

Enter Merge Tag Syntax Manually

You can manually enter the merge tag syntax:

```
%%<source>.<category>.<name>%%
```

In the merge tag syntax, `source` represents the data source, `category` is the data group, and `name` is the field name of the data item.

If you manually enter a merge tag, you can insert | | after `name` and specify a default value within the syntax:

```
%%<source>.<category>.<name>||<default value>%%
```

By default, automatic number formatting is applied to numbers. A string, such as a postal code, is displayed as `25,678` instead of `25678`. To override automatic number formatting, insert `$` after `%%` :

```
%%$<source>.<category>.<name>%%
```

In this example, automatic number formatting is overridden for a postal code:

```
%%$DATAHUB.customer.zip%%
```

Example: Use Variables and Merge Tags to Target Event Attributes

You can use any event and the event attributes to personalize tasks. For example, you can use a Web task to display a personalized message to customers who add a particular product to their cart.

1 Select **Creatives** on the navigation bar and click .

2 Click **HTML**.

3 In the HTML source, position the cursor where you want to add the variable. Click and select **Insert Variable**. The variable name is inserted in braces.

   The HTML text could be similar to this example:

   ```
   Hi,{{variable1}}! We hope you'll love our Super Sandals!
   ```

   You can also add the product image to the creative.

4 Select **Tasks** on the navigation bar and click

5 Click **Web**.

6 On the **Content** tab, click **Select Content** and select the HTML creative that you added.

7 The variable must be associated with a merge tag. On the **Targeting** tab, select an Add to Cart event. Add an attribute condition that the product name of Super Sandals must be met.

8 On the **Content** tab, click and select “customer first name” from the Customer Data folder.

When the event, creative, and task are published, customers who add the specified product to their cart will view a personalized creative.

Example: Use Variables and Merge Tags to Target Data View Attributes

You can use merge tags and data views to target attributes such as the product names from multiple events. For example, you can use a Web task to display the specific product name, quantity, and SKU when one of a number of products is added to a cart.

1 Select **Events** on the navigation bar and click .

2 Click **Add to Cart**.

3 Click **Click**.

4 Select the click target.

5 On the **Event Details** tab, select **Product Attributes** and supply values for Product Name, Product SKU, and Product Quantity Added to Cart.

6 Create another Add to Cart event for a different product and specify the product attributes.

7 Select **Data Views** on the navigation bar and click .

8 On the **Conditions** tab, add the two Add to Cart events that you have created. The common attributes for both events are listed on the **Attributes** tab of the data view.

9 Select **Creatives** on the navigation bar and click .

10 Click **HTML**.

11 In the HTML source, position the cursor where you want to add the variables. For each variable, click and select **Insert Variable**. The variable name is inserted in braces. You can replace the name in braces with your own text.

The HTML text could be similar to this example:

```
Product: {{product name}
<p>
SKU: {{SKU}}
<p>
Quantity: {{product quantity}}
```

12 Select **Tasks** on the navigation bar and click

13 Click **Web**.

14 On the **Content** tab, click **Select Content** and select the HTML creative that you added.

15 The variables must be associated with merge tags. On the **Targeting** tab, select the data view that you created.

16 On the **Content** tab, click . Click for each variable and specify the Product Name, SKU, and Product Quantity attributes.

When the event, data view, creative, and task are published, the correct product information is displayed when a specific product is added to a cart.

Manage Creatives

Rename, Copy, Delete, and Edit a Creative

From the **Creatives** page, you can rename, copy, delete, and open (for editing) a creative. To access the options, select the creative in the list, and then select the appropriate action.

- To rename the creative, click and select **Rename**.

  You can rename a creative regardless of its status. The new name is reflected in all messages and tasks that include the creative. If you rename a creative that is published, the creative becomes out of sync and must be republished.

TIP After you rename a creative that is included in an open message or task, when you return to the message or task, you might need to click to see the change.

- To copy the creative, click and select **Copy**.
- To open the creative for editing, click .

  Alternatively, click the name of the creative in the list.
- To delete the creative, click .

  You can delete a creative that is published. You cannot delete a creative that is included in a task. When you delete a creative, the creative is removed from the creatives repository and from any messages that include the creative.

When you open a creative from inside a message, you can access the rename and edit options for the creative. On the **Messages** page, open the message that contains the creative you want to rename or edit. Select the creative, click , and then select the appropriate action. The changes that you make are applied to the original creative.

Change the Status

To change the status, open the creative and navigate to the **Orchestration** tab. Depending on the status of the creative, these are the options in the status list:

- **Mark Ready**: Changes the status from Designing to Ready. This option indicates that the creative is ready to be published.
- **Return to Designing**: Changes the status from Ready back to Designing.
- **Publish**: Changes the status from Ready to Active. When you publish an item, you are prompted to publish any dependent items that are marked Ready.
- **Republish**: Changes the status from Out of Sync back to Ready. If the content of a published item is changed and saved, that item becomes out of sync with the published version. To synchronize the content, select **Republish**. Otherwise, the item stays out of sync with the published version and the updates are not delivered.

  For more information, see "Republishing Out of Sync Items" on page 138.
- **End**: Changes the status from Active to Completed. This option prevents the creative from being published. A creative with a Completed status cannot be included in a task. Only a creative that is not currently in use by a task can be completed. Ending an item stops any associated data collection and makes the item's content unavailable. In addition, any unsaved changes to the creative are lost.

View Usage Information

From the **Orchestration** ⇨ **Usage** tab, you can view which items use the creative and the items that the creative uses.

The ability to view dependencies between items enables you to see the items that a task depends on to work successfully. Usage information helps you identify how changes that you make to one item might affect another item.

Items That Use the Creative

The first section shows the items that use the creative. For example, if the creative is used in a task, the task is included in the list.

The Priority column displays the priority of like tasks that use the creative. Priority applies only to mobile spot, web spot, and mobile in-app message tasks because each of those task types might have two or more tasks that compete for the same resources. Other task types do not use prioritization.

For non-A/B test tasks, priority is on a scale of 1 through 5 (where 1 is the highest). The default is 3. An A/B test task has a priority of Test, which is higher than a non-A/B test task. An A/B test task always delivers its content.

You can change the priority of a non-A/B test task on the task's **Orchestration** ⇨ **Priority** tab.

Items That the Creative Uses

The second section shows items that the creative uses.

- Click **Directly Related** to list the items that the creative uses. For example, if a creative uses an asset, the asset is included in the list.
- Click **All Related** to view directly related items as well as any items that those directly related items use. For a creative, the list of directly related and all related items is the same.

  The list displays items with a Designing, Ready, or Active status. Click **Show Designing Status only** to display only items with a Designing status.

To open an item, click the item. To view item details and to open the item, click ⓘ in the item's row.

Note: HTML assets that are the content source for mobile spot, web spot, and email creatives are not listed.

Creating Mobile Messages

Messages give you a way to organize creatives by grouping them together, regardless of the channel or device for which the creatives are designed. Messages typically contain more than one creative. Creatives of different types can be in the same message. For example, a message can include an HTML creative and a mobile in-app creative.

Only HTML assets can be the source of a creative. Mobile in-app messages and push notification messages use images, not HTML. Therefore, the option to import an asset as a creative is not applicable to mobile in-app or push notification message creatives. The option is applicable to HTML creatives that deliver content to mobile spots.

A message and its creatives can be added to a task only once the message is marked ready or is published. For more information, see the following documentation:

- Chapter 35, "Creating Messages," on page 437

- Chapter 36, “Managing Creatives and Messages,” on page 445

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Creating Mobile Spots and Events

Creating Mobile Spots

A spot is the place on a mobile app where a task delivers content. When you create a spot, you can assign content to that spot. Adding default content to a spot ensures that the spot is never empty, even if there are no tasks delivering content to that spot.

Create Spots

To create a mobile spot:

1 From the **navigation bar**, click **Spots**.

2 Select .

3 Select **Mobile**.

4 Specify the application where the spot occurs. Click **Create Spot**.

5 On the **Spot Details** ⇨ **Spot Configuration** tab, update the properties that are associated with your spot.

- Click if you want to change the application where the spot occurs.
- Enter a unique ID in the **Spot ID** field. For best results, create a spot ID that is similar to the corresponding spot name. For example, if your spot name is *Weekly Ad*, you might use the spot ID *Weekly_Ad*.

6 Navigate to the **Spot Details** ⇨ **Spot Attributes** tab to add spot attributes.

Custom attributes can be used to indicate a more refined context for the spot. For example, you might create a custom attribute named *Department* with a value of *Apparel* for a spot that is designated for an apparel message.

Spot attribute names can contain only ASCII letters, digits, underscores, or dots, and the names must begin with a letter. In addition, spot attribute names cannot have more than 32 characters.

To add an attribute, click +. Enter an attribute name and select a data type.

7 (Optional) Navigate to the **Default Content** tab to activate the switch to add default content to your spot.

Specifying default content ensures that content is displayed in your spot even if the spot is not used in an active task.

Note: Only HTML creatives are used for mobile spots.

a Click + or **Select Content** and select the message or creative that you want to set as the default content.

b Click **OK**.

8 Click . Enter a name for the spot, and then click **Save**.

9 If you are ready to publish the spot, navigate to the **Orchestration** tab and update the status.

- Select **Mark Ready** to change the status from Designing to Ready.

  Items with a Ready status can be changed back to a Designing status by clicking **Return to Designing**. Changing this status to Designing prevents the item from being published.

- Select **Mark Ready and Publish** to change the status from Designing to Active. Items with an Active status cannot be changed back to Designing.

Manage Spots

Rename, Copy, Delete, and Edit a Spot

From the **Spots** page, you can rename, copy, delete, and open (for editing) a spot. To access the options, select the spot in the list, and then select the appropriate action.

- To rename the spot, click ⋮ and select **Rename**.

  You can rename a spot regardless of its status. The new name is reflected in all tasks that include the spot. If you rename a spot that is published, it becomes out of sync and must be republished.

  TIP After you rename a spot that is included in an open task, when you return to the task, you might need to click to see the change.

- To copy the spot, click ⋮ and select **Copy**.

  The copy contains the same spot details and default content as the original, except for the unique spot ID that you enter.

- To open the spot for editing, click .

  Alternatively, click the spot name in the list.

- To delete the spot, click 🗑.

  You can delete a spot that is published. You cannot delete a spot that is included in a task. When you delete a spot, the spot is removed from the spots repository.

Change the Status

To change the status, open the spot and navigate to the **Orchestration** tab. Depending on the status of the spot, these are the options in the status list:

- **Mark Ready**: Changes the status from Designing to Ready. This option indicates that the spot is ready to be published.
- **Return to Designing**: Changes the status from Ready back to Designing.
- **Publish**: Changes the status from Ready to Active. When you publish an item, you are prompted to publish any dependent items that are marked Ready.
- **Republish**: Changes the status from Out of Sync back to Ready. If the content of a published item is changed and saved, that item becomes out of sync with the published version. To synchronize the content, select **Republish**. Otherwise, the item stays out of sync with the published version and the updates are not delivered.

  For more information, see "Republishing Out of Sync Items" on page 138.
- **End**: Changes the status from Active to Completed. Completed spots cannot be included in a task and cannot be modified. Ending a spot stops any associated data collection and makes the spot's content unavailable. In addition, any unsaved changes to the spot are lost.

  Note: If you complete a spot that is associated with an active task, then that active task is also completed. If you complete a spot that is associated with an active task that is part of an activity, then both the task and the activity are completed. As a result, all data collection ends for these items. Content cannot be delivered to completed spots. Therefore, any unpublished tasks that use the completed spot need to be updated to use a different spot before the tasks can be published.

View Usage Information

From the **Orchestration** ⇨ **Usage** tab, you can view which items use the spot and the items that the spot uses.

The ability to view dependencies between items enables you to see the items that a task depends on to work successfully. Usage information helps you identify how changes that you make to one item might affect another item.

Items That Use the Spot

The first section shows the items that use the spot. For example, if the spot is used in a task, the task is included in the list.

The Priority column displays the priority of like tasks that use the spot. Priority applies only to mobile spot, web spot, and mobile in-app message tasks because each of those task types might have two or more tasks that compete for the same resources. Other task types do not use prioritization.

For non-A/B test tasks, priority is on a scale of 1 through 5 (where 1 is the highest). The default is 3. An A/B test task has a priority of Test, which is higher than a non-A/B test task. An A/B test task always delivers its content.

You can change the priority of a non-A/B test task on the task's **Orchestration** ⇨ **Priority** tab.

Items That the Spot Uses

The second section shows items that the spot uses.

- Click **Directly Related** to list the items that the spot uses. For example, if a spot uses a creative, the creative is included in the list.
- Click **All Related** to view directly related items as well as any items that those directly related items use. For example, you might see the creative that the spot uses and an asset that is used by that creative.

  The list displays items with a Designing, Ready, or Active status. Click **Show Designing Status only** to display only items with a Designing status.

To open an item, click the item. To view item details and to open the item, click ⓘ in the item's row.

Note: HTML assets that are the content source for mobile spot, web spot, and email creatives are not listed.

Monitor the Performance of a Spot

View the Performance of a Single Spot

From the **Insights** tab, you can view information that can help you determine how effective a spot is. For example, you can find information about how much traffic your spot is getting. Then you can use the information to help you determine whether the spot is in a good location for the creative that your task is displaying.

Note: The spot must have an Active status.

The **Summary** section contains details about the volume of people that have seen the spot. Select one of these metrics from the **Variable** drop-down list:

- **Unique Users**: This metric counts only the first viewable impression, showing you how many individuals have seen the spot.
- **Viewable Impressions**: This metric counts every impression by a user, showing you the total number of impressions that have been displayed. As a result, the number of unique users is always less than or equal to the number of viewable impressions.

You can also choose the time period for which to display metrics. You can select the previous 7 days, 14 days, or 30 days.

As you change the options in the spot performance graph, other metrics on the page change to reflect what you selected. You can hover the pointer over a data point in the graph to see information about that data point. Right-clicking a data point gives you the option to create a task that contains the spot.

For example, if you want to see how many people have seen your spot in the last week, open the spot and click the **Insights** tab. For the graph that is displayed in the

Summary section, set **Data for Most Recent** to **7 days** and set **Variable** to **Unique Users**.

Compare the Performance of Multiple Spots

You can compare the effectiveness of two or more spots in one view.

1. Select two or more spots with an Active status.
2. Click ⋮ and select **Compare Spot Metrics.**

The performance metrics for all of the selected spots are displayed in the same spot performance graphs.

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Working with Mobile Tasks

About Mobile Tasks

A mobile task delivers targeted content to mobile users and collects information that you can use to monitor how the task is performing. You can then engage with and deliver content to those customers through your mobile application.

These are the types of mobile tasks that you can create:

- Mobile in-app message task. Use this task to deliver a notification that is displayed while a user is active in a mobile application.
- Mobile push notification task. Use this task to deliver a notification that is displayed while a user is not active in a mobile application.
- Mobile spot task. Use this task to display a message on a specific spot within a mobile application.
- Mobile A/B test task. Use this task to compare the effectiveness of multiple creatives against your target audience.

  For more information about A/B testing, see "About A/B Testing" on page 931.

You can access the items that a task uses and information about the task by navigating through the different tabs.

- The **Content** tab contains items, such as creatives, that relate to the content that your task delivers.
- The **Targeting** tab contains the details about your target audience, including a count of members and a summary of all criteria that make up the target audience. You can specify who to include or exclude from your target audience by adding criteria and existing segments.
- The **Orchestration** tab contains the schedule and priority of the task. The tab also contains details about any item associated with the task. There is a list of items that the task uses, such as creatives, segments, or spots. There is also a list of items that use the task. For example, if an activity includes this task, that activity is displayed in the list. From this tab, you can see what items your task depends on to work successfully.
- The **Insights** tab includes information about how the task is performing.

When you create a task, it has a Designing status, which indicates that the task is still being worked on and is not ready to be published. When you finish working on your task, you can either mark it ready to be published, or you can publish it. Before you can successfully publish a task, any items included in that task must have a Ready status or an Active status. A task cannot be published if it contains items that have a Designing status or a Completed status. The items that your task depends on might include events, spots, segments, or creatives.

Tasks can be published on their own or included as part of an activity. An activity enables you to create and orchestrate your interactions with customers in real time by using tasks and conditions. When the task that you are creating is part of a larger plan for customer interaction, include that task in an activity. Tasks that are created from the **Tasks** interface can be added to an activity map after they have been created. However, a task cannot be added to an activity map after the task has been published. You can also create a task from within an activity map. You can create a task from an activity, or you can include an existing task in an activity. Active and Completed tasks cannot be included in an activity. For more information, see "About Activities".

Creating Mobile Spot Tasks

Mobile spots enable you to display a message on a specific spot within a mobile application.

Add Content to Your Task

All of the details and items associated with the content that your task delivers are specified on the **Content** tab. Use the icons to change the spot, message, and creatives that the task uses. You can also set the distribution and impression limits for the creatives or add targeting criteria to each creative associated with the task.

Add a Mobile Spot Task

1 From the navigation bar, click **Tasks**.

2 Click and select **Mobile Spot** to deliver content to a mobile application.

3 Select the location where you want your content to be displayed. Click **Create Task**.

Add a Spot

You can add a spot to the task. While you are designing your task, you can see information about the spot by clicking to open the **Spot** page. On the spot page, click to change the spot where your content is displayed. You can select an existing spot, or you can click **New Spot** to create one. The spot that you create is automatically added to the task.

Add Message or Creatives

1 Click .

2 Click **Select Content** to add a message or creatives to the task. If there is more than one creative, in the **Select creatives** section, select which creatives the task displays.

Note: Instead of selecting an existing message or creative to add to the task, you can choose to create a message or creative. To create a message or creative, click **New Message** or **New Creative**. The message or creative that you create is automatically added to the task.

For information about using merge tags in HTML creatives, see "Personalizing HTML Creatives" on page 630.

Set Distribution of Content

If this task contains more than one creative, you can refine how each creative is displayed. Click the icon to open the **Distribution** tab and select the method that you want the task to use when determining how to display content.

Frequency Distribution

Select **Frequency** to specify how often a creative is displayed compared with the other creatives in this task. Next, set a percentage for each creative.

Note: Frequency is the default distribution method. By default, each creative is assigned equal distribution.

Sequential Distribution

Select **Sequential** to set the order in which the creatives are displayed.

CAUTION! The order is reset every 24 hours. After 24 hours the order is reset, and the first creative in the sequence is selected again. If the content delivery schedule for your task is longer than 24 hours, the creatives might not be displayed in the order that you have specified.

Rule-based Distribution

Select **Rule-based** to split a task's target audience into subgroups and associate a creative with each subgroup, thereby personalizing the content that your target audience sees. You can assign different criteria to each creative so that you can decide which creatives are delivered to different subgroups of the target audience.

Note: When you select the rule-based option, the criteria that you add to each creative are applied after the criteria on the **Targeting** tab are applied. Think of rule-based criteria as a way of refining which members of the task's target audience see specific creatives.

Each creative is assigned a number that indicates the order in which the creative's targeting criteria are evaluated. The creative that has the number 1 associated with it is evaluated first. The first creative with criteria that match a user is the creative that is delivered to that user. As a result, any creatives that come after the matching creative are not evaluated.

You can change the numbers that are associated with a creative by changing the position of the creative in the list. To change the creative order:

1 Click the icon from the **Distribution** tab.

2 Select the creative that you want to move.

3 Click the arrows to move the creative up or down in the list.

A best practice is to ensure that there is always a creative that is displayed in your spot. For web and mobile spot tasks, there are two ways to ensure that a spot that this task delivers content to is never empty.

- Your task includes a spot that contains a default creative.
- The creative in the rule-based creatives list that comes last (that is, the creative associated with the highest number) does not contain additional targeting. A creative that is listed last and does not have additional criteria associated with it is displayed when none of the previous criteria match the task's audience member.

The creative that does not contain additional criteria becomes the default creative for this task. The default creative is denoted by . As a result, any creatives listed after the default creative are never delivered.

Note: When you create a mobile in-app message or mobile push notification, you must denote one creative as the default creative.

To add targeting criteria to each creative, select the creative and follow these steps:

- Select **All of the following** to include members who meet all of the criteria in a group. Or, select **Any of the following** to include members who meet one or more of the criteria in a group.
- Click to view a summary of the criteria.
- Click to make a copy of the criteria.
- Click or to move criteria up or down in the list.
- Click to create a group for a set of criteria.
- Click to add criteria. In the **Select Criteria** window, select the criteria to add. In addition, you can use customer lists that have been imported from other sources, such as SAS Marketing Automation.

  Note: For mobile in-app, mobile spot, and web targeting, when you add **Browser and Device** to your criteria, only the people who are using that browser or device during the current session are included in the target audience. For example, if you add Chrome as the browser, only the people who are using Chrome during the current session are eligible to be included in the target audience.

  When you add a spot attribute that contains a URL query string parameter, the value of that parameter needs to be decoded for multi-byte character sets (MBCS). If you are adding a URL query string, the value should be encoded for MBCS.

Set Impression Limits

Click to limit the number of times a customer sees your content.

- Select **Limit total impressions per user** to specify the total number of times a creative is displayed to a customer. This limit is valid for the duration of this task.
- Select **Limit impressions per user by period**.

  Select **Time period** to specify the maximum number of impressions that a user sees during a specified time interval (for example, minutes, hours, days, or months).

Select **Session** to limit the number of impressions that a user sees while interacting with content, such as your website or mobile app. By default, the session is set to expire after 30 minutes of inactivity, but you can contact a SAS representative to modify this value.

Add a Target Audience

On the **Targeting** tab, set the criteria that define the target audience for the content that the task delivers.

On the **Eligible** page, you can specify which people to include in your target audience. On the **Exclusions** page, you can specify which people to exclude from your target audience.

Note the following rules about defining the target audience:

- If no criteria are added, the target audience includes everyone.
- When you create a target audience using demographic criteria such as city, age, gender, membership status, and so on, only the users who satisfy criteria based on their current data are included in the target audience.
- Previously defined segments, events, and data views can be selected as criteria.

  Note: You must define a login event type if you have tasks that depend on segments with data from logged-in users.

  TIP The attributes of the events or data views added to the targeting criteria can be selected as values for personalization variables by navigating to **Content** ⇨ **Personalization**. For more information about delivering personalized content, see “Personalizing HTML Creatives” on page 630.

- You can use customer lists that have been imported from other sources, such as SAS Marketing Automation.
- When you add **Browser and Device** to your criteria, only the people who are using that browser or device during the current session are included in the target audience. For example, if you add Chrome as the browser, only the people who are using Chrome during the current session are eligible to be included in the target audience.
- When you add a spot attribute that contains a URL query string parameter, the value of that parameter needs to be decoded for multi-byte character sets (MBCS). If you are adding a URL query string, the value should be encoded for MBCS.

To add criteria:

1. Click **Eligible** or **Exclusions**.
2. Click + to add a criteria row.
3. In the **Specify criteria** box, click .
4. In the **Select Criteria** window, select the criteria to add.

   To locate criteria, use these options:

- Click to display a hierarchical folder view of criteria. Click to display individual merge tags in alphabetical order.
- Click to expand all of the folders. Click to collapse all of the folders.
- Click to view details, if available, about the criteria.
- Search for criteria by entering the name in the **Search** field. Select criteria and click to display details.

5 Click **OK**.

6 If applicable, in the **Specify values** box, click and specify a value for the criteria.

For example, if channel is your selected criterion, you might specify a value of mobile or web. Whereas, there is no need to specify a value if a segment is selected.

7 Repeat steps 1-6 to add criteria.

8 Use these options to work with the criteria list:

- Click to view a summary of the criteria.
- Click to make a copy of the criteria. Copying criteria saves steps when you use the same criteria but supply different values.
- Click or to move criteria up or down in the list. The position determines the order in which the criteria are checked.
- Click to create a group for a set of criteria. Groups enable you to nest criteria.
- Click to delete criteria.

9 Select **All of the following** to include members who meet all of the criteria in a group. Or, select **Any of the following** to include members who meet one or more of the criteria in a group.

10 Click .

Mobile Device and Cell Service Attributes

To define your target audience, you can select these mobile device attributes in addition to other criteria:

- Mobile App Version. This value is extracted from native APIs, or it can be specified by `setApplicationVersion` in the mobile SDK. For more information, see “Determine the Mobile App Version” on page 412.
- Mobile Application Name
- Mobile Device Manufacturer
- Mobile Device Model
- Mobile Device Type. The attribute values are *Phone* or *Tablet*.
- Mobile Platform. The attribute values are *iOS* or *Android*.

- Mobile Platform Version
- Mobile Screen Height
- Mobile Screen Width

Cell service attributes are available only on devices that have mobile data access. You can select these cell service attributes:

- Mobile Carrier Name
- Mobile Country Code
- Mobile Network Code

Set Metrics

Metrics measure events that the system can detect. For example, the system can detect certain events such as a person clicking a spot on a web page. Add metrics to measure the success of the content being delivered by the task.

Set a Primary Metric

The primary metric measures conversions to determine the success of the task. There can be only one primary metric. You can either edit an existing primary metric or add a new one and then remove the previous metric.

1. Click **+**.

2. Select the criteria that you want to add. You can select an event view or a data view.

   For more information about events, see “User-Defined Events” on page 304. For more information about data views, see “About Data Views” on page 459.

3. If attributes are defined for the event or data view, select the attribute conditions that must be met. For example, for a Click Through metric, you can select a particular creative as an attribute condition. The primary metric would be a click-through response to that creative.

   Note: Attributes are joined by an AND operator. Make sure that you do not define conflicting attributes that result in a condition that cannot be met.

4. To mark this selection as a contact or response that can be tracked and used for reporting and future targeting, select **Classify this selection**. Classifying an event or data view enables you to compare contacts and responses across creatives and channels. You can personalize future messages and creatives. You can also use the information to segment customers. You can classify events and data views in both primary and secondary metrics.

   To record the number of times that a customer interacts with a creative or a spot, select **Mark this selection as a contact**. This information is available as contact history for SAS Marketing Automation, SAS Real-Time Decision Manager, and other applications.

   To mark this selection as a response to a creative, select **Mark this selection as a response**.

5 Select **Stop delivery after conversion** to stop delivering creatives when the primary metric for the task is met.

When delivery of the creatives stops, that same spot might switch to displaying creatives from another task. If there is no other task delivering a creative to that spot, then the spot's default creative is displayed. If there are no other tasks delivering content to that spot and there is no default content defined for that spot, then the spot is empty.

Set Secondary Metrics

A secondary metric measures other benchmarks that you are interested in. A task can have multiple secondary metrics. Each secondary metric can have only one data view or event.

Click **Add Secondary Metric** to add a secondary metric.

Modify Existing Metrics

You can change the settings for an existing metric.

Note: The action icons for a metric are only visible when the metric has focus. For example, a metric has focus when you tab to it or when you move your mouse over the metric.

- Click to update the metric details.
- Click to remove a metric.

Set the Priority of Your Task

Multiple tasks might compete for the same resource. For example, you might create two mobile spot tasks that use the same spot.

When this happens, the system needs to know which task to deliver to the user. For this reason, tasks must be assigned a priority.

Here are the rules for how relative priority is determined:

- Priority is set relative to other tasks of the same type.
- Priority is set based on a scale of 1 to 5, where 1 is the highest priority and 5 is the lowest priority. The default priority is 3. You can change the priority.

  Note: A/B test tasks have a priority of Test, which is a higher priority than tasks that are not A/B tests. You cannot change the priority of an A/B test task.
- If the priority of two or more tasks of the same type is the same and a user qualifies for both, the system randomly chooses the task to deliver.

To set the priority of a task:

1 Navigate to the **Orchestration** ⇨ **Priority** tab.

2 Select the number that represents the task’s priority over all other tasks that compete for the same resource.

Note: If an A/B test task exists that competes for the same resource, the A/B test task delivers its content regardless of the priority that you set here.

View Usage Information

From the **Orchestration** ⇨ **Usage** tab, you can view which items use the task and the items that the task uses.

The ability to view dependencies between items enables you to see the items that a task depends on to work successfully. Usage information helps you identify how changes that you make to one item might affect another item.

Items That Use the Task

The first section shows the items that use the task. For example, if the task is used in an activity, the activity is included in the list.

The Channel, Priority, and Type columns do not apply to activities and are therefore empty.

Items That the Task Uses

The second section shows items that the task uses.

- Click **Directly Related** to list the items that the task uses. For example, if a task uses a creative, the creative is included in the list.
- Click **All Related** to view directly related items as well as any items that those directly related items use. For example, you might see the creative that the task uses and the asset that is used by the creative.

  The list displays items with a Designing, Ready, or Active status. Click **Show Designing Status only** to display only items with a Designing status.

To open an item, click the item. To view item details and to open the item, click ⓘ in the item's row.

Note: HTML assets that are the content source for mobile spot, web spot, and email creatives are not listed.

Schedule and Start Your Task

When you finish updating your task, you can mark the task ready, publish the task immediately, or set a schedule for the task.

Note: When you schedule a bulk email task, a bulk mobile push notification task, or a direct marketing task, allow a minimum of five minutes between the time you publish the task and the scheduled start time for the task to be active. This time delay is needed by the system to process the request.

On the **Orchestration** tab, take these actions:

- Click **No schedule** if you plan to publish the task manually.
- Click **Set a schedule** to set a time period that the task is active.
  - Select a time zone. For example, you might want to select a time zone that is different from the default if the task is targeted to a specific locale. By default,

the time zone is the same as the time zone that is set for the tenant. If a valid time zone is not set for the tenant, the default time zone is UCT.

- Click **Single occurrence** to specify a single time span that the task is active.
- Select a start date and an end date for the task.

  Note: If you select **Single occurrence**, the start date cannot be edited after the task is published.

- Click **Recurrence** to specify a recurring task. Click .

  Specify these details for a recurring schedule:

  - **Start time** is the start time for the first occurrence.
  - **Duration** specifies the amount of time that the content is available for each occurrence. For example, a task might start every week on Monday, and continue for four days.
  - **Frequency** specifies that the schedule for the recurrence. If you click **Weekly**, click the day for each occurrence. You can select multiple days in each week. If you click **Monthly**, select the numbered day or the weekday for the recurrence. For example, you can select the 10th day of each month or the second Tuesday of each month.

    Note: You can edit the weekly or monthly frequency after the task is published and the start date has passed. The recurrence must occur within the start and end dates.

  - **Range of recurrence** specifies the start and end dates, or that the recurrence continues without an end date.

- **Extend metrics analysis** continues collecting data after the last occurrence. Select the number of days to extend data collection. The default value is 7 days. For example, if you use the default value, and the **Start time** is 9:00 PM, data collection continues until 9:00 PM seven days after the **End by** date.

  Customers might respond several days after the last occurrence. You can extend the time for data collection in order to more effectively measure task performance.

  During the extended period of data collection, the status is Active - Metrics Only. The status changes to Complete when the **Extend metrics analysis** period is over.

- Select **Mark Ready** to change the status from Designing to Ready. A Ready status indicates that this item is ready to be published. When you are ready to promote an item from a Ready status to an Active status, click **Publish**.

  Note: When you publish an item, you are prompted to publish any dependent items that are marked Ready.

  Items with a Ready status can be changed back to a Designing status by clicking **Return to Designing**. Changing this status to Designing prevents the item from being published.

  Note: If your item has a Ready status and a start date, the item is not automatically published when the start date is reached. For example, if you are creating a task, it must be published in order for the start date to activate the task.

- Select **Mark Ready and Publish** to change the status from Designing to Active. Items with an Active status cannot be changed back to Designing.

Changes to a scheduled or active task are not automatically propagated to the published version of the task. You must republish the task after you save it to resolve the Out of Sync status. Otherwise, the task stays out of sync with the published version and the updates are not delivered.

When the end date of a task is reached, its status changes to Complete. Completed tasks cannot be modified. The task stops any associated data collection and makes the task's content unavailable. In addition, any unsaved changes are lost.

Note: A recurring schedule is not available if the task is included in an activity.

Pause the Task

You can pause an active task to temporarily stop delivery of a task. For example, if you want to correct the percentage of a discount that is offered, you can pause the task, edit the amount, and republish. You do not need to end a task in order to update the content. You can make the same changes to a paused task that you can make to an active task.

When a task is paused, you can resume the task to restart content delivery or end the task.

To pause an active task, select **Pause** on the **Orchestration** tab.

During the time that a task is paused, content is no longer delivered. Customers are not selected by the task. Data such as conversions continues to be collected based on impressions that were viewed prior to the pause. When the task resumes, new data is added to the data that was collected before the pause.

Content delivery that does not rely on a trigger and is in progress, such as bulk mobile push notifications, might continue for items that are already in the queue.

If the task is paused and the content has not changed, select **Resume** to make the task active again.

If task content is changed and saved, the task becomes out of sync. Select **Republish** to make the task active again and to deliver the updated content.

End the Task

While your task is running, it collects data and gathers information about progress toward your goals. Navigate to the **Insights** tab to check the progress of your task.

Click **End** on the **Orchestration** tab when you no longer need the task to run or when the scheduled end date is reached. The status changes from Active to Complete. Completed tasks do not collect new data, do not deliver content to a spot, and cannot be modified. Any unsaved changes to the task are lost.

Add Properties to Your Task

There are two types of properties that are associated with a task:

Properties that Identify the Task

Examples of properties that identify the task include **Description** and **Code**. To update task properties, click the **Properties** tab and modify the values in the fields as desired.

An item can be identified by its code for activities such as auditing and reporting. When an item is imported or migrated to SAS Customer Intelligence 360, the existing code value for the item is retained. Depending on the code settings for your environment, the code value might be editable. This value is not required to be unique to be valid. If the value is editable, you can change it to match the code value for another item. Valid characters for codes are alphanumeric characters, multi-byte characters, numerals, underscores, hyphens, and periods. Blank spaces are not allowed in code formats.

The **Code** field enables marketers to use a segment map to target customers based on their internal attributes (account type, balance, and so on) and their previous interactions. These codes are used to communicate information about the targeted customers to vendors or downstream systems. Using codes can minimize errors in text and punctuation that might occur when using an item name that is typically lengthy.

The information in the **Code** field can be used for operational reporting. The information can also be used to select or suppress customers for targeting messages (for example, a marketing message might target or exclude all customers who responded to direct marketing task *12345*).

Properties Used for Plans

To add planning information to a task, open the task and click . For more information, see “Creating a Planning Item” on page 259.

To return to the task view after opening the planning view, complete one of these actions:

- Fill out the required planning properties and save the task.
- Navigate to the **Tasks** view and click the task from the list.

Creating a Staged Creative Mobile Spot Task

You can configure a mobile spot task to deliver the staged creative offers received from an external application, such as SAS Real-Time Decision Manager, that has been configured to send the offers to SAS Customer Intelligence 360.

Prerequisites

To enable a task to deliver staged creative offers:

1 Configure an access point to map an external application to SAS Customer Intelligence 360. For more information, see “Add a General Access Point” on page 54.

2 Using instructions from `/stage/README_install.txt` in the SDK ZIP file that you downloaded for the access point, configure the server for your external application. For more information, see “Contents of the General Access Point SDK” on page 61.

3 In SAS Customer Intelligence 360, create an event. For more information, see “User-Defined Events” on page 304. From the **Orchestration** ⇨ **External Availability** tab, select the access point. The event name is used in the mapping file for the access point.

   Note: The manner in which the next best offer is presented is determined by the type of event that you create. For example, if you create a page view event, the event is triggered by viewing a web page.

4 Create an offer in your external application.

   For more information, see the documentation for your external application.

5 In SAS Customer Intelligence 360, import the offer from the external application as a creative. For more information, see “Importing Creatives” on page 436.

6 Open the imported creative, click **Edit** on the **Content** tab, and then add an image and image text. For more information, see “Add Content to Your Task” on page 709.

7 On the **Orchestration** tab, select **Mark Ready and Publish**.

Select the Task Type

1 From the **Task** view, click .

2 Click **Mobile Spot**.

3 Select the spot where you want the content to be delivered. Click **Refine Task Type**.

   Note: Clicking **Create Task** before setting the staged creative option in **Refine Task Type** creates a standard task. After clicking **Create Task**, you cannot return to this screen to select the option to create a staged creative task.

4 To create a next best action task, select **Create a stand-alone task that delivers content when it is staged by an external system**. After you create the next best action task, the task is triggered when an external system calls the staging API with a code that matches the code that you entered for the task. The next best action task then delivers a creative if the external system calls the staging API with a matching code and if the system meets any other targeting criteria in the task. For example, a web task delivers a creative to a spot if the staging API received the matching code and the spot associated with the task is being viewed by the customer.

5 Click **Create Task**.

For information about configuring mobile spot tasks, see “Creating Mobile Spot Tasks” on page 645.

Creating Mobile In-App Message Tasks

In-app messages are notifications that are displayed while the user is active in the application itself.

Add Content to Your Task

Add a Mobile In-App Message Task

1 From the navigation bar, click **Tasks**.

2 Click and select **In-App Message** to deliver content to a mobile application.

3 Select the application where your message will be delivered. Click **Create Task**.

Add Message or Creatives

All of the details and items associated with the content that your task delivers are specified on the **Content** tab. In the properties pane of the **Content** tab, use the icons to change the spot, message, and creatives that the task uses. You can also set the distribution and impression limits for the creatives or add targeting criteria to each creative associated with the task.

1 On the **Content** tab, click .

2 Click **Select Content** to add a message or creatives to the task. If there is more than one creative, in the **Select creatives** section, select which creatives the task displays.

   Note: Instead of selecting an existing message or creative to add to the task, you can choose to create a message or creative. To create a message or creative, click **New Message** or **New Creative**. The message or creative that you create is automatically added to the task.

Set Distribution of Content

If this task contains more than one creative, you can refine how each creative is displayed. Click to open the **Distribution** tab and select the method that you want the task to use when determining how to display content.

Frequency Distribution

Select **Frequency** to specify how often a creative is displayed compared with the other creatives in this task. Next, set a percentage for each creative.

Note: Frequency is the default distribution method. By default, each creative is assigned equal distribution.

Sequential Distribution

Select **Sequential** to set the order in which the creatives are displayed.

CAUTION! The order is reset every 24 hours. After 24 hours the order is reset, and the first creative in the sequence is selected again. If the content delivery schedule for your task is longer than 24 hours, the creatives might not be displayed in the order that you have specified.

Rule-based Distribution

Select **Rule-based** to split a task's target audience into subgroups and associate a creative with each subgroup, thereby personalizing the content that your target audience sees. You can assign different criteria to each creative so that you can decide which creatives are delivered to different subgroups of the target audience.

Note: When you select the rule-based option, the criteria that you add to each creative are applied after the criteria on the **Targeting** tab are applied. Think of rule-based criteria as a way of refining which members of the task's target audience see specific creatives.

Each creative is assigned a number that indicates the order in which the creative's targeting criteria are evaluated. The creative that has the number 1 associated with it is evaluated first. The first creative with criteria that match a user is the creative that is delivered to that user. As a result, any creatives that come after the matching creative are not evaluated.

You can change the numbers that are associated with a creative by changing the position of the creative in the list. To change the creative order:

1 Click from the **Distribution** tab.

2 Select the creative that you want to move.

3 Click the arrows to move the creative up or down in the list.

A best practice is to ensure that there is always a creative that is displayed in your spot. For web and mobile spot tasks, there are two ways to ensure that a spot that this task delivers content to is never empty.

- Your task includes a spot that contains a default creative.
- The creative in the rule-based creatives list that comes last (that is, the creative associated with the highest number) does not contain additional targeting. A creative that is listed last and does not have additional criteria associated with it is displayed when none of the previous criteria match the task's audience member.

The creative that does not contain additional criteria becomes the default creative for this task. The default creative is denoted by . As a result, any creatives listed after the default creative are never delivered.

Note: When you create a mobile in-app message or mobile push notification, you must denote one creative as the default creative.

To add targeting criteria to each creative, select the creative and follow these steps:

- Select **All of the following** to include members who meet all of the criteria in a group. Or, select **Any of the following** to include members who meet one or more of the criteria in a group.
- Click to view a summary of the criteria.
- Click to make a copy of the criteria.
- Click or to move criteria up or down in the list.
- Click to create a group for a set of criteria.
- Click + to add criteria. In the **Select Criteria** window, select the criteria to add. In addition, you can use customer lists that have been imported from other sources, such as SAS Marketing Automation.

  Note: For mobile in-app, mobile spot, and web targeting, when you add **Browser and Device** to your criteria, only the people who are using that browser or device during the current session are included in the target audience. For example, if you add Chrome as the browser, only the people who are using Chrome during the current session are eligible to be included in the target audience.

  When you add a spot attribute that contains a URL query string parameter, the value of that parameter needs to be decoded for multi-byte character sets (MBCS). If you are adding a URL query string, the value should be encoded for MBCS.

Set Impression Limits

Click to limit the number of times a customer sees your content.

- Select **Limit total impressions per user** to specify the total number of times a creative is displayed to a customer. This limit is valid for the duration of this task.
- Select **Limit impressions per user by period**.

  Select **Time period** to specify the maximum number of impressions that a user sees during a specified time interval (for example, minutes, hours, days, or months).

  Select **Session** to limit the number of impressions that a user sees while interacting with content, such as your website or mobile app. By default, the session is set to expire after 30 minutes of inactivity, but you can contact a SAS representative to modify this value.

Add a Target Audience

On the **Targeting** tab, set the criteria that define the target audience for the content that the task delivers.

On the **Eligible** page, you can specify which people to include in your target audience. On the **Exclusions** page, you can specify which people to exclude from your target audience.

Note the following rules about defining the target audience:

- If no criteria are added, the target audience includes everyone.
- When you create a target audience using demographic criteria such as city, age, gender, membership status, and so on, only the users who satisfy criteria based on their current data are included in the target audience.
- Previously defined segments, events, and data views can be selected as criteria.

  Note: You must define a login event type if you have tasks that depend on segments with data from logged-in users.

  > **TIP** The attributes of the events or data views added to the targeting criteria can be selected as values for personalization variables by navigating to **Content** ⇨ **Personalization**. For more information about delivering personalized content, see "Personalizing HTML Creatives" on page 630.

- You can use customer lists that have been imported from other sources, such as SAS Marketing Automation.
- When you add **Browser and Device** to your criteria, only the people who are using that browser or device during the current session are included in the target audience. For example, if you add Chrome as the browser, only the people who are using Chrome during the current session are eligible to be included in the target audience.

To add criteria:

1. Click **Eligible** or **Exclusions**.
2. Click + to add a criteria row.
3. In the **Specify criteria** box, click .
4. In the **Select Criteria** window, select the criteria to add.

   To locate criteria, use these options:

   - Click to display a hierarchical folder view of criteria. Click to display individual merge tags in alphabetical order.
   - Click to expand all of the folders. Click to collapse all of the folders.
   - Click to view details, if available, about the criteria.
   - Search for criteria by entering the name in the **Search** field. Select criteria and click to display details.
5. Click **OK**.
6. If applicable, in the **Specify values** box, click and specify a value for the criteria.

   For example, if channel is your selected criterion, you might specify a value of mobile or web. Whereas, there is no need to specify a value if a segment is selected.
7. Repeat steps 1-6 to add criteria.
8. Use these options to work with the criteria list:

   - Click to view a summary of the criteria.

- Click to make a copy of the criteria. Copying criteria saves steps when you use the same criteria but supply different values.
- Click or to move criteria up or down in the list. The position determines the order in which the criteria are checked.
- Click to create a group for a set of criteria. Groups enable you to nest criteria.
- Click to delete criteria.

9 Select **All of the following** to include members who meet all of the criteria in a group. Or, select **Any of the following** to include members who meet one or more of the criteria in a group.

10 Click .

Mobile Device and Cell Service Attributes

To define your target audience, you can select these mobile device attributes in addition to other criteria:

- Mobile App Version. This value is extracted from native APIs, or it can be specified by `setApplicationVersion` in the mobile SDK. For more information, see "Determine the Mobile App Version" on page 412.
- Mobile Application Name
- Mobile Device Manufacturer
- Mobile Device Model
- Mobile Device Type. The attribute values are *Phone* or *Tablet*.
- Mobile Platform. The attribute values are *iOS* or *Android*.
- Mobile Platform Version
- Mobile Screen Height
- Mobile Screen Width

Cell service attributes are available only on devices that have mobile data access. You can select these cell service attributes:

- Mobile Carrier Name
- Mobile Country Code
- Mobile Network Code

Set Metrics

About Metrics

Metrics measure events that the system can detect such as a person clicking on a spot on a device. On the **Insights** tab, add primary and secondary metrics to measure the success of the content being delivered by the task.

A primary metric is the leading measure for the success of the task. A secondary metric measures other benchmarks that you are interested in. A task must have one primary metric. A task can have multiple secondary metrics. Each secondary metric can have only one data view or event.

In-app message tasks are an effective way to use both primary and secondary metrics. For example, primary metrics such as Button Press 1 and Button Press 2 can track desired customer responses. Examples of secondary metrics are Button Press 3 and Message Dismiss. In this example, Button Press 3 indicates a closed message and can track the opposite customer response; Message Dismiss indicates that the customer has clicked away from the message.

You can evaluate the effectiveness of the in-app message by determining whether the message was dismissed. A secondary metric with a default value of Message Dismiss is created when content is added to an in-app message task.

By default, a primary metric is created when content is added to a task.

Set a Primary Metric

The primary metric measures conversions to determine the success of the task. There can be only one primary metric. You can either edit an existing primary metric or add a new one and then remove the previous metric.

1 Click **+**.

2 Select the criteria that you want to add. You can select an event view or a data view.

   For more information about events, see “User-Defined Events” on page 304. For more information about data views, see “About Data Views” on page 459.

3 If attributes are defined for the event or data view, select the attribute conditions that must be met. For example, for a Click Through metric, you can select a particular creative as an attribute condition. The primary metric would be a click-through response to that creative.

   Note: Attributes are joined by an AND operator. Make sure that you do not define conflicting attributes that result in a condition that cannot be met.

4 To mark this selection as a contact or response that can be tracked and used for reporting and future targeting, select **Classify this selection**. Classifying an event or data view enables you to compare contacts and responses across creatives and channels. You can personalize future messages and creatives. You can also use the information to segment customers. You can classify events and data views in both primary and secondary metrics.

To record the number of times that a customer interacts with a creative or a spot, select **Mark this selection as a contact**. This information is available as contact history for SAS Marketing Automation, SAS Real-Time Decision Manager, and other applications.

To mark this selection as a response to a creative, select **Mark this selection as a response**.

5 Select **Stop delivery after conversion** to stop delivering creatives when the primary metric for the task is met.

When delivery of the creatives stops, that same spot might switch to displaying creatives from another task. If there is no other task delivering a creative to that spot, then the spot's default creative is displayed. If there are no other tasks delivering content to that spot and there is no default content defined for that spot, then the spot is empty.

Set Secondary Metrics

A secondary metric measures other benchmarks that you are interested in. A task can have multiple secondary metrics. Each secondary metric can have only one data view or event.

Click **Add Secondary Metric** to add a secondary metric.

Modify Existing Metrics

You can change the settings for an existing metric.

Note: The action icons for a metric are only visible when the metric has focus. For example, a metric has focus when you tab to it or when you move your mouse over the metric.

- Click to update the metric details.
- Click to remove a metric.

Set the Trigger Event for Your Task

1 Navigate to **Orchestration** ⇨ **Trigger Event.**

2 Select the event to trigger the task, and then click **OK**.

Set the Priority of Your Task

Multiple tasks might compete for the same resources. For example, you might create two mobile in-app message tasks that deliver content using the same trigger event.

When this happens, the system needs to know which task to deliver to the user. For this reason, tasks must be assigned a priority.

Here are the rules for how relative priority is determined:

- Priority is set relative to other tasks of the same type.
- Priority is set based on a scale of 1 to 5, where 1 is the highest priority and 5 is the lowest priority. The default priority is 3. You can change the priority.

  Note: A/B test tasks have a priority of Test, which is a higher priority than tasks that are not A/B tests. You cannot change the priority of an A/B test task.
- If the priority of two or more tasks of the same type is the same and a user qualifies for both, the system randomly chooses the task to deliver.

To set the priority of a task:

1 Navigate to the **Orchestration** ⇨ **Priority** tab.

2 Select the number that represents the task's priority over all other tasks that compete for the same resource.

  Note: If an A/B test task exists that competes for the same resource, the A/B test task delivers its content regardless of the priority that you set here.

View Usage Information

From the **Orchestration** ⇨ **Usage** tab, you can view which items use the task and the items that the task uses.

The ability to view dependencies between items enables you to see the items that a task depends on to work successfully. Usage information helps you identify how changes that you make to one item might affect another item.

Items That Use the Task

The first section shows the items that use the task. For example, if the task is used in an activity, the activity is included in the list.

The Channel, Priority, and Type columns do not apply to activities and are therefore empty.

Items That the Task Uses

The second section shows items that the task uses.

- Click **Directly Related** to list the items that the task uses. For example, if a task uses a creative, the creative is included in the list.
- Click **All Related** to view directly related items as well as any items that those directly related items use. For example, you might see the creative that the task uses and the asset that is used by the creative.

  The list displays items with a Designing, Ready, or Active status. Click **Show Designing Status only** to display only items with a Designing status.

To open an item, click the item. To view item details and to open the item, click *i* in the item's row.

Note: HTML assets that are the content source for mobile spot, web spot, and email creatives are not listed.

Schedule and Start Your Task

When you finish updating your task, you can mark the task ready, publish the task immediately, or set a schedule for the task.

Note: When you schedule a bulk email task, a bulk mobile push notification task, or a direct marketing task, allow a minimum of five minutes between the time you publish the task and the scheduled start time for the task to be active. This time delay is needed by the system to process the request.

On the **Orchestration** tab, take these actions:

- Click **No schedule** if you plan to publish the task manually.
- Click **Set a schedule** to set a time period that the task is active.
    - Select a time zone. For example, you might want to select a time zone that is different from the default if the task is targeted to a specific locale. By default, the time zone is the same as the time zone that is set for the tenant. If a valid time zone is not set for the tenant, the default time zone is UCT.
    - Click **Single occurrence** to specify a single time span that the task is active.
    - Select a start date and an end date for the task.

      Note: If you select **Single occurrence**, the start date cannot be edited after the task is published.
    - Click **Recurrence** to specify a recurring task. Click .

      Specify these details for a recurring schedule:
        - **Start time** is the start time for the first occurrence.
        - **Duration** specifies the amount of time that the content is available for each occurrence. For example, a task might start every week on Monday, and continue for four days.
        - **Frequency** specifies that the schedule for the recurrence. If you click **Weekly**, click the day for each occurrence. You can select multiple days in each week. If you click **Monthly**, select the numbered day or the weekday for the recurrence. For example, you can select the 10th day of each month or the second Tuesday of each month.

          Note: You can edit the weekly or monthly frequency after the task is published and the start date has passed. The recurrence must occur within the start and end dates.
        - **Range of recurrence** specifies the start and end dates, or that the recurrence continues without an end date.
    - **Extend metrics analysis** continues collecting data after the last occurrence. Select the number of days to extend data collection. The default value is 7 days. For example, if you use the default value, and the **Start time** is 9:00 PM, data collection continues until 9:00 PM seven days after the **End by** date.

      Customers might respond several days after the last occurrence. You can extend the time for data collection in order to more effectively measure task performance.

During the extended period of data collection, the status is Active - Metrics Only. The status changes to Complete when the **Extend metrics analysis** period is over.

- Select **Mark Ready** to change the status from Designing to Ready. A Ready status indicates that this item is ready to be published. When you are ready to promote an item from a Ready status to an Active status, click **Publish**.

  Note: When you publish an item, you are prompted to publish any dependent items that are marked Ready.

  Items with a Ready status can be changed back to a Designing status by clicking **Return to Designing**. Changing this status to Designing prevents the item from being published.

  Note: If your item has a Ready status and a start date, the item is not automatically published when the start date is reached. For example, if you are creating a task, it must be published in order for the start date to activate the task.

- Select **Mark Ready and Publish** to change the status from Designing to Active. Items with an Active status cannot be changed back to Designing.

Changes to a scheduled or active task are not automatically propagated to the published version of the task. You must republish the task after you save it to resolve the Out of Sync status. Otherwise, the task stays out of sync with the published version and the updates are not delivered.

When the end date of a task is reached, its status changes to Complete. Completed tasks cannot be modified. The task stops any associated data collection and makes the task's content unavailable. In addition, any unsaved changes are lost.

Note: A recurring schedule is not available if the task is included in an activity.

Pause the Task

You can pause an active task to temporarily stop delivery of a task. For example, if you want to correct the percentage of a discount that is offered, you can pause the task, edit the amount, and republish. You do not need to end a task in order to update the content. You can make the same changes to a paused task that you can make to an active task.

When a task is paused, you can resume the task to restart content delivery or end the task.

To pause an active task, select **Pause** on the **Orchestration** tab.

During the time that a task is paused, content is no longer delivered. Customers are not selected by the task. Data such as conversions continues to be collected based on impressions that were viewed prior to the pause. When the task resumes, new data is added to the data that was collected before the pause.

Content delivery that does not rely on a trigger and is in progress, such as bulk mobile push notifications, might continue for items that are already in the queue.

If the task is paused and the content has not changed, select **Resume** to make the task active again.

If task content is changed and saved, the task becomes out of sync. Select **Republish** to make the task active again and to deliver the updated content.

End the Task

While your task is running, it collects data and gathers information about progress toward your goals. Navigate to the **Insights** tab to check the progress of your task.

Click **End** on the **Orchestration** tab when you no longer need the task to run or when the scheduled end date is reached. The status changes from Active to Completed. Completed tasks do not collect new data, do not deliver content to a spot, and cannot be modified. Any unsaved changes to the task are lost.

Add Properties to Your Task

There are two types of properties that are associated with a task:

Properties that Identify the Task

Examples of properties that identify the task include **Description** and **Code**. To update task properties, click the **Properties** tab and modify the values in the fields as desired.

An item can be identified by its code for activities such as auditing and reporting. When an item is imported or migrated to SAS Customer Intelligence 360, the existing code value for the item is retained. Depending on the code settings for your environment, the code value might be editable. This value is not required to be unique to be valid. If the value is editable, you can change it to match the code value for another item. Valid characters for codes are alphanumeric characters, multi-byte characters, numerals, underscores, hyphens, and periods. Blank spaces are not allowed in code formats.

The **Code** field enables marketers to use a segment map to target customers based on their internal attributes (account type, balance, and so on) and their previous interactions. These codes are used to communicate information about the targeted customers to vendors or downstream systems. Using codes can minimize errors in text and punctuation that might occur when using an item name that is typically lengthy.

The information in the **Code** field can be used for operational reporting. The information can also be used to select or suppress customers for targeting messages (for example, a marketing message might target or exclude all customers who responded to direct marketing task *12345*).

Properties Used for Plans

To add planning information to a task, open the task and click . For more information, see “Creating a Planning Item” on page 259.

To return to the task view after opening the planning view, complete one of these actions:

- Fill out the required planning properties and save the task.
- Navigate to the **Tasks** view and click the task from the list.

Creating Mobile Push Notification Tasks

Push messages are notifications that are displayed while the user is not active in the application itself.

Add Content to Your Task

All of the details and items associated with the content that your task delivers are specified on the **Content** tab. In the properties pane of the **Content** tab, use the icons to change the spot, message, and creatives that the task uses. You can also set the distribution and impression limits for the creatives or add targeting criteria to each creative associated with the task.

Add a Mobile Push Notification Task

1 From the navigation bar, click **Tasks**.

2 Click and select **Push Notification** to deliver content to a mobile application.

3 You can determine whether the task delivers all content at the same time or when event conditions are met. Select a delivery type to specify how the task delivers content:

- Click **Bulk** to deliver messages at the same time. You specify the schedule on the **Orchestration** tab. A bulk task can be used as the Start task in an activity.
- Click **Triggered** to add a trigger event. You can add a trigger event on the **Trigger** page on the **Orchestration** tab. You can also specify criteria and values to add attribute conditions for the event. Content is delivered when all of the conditions are met.

4 Select the application where the message will be delivered. Click **Create Task**.

Add Message or Creatives

1 Click on the **Content** tab.

2 Click **Select Content** to add a message or creative to the task. You can either choose to add an existing message or creative, or you can click **New Message** or **New Creative** to create a message or creative. The message or creative that you create is automatically added to the task.

CAUTION! Select only event attributes for creatives that are in triggered mobile push notifications. When creatives are used in triggered mobile push notifications, merge tags can only use event attributes. Values that are from other data sources, such as the data hub, will not be resolved.

Set Distribution of Content

If this task contains more than one creative, you can refine how each creative is displayed. Click to open the **Distribution** tab and select the method that you want the task to use when determining how to display content.

Frequency Distribution

Select **Frequency** to specify how often a creative is displayed compared with the other creatives in this task. Next, set a percentage for each creative.

Note: Frequency is the default distribution method. By default, each creative is assigned equal distribution.

Sequential Distribution

Select **Sequential** to set the order in which the creatives are displayed.

CAUTION! The order is reset every 24 hours. After 24 hours the order is reset, and the first creative in the sequence is selected again. If the content delivery schedule for your task is longer than 24 hours, the creatives might not be displayed in the order that you have specified.

Rule-based Distribution

Select **Rule-based** to split a task's target audience into subgroups and associate a creative with each subgroup, thereby personalizing the content that your target audience sees. You can assign different criteria to each creative so that you can decide which creatives are delivered to different subgroups of the target audience.

Note: When you select the rule-based option, the criteria that you add to each creative are applied after the criteria on the **Targeting** tab are applied. Think of rule-based criteria as a way of refining which members of the task's target audience see specific creatives.

Each creative is assigned a number that indicates the order in which the creative's targeting criteria are evaluated. The creative that has the number 1 associated with it is evaluated first. The first creative with criteria that match a user is the creative that is delivered to that user. As a result, any creatives that come after the matching creative are not evaluated.

You can change the numbers that are associated with a creative by changing the position of the creative in the list. To change the creative order:

1 Click from the **Distribution** tab.

2 Select the creative that you want to move.

3 Click the arrows to move the creative up or down in the list.

A best practice is to ensure that there is always a creative that is displayed in your spot. For web and mobile spot tasks, there are two ways to ensure that a spot that this task delivers content to is never empty.

- Your task includes a spot that contains a default creative.
- The creative in the rule-based creatives list that comes last (that is, the creative associated with the highest number) does not contain additional targeting. A

creative that is listed last and does not have additional criteria associated with it is displayed when none of the previous criteria match the task's audience member.

The creative that does not contain additional criteria becomes the default creative for this task. The default creative is denoted by . As a result, any creatives listed after the default creative are never delivered.

Note: When you create a mobile in-app message or mobile push notification, you must denote one creative as the default creative.

To add targeting criteria to each creative, select the creative and follow these steps:

- Select **All of the following** to include members who meet all of the criteria in a group. Or, select **Any of the following** to include members who meet one or more of the criteria in a group.
- Click to view a summary of the criteria.
- Click to make a copy of the criteria.
- Click or to move criteria up or down in the list.
- Click to create a group for a set of criteria.
- Click to add criteria. In the **Select Criteria** window, select the criteria to add. In addition, you can use customer lists that have been imported from other sources, such as SAS Marketing Automation.

  Note: For mobile in-app, mobile spot, and web targeting, when you add **Browser and Device** to your criteria, only the people who are using that browser or device during the current session are included in the target audience. For example, if you add Chrome as the browser, only the people who are using Chrome during the current session are eligible to be included in the target audience.

  When you add a spot attribute that contains a URL query string parameter, the value of that parameter needs to be decoded for multi-byte character sets (MBCS). If you are adding a URL query string, the value should be encoded for MBCS.

Example: Greet Travelers in Their Own Language

In this example, a mobile marketer at an airport sends a push notification to each traveler who enters the airport. The language of the push notification is based on the language setting of the traveler's device. The mobile app responds to geofences. A geofence named "airport" has been defined in SAS Customer Intelligence 360.

1. From the navigation bar, click **Messages**. Click to create a new message.
2. Click **New Creative** and **Mobile Push Notification** to add three creatives to the message.

   Each creative contains "Welcome to Our Airport!" notification text in a different language. One creative is in German, one creative is in Chinese, and one creative is in English.
3. From the navigation bar, click **Tasks**. Click to create a new task. Click **Push Notification** and **Triggered**. Select an application and click **Create Task**.
4. In the task, click **Select Content** and select the message that you created.

5 Click **Select all creatives**.

6 Click and select **Rule-based**.

7 Click .

The marketer selects the German language creative and specifies that the Browser Language is German in the criteria. For the Chinese language creative, the Browser Language is Chinese.

If the browser language is neither German nor Chinese, the push notification message is in English. The marketer moves the English language creative to priority 3 in the list.

8 On the **Orchestration** tab, select **Trigger**. Select a Geofence Entered event as the trigger. Specify **airport** as the Geofence Name.

Set Impression Limits

Click to limit the number of times a customer sees your content.

- Select **Limit total impressions per user** to specify the total number of times a creative is displayed to a customer. This limit is valid for the duration of this task.
- Select **Limit impressions per user by time period** to specify the maximum number of impressions that a user sees during a specified time interval (for example, minutes, hours, days, or months).

Add a Trigger Event

To add a trigger event to a triggered task:

1 On the **Orchestration** tab, click **Trigger**.

2 Click and select an event.

3 Click +. Specify criteria and values to add attribute conditions for the event.

The attributes that you add are based on the attributes that are associated with the original event. Attributes that you modify do not affect the attributes for the event itself. The attributes in this panel affect how the event is processed for this trigger only.

The task delivers content when all of the attribute conditions are met.

Add a Target Audience

On the **Targeting** tab, set the criteria that define the target audience for the content that the task delivers.

On the **Eligible** page, you can specify which people to include in your target audience. On the **Exclusions** page, you can specify which people to exclude from your target audience. The **Exclusions** page is not available for bulk tasks.

Note the following rules about defining the target audience:

- For triggered tasks, if no criteria are added, the target audience includes everyone. For bulk tasks, you can select only one criterion. If you do not select a criterion, no content is delivered.
- When you create a target audience using demographic criteria such as city, age, gender, membership status, and so on, only the users who satisfy criteria based on their current data are included in the target audience.
- Previously defined segments, events, and data views can be selected as criteria.

  Note: You must define a login event type if you have tasks that depend on segments with data from logged-in users.

  > **TIP** The attributes of the events or data views added to the targeting criteria can be selected as values for personalization variables by navigating to **Content** ⇨ **Personalization**. For more information about delivering personalized content, see "Personalizing HTML Creatives" on page 630.

- You can use customer lists that have been imported from other sources, such as SAS Marketing Automation.

To add criteria:

1. For triggered tasks, click **Eligible** or **Exclusions**.
2. Click + to add a criteria row.
3. In the **Specify criteria** box, click .
4. In the **Select Criteria** window, select the criteria to add.

   To locate criteria, use these options:

   - Click to display a hierarchical folder view of criteria. Click to display individual merge tags in alphabetical order.
   - Click to expand all of the folders. Click to collapse all of the folders.
   - Click to view details, if available, about the criteria.
   - Search for criteria by entering the name in the **Search** field. Select criteria and click to display details.
5. Click **OK**.
6. If applicable, in the **Specify values** box, click and specify a value for the criteria.

   For example, if channel is your selected criterion, you might specify a value of mobile or web. Whereas, there is no need to specify a value if a segment is selected.
7. For triggered tasks, repeat steps 1-6 to add criteria.
8. Use these options to work with the criteria list:

   - Click to view a summary of the criteria.
   - For triggered tasks:
     - Click to make a copy of the criteria. Copying criteria saves steps when you use the same criteria but supply different values.

- Click or to move criteria up or down in the list. The position determines the order in which the criteria are checked.
- Click to create a group for a set of criteria. Groups enable you to nest criteria.
- Click to delete criteria.

9 Select **All of the following** to include members who meet all of the criteria in a group. Or, select **Any of the following** to include members who meet one or more of the criteria in a group.

10 Click .

Target Audience Data and Personalization

Depending on the selected target audience for a bulk push notification task (customer data) or a triggered push notification task (trigger event data), data items from the recipient data in transient files are available for selection as merge tags for personalization.

For a bulk push notification task, you can select recipients from one of these sources:

- a segment that is created from existing customer data
- an imported list
- a transient file that contains data in temporary tables

For personalizing content, select from the merge tags that are listed in the **Target File** folder. The folder contains customer data from the selected target audience (in this case, the transient file). A selected merge tag has this syntax:

```
%%DATAHUB.TARGET.<data item>%%
```

Note: Customer Identities (subject IDs) that are contained in the transient file must already be mapped in the data hub before you use the transient file.

For more information, see “Select a Merge Tag” on page 573.

All mobile app users who have opted in for push notifications via their device settings, and who meet the eligibility criteria, receive push notifications if their device ID is available from the database.

Mobile Device and Cell Service Attributes

To define your target audience, you can select these mobile device attributes in addition to other criteria:

- Mobile App Version. This value is extracted from native APIs, or it can be specified by `setApplicationVersion` in the mobile SDK. For more information, see “Determine the Mobile App Version” on page 412.
- Mobile Application Name
- Mobile Device Manufacturer

- Mobile Device Model
- Mobile Device Type. The attribute values are *Phone* or *Tablet*.
- Mobile Platform. The attribute values are *iOS* or *Android*.
- Mobile Platform Version
- Mobile Screen Height
- Mobile Screen Width

Cell service attributes are available only on devices that have mobile data access. You can select these cell service attributes:

- Mobile Carrier Name
- Mobile Country Code
- Mobile Network Code

Set Metrics

Metrics measure events that the system can detect. For example, the system can detect certain events such as a person clicking a spot on a web page. Add metrics to measure the success of the content being delivered by the task.

Set a Primary Metric

The primary metric measures conversions to determine the success of the task. There can be only one primary metric. You can either edit an existing primary metric or add a new one and then remove the previous metric.

1. Click **+**.
2. Select the criteria that you want to add. You can select an event view or a data view.

   For more information about events, see "User-Defined Events" on page 304. For more information about data views, see "About Data Views" on page 459.
3. If attributes are defined for the event or data view, select the attribute conditions that must be met. For example, for a Click Through metric, you can select a particular creative as an attribute condition. The primary metric would be a click-through response to that creative.

   Note: Attributes are joined by an AND operator. Make sure that you do not define conflicting attributes that result in a condition that cannot be met.
4. To mark this selection as a contact or response that can be tracked and used for reporting and future targeting, select **Classify this selection**. Classifying an event or data view enables you to compare contacts and responses across creatives and channels. You can personalize future messages and creatives. You can also use the information to segment customers. You can classify events and data views in both primary and secondary metrics.

   To record the number of times that a customer interacts with a creative or a spot, select **Mark this selection as a contact**. This information is available as contact history for SAS Marketing Automation, SAS Real-Time Decision Manager, and other applications.

To mark this selection as a response to a creative, select **Mark this selection as a response**.

5 Select **Stop delivery after conversion** to stop delivering creatives when the primary metric for the task is met.

When delivery of the creatives stops, that same spot might switch to displaying creatives from another task. If there is no other task delivering a creative to that spot, then the spot's default creative is displayed. If there are no other tasks delivering content to that spot and there is no default content defined for that spot, then the spot is empty.

Set Secondary Metrics

A secondary metric measures other benchmarks that you are interested in. A task can have multiple secondary metrics. Each secondary metric can have only one data view or event.

Click **Add Secondary Metric** to add a secondary metric.

Modify Existing Metrics

You can change the settings for an existing metric.

Note: The action icons for a metric are only visible when the metric has focus. For example, a metric has focus when you tab to it or when you move your mouse over the metric.

- Click to update the metric details.
- Click to remove a metric.

View Usage Information

From the **Orchestration** ⇨ **Usage** tab, you can view which items use the task and the items that the task uses.

The ability to view dependencies between items enables you to see the items that a task depends on to work successfully. Usage information helps you identify how changes that you make to one item might affect another item.

Items That Use the Task

The first section shows the items that use the task. For example, if the task is used in an activity, the activity is included in the list.

The Channel, Priority, and Type columns do not apply to activities and are therefore empty.

Items That the Task Uses

The second section shows items that the task uses.

- Click **Directly Related** to list the items that the task uses. For example, if a task uses a creative, the creative is included in the list.

- Click **All Related** to view directly related items as well as any items that those directly related items use. For example, you might see the creative that the task uses and the asset that is used by the creative.

  The list displays items with a Designing, Ready, or Active status. Click **Show Designing Status only** to display only items with a Designing status.

To open an item, click the item. To view item details and to open the item, click in the item's row.

Note: HTML assets that are the content source for mobile spot, web spot, and email creatives are not listed.

Schedule and Start Your Task

When you finish updating your task, you can mark the task ready, publish the task immediately, or set a schedule for the task.

On the **Orchestration** tab, perform these actions:

- Click **No schedule** if you plan to publish the task manually.
- Click **Set a schedule** to set a time period that the task is active.
  - Select a time zone. For example, you might want to select a time zone that is different from the default if the task is targeted to a specific locale. By default, the time zone is the same as the time zone that is set for the tenant. If a valid time zone is not set for the tenant, the default time zone is UCT.
  - Click **Single occurrence** to specify a single time span that the task is active.
  - Select a start date and an end date for the task.

    Note: If you select **Single occurrence**, the start date cannot be edited after the task is published.
  - Click **Recurrence** to specify a recurring task. Click .

    Specify these details for a recurring schedule:
    - **Start time** is the start time for the first occurrence.
    - **Frequency** specifies the schedule for the recurrence. If you click **Weekly**, click the day for each occurrence. You can select multiple days in each week. If you click **Monthly**, select the numbered day or the weekday for the recurrence. For example, you can select the 10th day of each month or the second Tuesday of each month.

      Note: You can edit the weekly or monthly frequency after the task is published and the start date has passed. The recurrence must occur within the start and end dates.
    - **Range of recurrence** specifies the start and end dates, or that the recurrence continues without an end date.
  - **Extend metrics analysis** continues collecting data after the last occurrence. Select the number of days to extend data collection. The default value is 7 days. For example, if you use the default value, and the **Start time** is 9:00 PM, data collection continues until 9:00 PM seven days after the **End by** date.

Customers might respond several days after the last occurrence. You can extend the time for data collection in order to more effectively measure task performance.

During the extended period of data collection, the status is Active - Metrics Only. The status changes to Complete when the **Extend metrics analysis** period is over.

- Select **Mark Ready** to change the status from Designing to Ready. A Ready status indicates that this item is ready to be published. When you are ready to promote an item from a Ready status to an Active status, click **Publish**.

  Note: When you publish an item, you are prompted to publish any dependent items that are marked Ready.

  Items with a Ready status can be changed back to a Designing status by clicking **Return to Designing**. Changing this status to Designing prevents the item from being published.

  Note: If your item has a Ready status and a start date, the item is not automatically published when the start date is reached. For example, if you are creating a task, it must be published in order for the start date to activate the task.

- Select **Mark Ready and Publish** to change the status from Designing to Active. Items with an Active status cannot be changed back to Designing.

Changes to a scheduled or active task are not automatically propagated to the published version of the task. You must republish the task after you save it to resolve the Out of Sync status. Otherwise, the task stays out of sync with the published version and the updates are not delivered.

When the end date of a task is reached, its status changes to Complete. Completed tasks cannot be modified. The task stops any associated data collection and makes the task's content unavailable. In addition, any unsaved changes are lost.

Note: A recurring schedule is not available if the task is included in an activity.

Pause the Task

You can pause an active task to temporarily stop delivery of a task. For example, if you want to correct the percentage of a discount that is offered, you can pause the task, edit the amount, and republish. You do not need to end a task in order to update the content. You can make the same changes to a paused task that you can make to an active task.

When a task is paused, you can resume the task to restart content delivery or end the task.

To pause an active task, select **Pause** on the **Orchestration** tab.

During the time that a task is paused, content is no longer delivered. Customers are not selected by the task. Data such as conversions continues to be collected based on impressions that were viewed prior to the pause. When the task resumes, new data is added to the data that was collected before the pause.

Content delivery that does not rely on a trigger and is in progress, such as bulk mobile push notifications, might continue for items that are already in the queue.

If the task is paused and the content has not changed, select **Resume** to make the task active again.

If task content is changed and saved, the task becomes out of sync. Select **Republish** to make the task active again and to deliver the updated content.

End the Task

While your task is running, it collects data and gathers information about progress toward your goals. Navigate to the **Insights** tab to check the progress of your task.

Click **End** on the **Orchestration** tab when you no longer need the task to run or when the scheduled end date is reached. The status changes from Active to Completed. Completed tasks do not collect new data, do not deliver content to a spot, and cannot be modified. Any unsaved changes to the task are lost.

Add the Task to an Activity

To publish the task, you have to associate it with an activity.

For more information, see “About Activities”.

Add Properties to Your Task

There are two types of properties that are associated with a task:

Properties that Identify the Task

Examples of properties that identify the task include **Description** and **Code**. To update task properties, click the **Properties** tab and modify the values in the fields as desired.

An item can be identified by its code for activities such as auditing and reporting. When an item is imported or migrated to SAS Customer Intelligence 360, the existing code value for the item is retained. Depending on the code settings for your environment, the code value might be editable. This value is not required to be unique to be valid. If the value is editable, you can change it to match the code value for another item. Valid characters for codes are alphanumeric characters, multi-byte characters, numerals, underscores, hyphens, and periods. Blank spaces are not allowed in code formats.

The **Code** field enables marketers to use a segment map to target customers based on their internal attributes (account type, balance, and so on) and their previous interactions. These codes are used to communicate information about the targeted customers to vendors or downstream systems. Using codes can minimize errors in text and punctuation that might occur when using an item name that is typically lengthy.

The information in the **Code** field can be used for operational reporting. The information can also be used to select or suppress customers for targeting messages (for example, a marketing message might target or exclude all customers who responded to direct marketing task *12345*).

Properties Used for Plans

To add planning information to a task, open the task and click . For more information, see "Creating a Planning Item" on page 259.

To return to the task view after opening the planning view, complete one of these actions:

- Fill out the required planning properties and save the task.
- Navigate to the **Tasks** view and click the task from the list.

Monitor Your Mobile Task

Use the **Insights** tab to monitor the success of your task after it has been published.

Mobile In-App Message Tasks

Summary

The **Summary** section displays information about conversion rates and the effectiveness of creatives. The conversion rate is the percentage of users who meet the primary metric. The **Creative Performance** section displays the conversion rate and lift for the creatives.

Move the sliders below the Creative Conversion Rate graph to view the conversion rate for a specific time period. Select **Show value markers** to add data points to the lines in the graph.

Performance

The **Performance** section displays the number of unique users and unique conversions, and the conversion rates for the primary and secondary metrics.

Reports

The **Reports** section displays information about the performance of your mobile in-app messages. Select a date range from the slider to filter the information by a time period for each section.

Select the **Attempted**, **User Actions**, or **Response Rate** tab to view sections of the report. Select the **Date**, **Hour**, **Weekday**, or **Month** below the bar charts to display the information by a unit of time.

- The **Attempted** tab displays information about the total number of in-app messages sent to the messaging services for Apple and Google. The following results are displayed:

  - The **Attempted (Total)** is the total number of the in-app messages sent.
  - The **Responses (Total)** is the total number of times the in-app messages are tapped by mobile users.

- The **User Actions** tab displays the total number of in-app messages attempted, the number of times that the users tapped each button, and the number of times the users dismissed the messages.

  The following results are displayed for mobile messages that use the large template:

  - The **Attempted (Total)** is the total number of the in-app messages sent.
  - The **Button 1 Tapped (Total)** is the total number of times Button 1 in the in-app message is tapped by mobile users.
  - The **Button 2 Tapped (Total)** is the total number of times Button 2 in the in-app message is tapped by mobile users.
  - The **Button 3 Tapped (Total)** is the total number of times Button 3 in the in-app message is tapped by mobile users.
  - The **Dismissed (Total)** is the total number of times users dismiss the in-app messages.

  The following results are displayed for mobile messages that use the small template:

  - The **Attempted (Total)** is the total number of the in-app messages sent.
  - The **Banner Tapped (Total)** is the total number of times the banner in the in-app message is tapped by mobile users.
  - The **Dismissed (Total)** is the total number of times users dismiss the in-app messages.

- The **Response Rate** tab indicates the effectiveness of the in-app message based on the percentage of users who opened the notification to learn more about its content.

  The following results are displayed for mobile messages that use the large template:

  - The **Button 1 Response Rate (Total)** compares the total number of times Button 1 is tapped with the total number of messages attempted for in-app messages.
  - The **Button 2 Response Rate (Total)** compares the total number of times Button 2 is tapped with the total number of messages attempted for in-app messages.
  - The **Button 3 Response Rate (Total)** compares the total number of times Button 3 is tapped with the total number of messages attempted for in-app messages.

  The following result is displayed for mobile messages that use the small template:

  - The **Response Rate (Total)** compares the total number of times the banner is tapped with the total number of messages attempted for in-app messages.

Mobile Spot Tasks

Summary

The **Summary** tab displays general information about the task and its creatives, giving you an at-a-glance view of how the task is progressing. The data here is based on unique users. For example, if you visit a site twice, your duplicate visits are removed and you are counted as one user.

You can see details about the task, such as the following information:

- status of the task
- dates, such as the date on which the task was last published, the date of the most recent update, and how long the task has been active
- population counts, such as the number of unique users that have been included in the task

On the **Summary** tab, you can also see some details about creative performance, such as the following information:

- Data for each creative, including unique user counts and conversion rates.
- The conversion rate for the primary metric for the task's creative. Use the **Creative Conversion Rate** section to explore data related to the creative's conversion rate. You can select **Show value markers** to add data points to the lines in the graph, and refine the time period that the graph displays by moving the sliders below the graph.

Performance

Performance is where you specify the primary and secondary metrics while you are designing your task. As the task progresses, details about all available metrics and creative performance are updated on this tab. The data available on this tab is user based and includes only unique users. For example, if you visit a site twice, your duplicate visits are removed and you are counted as one user.

In addition to viewing metric and creative data, the tab also includes an option to stop delivering creatives when the primary metric for the task is met. If this is selected and this task stops delivering creatives, any of the following actions might occur:

- That same spot might display a creative from another task.
- If there is no other task delivering a creative to that spot, then the spot's default creative is displayed.
- If there are no other tasks delivering content to that spot and there is no default content defined for that spot, then the spot remains empty.

Report

Use the User Results report to display how key metrics are performing by total users in your task. The user-based metrics in this report include duplicate users. For example, if you visit a site twice, you are counted as two users.

Use the date slider to specify the range of dates for the data that you want to see. The dates are the beginning dates and end dates for the data that is available for the test task. For more information about using the report and the data in the report, click **Get more report details**.

Select the following tabs to display information:

- Click the **Overview** tab to see how key metrics performed by total users in the task.

  For each metric on this tab, click the **View Metric Formula** link to display the definition and the formula for the metric. The following metrics are displayed on this tab:

  - Impressions delivered is the total number of times that a creative is delivered to all users.
  - Impressions viewable is the total number of times that a creative is delivered and viewable by all users.
  - Conversions is the total number of times that the users satisfy the primary metric.
- Click the **Conversion Ranks** tab to display the creatives, dates, devices, and mobile operating systems with the most and fewest number of conversions.
- Click the **Impressions/Conversions** tab to display the pattern of user behavior by impressions delivered, impressions viewable, and conversions for each creative.
- Click the **Cumulative Impressions/Conversions** tab to display the cumulative count of conversions, impressions delivered, and impressions viewable for each creative.
- Click the **Conversion Counts** tab to display which variant, device, and mobile operating system generated the most conversions.
- Click the **Conversions Over Time** tab to display the trend of conversions by creative, device, and mobile operating system over time.
- Click the **Mobile OS** tab to display the total conversions by mobile operating system and the pattern of conversions that were generated using each operating system over time.
- Click the **Devices** tab to display the total conversions by device type and the pattern of conversions that were generated using each device over time.

Mobile Push Notification Tasks

Summary

The **Summary** section displays information about conversion rates and the effectiveness of creatives. The conversion rate is the percentage of users who meet the primary metric. The **Creative Performance** section displays the conversion rate and lift for the creatives.

Move the sliders below the Creative Conversion Rate graph to view the conversion rate for a specific time period. Select **Show value markers** to add data points to the lines in the graph.

Performance

The **Performance** section displays the number of unique users and unique conversions, and the conversion rates for the primary and secondary metrics.

Real-Time

The **Real-time** section displays information about mobile push notifications that were sent and opened during the preceding 24 hours for this task. This section is visible only when the task is active. For more information, see "Real-Time Push Notification Task Performance Report" on page 795.

Reports

The **Reports** section displays information about the performance of your mobile push notification task. Select a date range from the slider to filter the information by a time period for each section.

Select the **Sent**, **Opened**, or **Response Rate** tab to view sections of the report. Select the **Date**, **Hour**, **Weekday**, or **Month** below the bar charts to display the information by a unit of time.

- The **Sent** tab displays information about the total number of mobile push notifications sent to the push notification services for Apple and Google. The following results are displayed:
  - The **Sent (Total)** is the total number of notifications sent.
  - The **Opened (Total)** is the total number of notifications that were opened by users.
- The **Opened** tab displays information about the total number of mobile push notifications that were opened by users. The following results are displayed:
  - The **Sent (Total)** is the total number of notifications sent.
  - The **Opened (Total)** is the total number of notifications that were opened by users.
- The **Response Rate** tab indicates the effectiveness of the mobile push notification based on the percentage of users who opened the notification to learn more about its content. The following result is displayed:
  - The **Response Rate (Total)** compares the number of opened notifications with the number of sent notifications.

PART 14

Delivering Web Content

50

Creating Web Content

About Web Content

Take advantage of how people interact with your website by creating tasks that deliver content to one or more spots on your web pages. You can track and collect data about customer behavior on those web pages, and then use that information to gain insights about your web campaign.

These items are used by web tasks to deliver content to the web.

Web Events and Data Views

A web event enables you to define the customer behavior or action that you want to capture. Examples of events include form submissions, web page loads, viewing an item on a web page, and adding an item to a shopping cart.

Events can be used to trigger a task, set a metric, or define a target audience. You add multiple events to a data view, which provides a framework for how you want to use the event data. Data views can also be used for task targeting and metrics.

Note: You should not select the same data view as both a primary and secondary metric in the same task. In addition, avoid selecting the same data view more than once as a secondary metric in the same task. The system does not check for duplicates, and selecting duplicate data views in the same metric might lead to unexpected results.

For more information, see Chapter 27, "Creating Web Events," on page 309 or "About Data Views" on page 459.

Web Spots
: A spot is the place on a web page where the content that a task delivers is displayed. When you create a spot, you can assign content to that spot. You can also create a spot set, which enables you to coordinate the delivery of your content to multiple spots at once. For more information, see "Creating Web Spots" on page 699.

Creatives
: Creatives represent the content that you want to deliver to a web page. For example, you might combine assets and HTML code to create the content that you want to display to your customer. The combination of the assets and HTML is a creative. For more information, see "Working with Web Creatives" on page 688.

Messages
: A message groups creatives together so that the creatives can be delivered by a task. For example, your website might have a spot where it shows creatives that encourage your website visitors to add more than USD 50 to their cart. One creative might offer free shipping with purchases that total USD 50 or more. A second creative might offer a free gift with purchases that total USD 50 or more. In order for a task to deliver these creatives to your website, the creatives must first be in a message and that message must then be associated with the task. For more information, see "Creating Web Messages" on page 698.

You can replace HTML content based on customer behavior or other factors. Write custom JavaScript code so that the content is delivered to the page from your site rather than from SAS Customer Intelligence 360. For more information, see "Inject HTML Content" on page 37.

Working with Web Creatives

A web creative represents the content that is displayed on your web page. The creative can be HTML, a combination of assets and HTML, or a URL template that a recommendation task uses to locate content to recommend to a user. You can access creatives by navigating to **Creatives** or by opening a message that contains the creative. HTML creatives can also contain personalized content that is retrieved from customer data, events, or data views with merge tags.

Import Assets as Creatives

If you import an asset from **Creatives**, the imported asset is saved as a new creative.

Note: **Assets** is a centralized web-based repository that manages and controls digital marketing assets. For more information, see "About Assets" on page 420.

1 From the navigation bar, click **Creatives**.

2 Click ⋮ .

3 Select **Add Creative from Asset**.

4 Click the **Content source** drop-down list and select an option:

- Select **SAS Digital Asset Management** to add assets from the internal repository in SAS Customer Intelligence 360. This option is selected by default.
- Select **Third Party CMS** to add assets from an external content management system (CMS) that is integrated with SAS Customer Intelligence 360.

  For information about integrating content management systems with SAS Customer Intelligence 360, see Chapter 63, “Integrating with Content Management Systems,” on page 829.

5 Navigate to the asset that you want to make a creative from.

The name of a new creative matches the name of the asset that it was created from. The status of the new creative is Designing.

Note: The thumbnail image for the CMS asset might not be displayed in the creative or in the task that uses the creative. The asset is displayed in the location where it is delivered.

6 When your creative is ready to be published with other items, navigate to the **Orchestration** tab and update the status.

- Click **Mark Ready** when you are finished updating the creative but do not want to publish it. This action changes the status to Ready. You can change the status back to Designing if necessary.
- Click **Mark Ready and Publish** or **Publish** to publish the creative. This action changes the status to Active. Active creatives cannot be changed back to a Ready or Designing status.

If the content of a published item is changed and saved, that item becomes out of sync with the published version. To synchronize the content, select **Republish**. Otherwise, the item stays out of sync with the published version and the updates are not delivered.

For more information, see “Republishing Out of Sync Items” on page 138.

Import Treatments as Creatives

You can import treatment offers from external applications to be used as creatives in SAS Customer Intelligence 360.

Note: The treatment offer must be in a file format that is supported by SAS Customer Intelligence 360.

To import a creative:

1 From the navigation bar, click **Creatives**.

2 Click ⋮ and then select **Import Creatives**.

3 Select one or more treatment offers that you want to import.

Note: An imported treatment offer cannot be used as a creative if the offer has already been imported as a message. Delete the existing message and re-import the treatment offer.

4 (Optional) Select **Edit Properties** to modify the message name and description.

5 Click **Import**.

Note: Custom details that are supported by SAS Customer Intelligence 360 are mapped to the properties for the creative. For more information about custom details for treatments, see the documentation for the external application.

For information about viewing the status of the imported creative, see "View Job Information".

Build Creatives

You can create HTML creatives for all web tasks, except Recommendation tasks and Next Best Action tasks. In addition, you can reuse an HTML creative in other tasks, such as a Mobile Spot task.

If you are creating a Recommendation task, then you need to create a Recommendation creative.

HTML Creatives

You can edit the HTML source of an HTML creative, embed content from a URL, or add an asset to the creative. You can also add a merge tag to personalize the creative with customer information, such as a name, or behavioral information, such as a cart total.

Note: A creative's HTML character count cannot exceed 2,048 characters.

1 From the navigation bar, click **Creatives**.

2 Click .

3 Click **HTML** and edit the HTML source or use the available actions to embed content from a URL, add an asset, or insert a merge tag.

Creating an HTML creative automatically opens the HTML editor. However, you might need to update the properties of the creative before you can complete your work in the editor. In that case, click **Done** to save your changes and close the editor. When you are ready to return to the editor, navigate to **Content** ⇨ **Layout** and click **Edit**.

4 To add personalized information, insert a merge tag into the creative. To add a merge tag, click and either select the merge tag or enter a variable. The available merge tags are retrieved from imported customer data and display consistently across tasks. For example, a creative with a merge tag that displays a customer's name always displays a customer name when used in a task, regardless of which task it is used in.

You can choose to insert a variable instead of a merge tag. Variables give you more flexibility by allowing the merge tag to be selected later, after the creative is added to a task. In addition, personalization variables can display either imported customer information or behavioral information. The behavioral information, such as a cart total or the name of a product that a person has added to their cart, is retrieved from an event or data view. Because personalization variables enable you to select the merge tag while designing the task, you can reuse the same creative to display different types of personalized information. For example, in a web task, a creative with a variable can display a cart total and in a mobile task the same creative can display a customer name.

- To learn about merge tags and their prerequisites, see "Adding Personalized Information to Creatives" on page 447.
- For information about using merge tags and variables in creatives, including syntax details, see "Personalizing HTML Creatives" on page 694.

5 When your creative is ready to be published, navigate to the **Orchestration** tab and update the status.

- Select **Mark Ready** to change the status from Designing to Ready. A Ready status indicates that this item is ready to be published. When you are ready to promote an item from a Ready status to an Active status, click **Publish**.

  Note: When you publish an item, you are prompted to publish any dependent items that are marked Ready.

  Items with a Ready status can be changed back to a Designing status by clicking **Return to Designing**. Changing this status to Designing prevents the item from being published.

  Note: If your item has a Ready status and a start date, the item is not automatically published when the start date is reached. For example, if you are creating a task, it must be published in order for the start date to activate the task.

- Select **Mark Ready and Publish** to change the status from Designing to Active. Items with an Active status cannot be changed back to Designing.

If the content of a published item is changed and saved, that item becomes out of sync with the published version. To synchronize the content, select **Republish**. Otherwise, the item stays out of sync with the published version and the updates are not delivered.

For more information, see "Republishing Out of Sync Items" on page 138.

Creatives for Recommendation Tasks

In order to display recommended content to users, a recommendation task requires a recommendation creative. A recommendation creative specifies the URL template that you want a task to use when making product recommendations. The system uses the URL template to access the correct creatives for the recommendation task. By adding a recommendation creative that specifies which URL template to use, you are defining the creative locations that this message should contain.

Note: The **Recommendation** option is displayed only after a URL template has been defined in **General Settings** ⇨ **Analytic Settings** ⇨ **Recommendation Task**.

- For more information about Recommendation Tasks and their prerequisites, see "Creating a Recommendation Web Task" on page 720.
- For more information about setting up a URL template, see "Recommendation Task" on page 104 in **Setting Up** ⇨ **Analytics**.

1 From the navigation bar, click **Creatives**.

2 Click .

3 Click **Recommendation** to specify the information that a web task needs before the task can deliver personalized recommendations.

> **TIP** In order for a message to be available to a web task that is delivering recommendations, the message must contain at least one recommendation creative. When you create a recommendation task, you are asked to select the message that contains the URL template that is used to locate the creatives.

4 When your creative is ready to be published with other items, navigate to the **Orchestration** tab and update the status.

- Select **Mark Ready** to change the status from Designing to Ready. A Ready status indicates that this item is ready to be published. When you are ready to promote an item from a Ready status to an Active status, click **Publish**.

  Note: When you publish an item, you are prompted to publish any dependent items that are marked Ready.

  Items with a Ready status can be changed back to a Designing status by clicking **Return to Designing**. Changing this status to Designing prevents the item from being published.

  Note: If your item has a Ready status and a start date, the item is not automatically published when the start date is reached. For example, if you are creating a task, it must be published in order for the start date to activate the task.

- Select **Mark Ready and Publish** to change the status from Designing to Active. Items with an Active status cannot be changed back to Designing.

If the content of a published item is changed and saved, that item becomes out of sync with the published version. To synchronize the content, select **Republish**. Otherwise, the item stays out of sync with the published version and the updates are not delivered.

For more information, see "Republishing Out of Sync Items" on page 138.

Manage Creatives

From the **Creatives** page, you can delete, copy, open, or rename a creative. Select the creative from the list and choose the appropriate action.

Update Properties

Navigate to the **Properties** tab to see information about the creative. The **Standard** section contains basic information, such as the name, type, description, category, and code.

Note: Not all fields are required.

- The **Category** field is displayed only if the properties available in the system have been assigned a category. However, the selected **Category** determines which merge tags are displayed in the merge tag selection list.
- The **Code** field is needed to map treatments from external applications to the creative. For example, if you are using a dynamic merge tag to retrieve information from an external application, the code must be set in order for the dynamic merge tag to work successfully.

  When a treatment is imported or migrated to SAS Customer Intelligence 360 from an external application such as SAS Marketing Automation, the existing value for the object appears in the **Code** field. Depending on the code settings for your environment, the code value might be editable. This value is not required to be unique to be valid. If the value is editable, you can change it to match the code value for another item. Valid characters for codes are alphanumeric characters, multi-byte characters, numerals, underscores, hyphens, and periods. Blank spaces are not allowed in code formats.

The code is also used as the unique identifier for a creative when the creative is going to be served as part of a staged creative web or mobile HTML task. For more information, see “Select the Task Type” on page 733.

Note: External codes and dynamic tags are intended for use with a staged creative task. If you use a creative with a dynamic tag in a web task that is not a staged creative task, only the default tag value is displayed on the content that the task delivers.

In the **Custom** properties section, add, remove, or select custom properties. For more information, see “Define Custom Properties” on page 143.

View Usage Information

From the **Orchestration** ⇨ **Usage** tab, you can view which items use the creative and the items that the creative uses.

The ability to view dependencies between items enables you to see the items that a task depends on to work successfully. Usage information helps you identify how changes that you make to one item might affect another item.

Items That Use the Creative

The first section shows the items that use the creative. For example, if the creative is used in a task, the task is included in the list.

The Priority column displays the priority of like tasks that use the creative. Priority applies only to mobile spot, web spot, and mobile in-app message tasks because each of those task types might have two or more tasks that compete for the same resources. Other task types do not use prioritization.

For non-A/B test tasks, priority is on a scale of 1 through 5 (where 1 is the highest). The default is 3. An A/B test task has a priority of Test, which is higher than a non-A/B test task. An A/B test task always delivers its content.

You can change the priority of a non-A/B test task on the task’s **Orchestration** ⇨ **Priority** tab.

Items That the Creative Uses

The second section shows items that the creative uses.

- Click **Directly Related** to list the items that the creative uses. For example, if a creative uses an asset, the asset is included in the list.
- Click **All Related** to view directly related items as well as any items that those directly related items use. For a creative, the list of directly related and all related items is the same.

  The list displays items with a Designing, Ready, or Active status. Click **Show Designing Status only** to display only items with a Designing status.

To open an item, click the item. To view item details and to open the item, click ⓘ in the item’s row.

Note: HTML assets that are the content source for mobile spot, web spot, and email creatives are not listed.

End Creatives

Select **End** if you want to stop the creative from publishing. This action changes the status of the creative to Complete and the creative cannot be included in a task. Only a creative that is not currently in use by a task can be completed. Ending an item stops any associated data collection and makes the item's content unavailable. In addition, any unsaved changes to the creative are lost.

Personalizing HTML Creatives

You can add personalized customer information to creatives by adding merge tags. With merge tags, your creative can display information about a customer, such as a name, or behavioral information available from an event or data view. When you add a merge tag, you have the option of selecting a variable to insert in place of the merge tag. Inserting a variable enables the merge tag to be selected in the task, instead of in the creative.

For more information about merge tags and variables, see “Adding Personalized Information to Creatives” on page 447.

Insert a Merge Tag or Variable

A creative can include both a merge tag and a variable. To insert a merge tag or a variable, you need to be in the HTML editor.

Note: The merge tag or variable is inserted at the place where your cursor is located.

1 Click .

2 Add a merge tag:

   a Select the tag from the list.

   Note: If the merge tag is not in the list, you might need to exit the HTML editor and update the information on the **Properties** tab. For example, you might need to set the category of the merge tag, or select the custom merge tag from a list. After you update the **Properties** tab, save the creative and re-open the editor. To return to the editor, navigate to **Content** ⇨ **Layout** and click **Edit**.

   b (Optional) Enter a default value for the merge tag. The default value is used when the customer data cannot be retrieved. For example, if a user is not logged on to your website, SAS Customer Intelligence 360 cannot know their identity. As a result, no customer information is available to replace the merge tag. Instead, the default value is used.

Note: You can manually enter the merge tag into the HTML code if you do not want to select it from the list.

3 Add a variable:

   a Click **Insert Variable** from the **Select in task** section. The HTML code is updated with a default variable.

   Note: When someone adds a creative containing a variable to a task, that person needs to select a merge tag to use for the task.

   b (Optional) The variable must start and end with braces. However, you can change the variable name by editing the content within the braces. For example, you can replace

   `{{variable1}}`

   with

   `{{cart amount}}`

   or

   `{{user name}}`

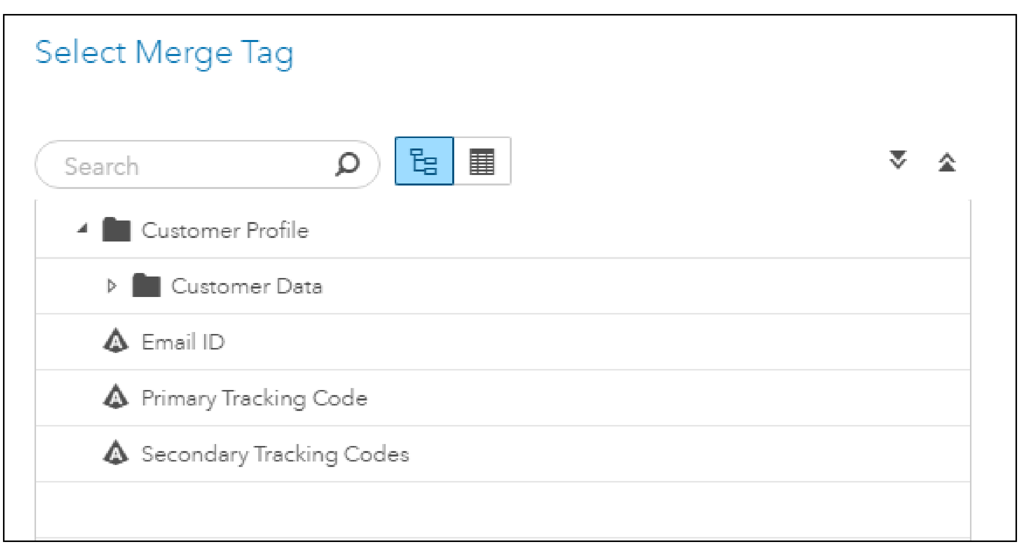
   .

After inserting either a merge tag or a variable, the creative must then be added to a task. The task can then deliver the personalized content.

Select a Merge Tag

In the **Select Merge Tag** window, click to display a hierarchical folder view of merge tags. You can expand and collapse individual folders. Click to expand all of the folders. Click to collapse all of the folders.

Figure 50.1 Select Merge Tag Window



Click to display individual merge tags in alphabetical order.

Enter Merge Tag Syntax Manually

You can manually enter the merge tag syntax:

```
%%<source>.<category>.<name>%%
```

In the merge tag syntax, `source` represents the data source, `category` is the data group, and `name` is the field name of the data item.

If you manually enter a merge tag, you can insert | | after `name` and specify a default value within the syntax:

```
%%<source>.<category>.<name>||<default value>%%
```

By default, automatic number formatting is applied to numbers. A string, such as a postal code, is displayed as `25,678` instead of `25678`. To override automatic number formatting, insert `$` after `%%` :

```
%%$<source>.<category>.<name>%%
```

In this example, automatic number formatting is overridden for a postal code:

```
%%$DATAHUB.customer.zip%%
```

Example: Use Variables and Merge Tags to Target Event Attributes

You can use any event and the event attributes to personalize tasks. For example, you can use a Web task to display a personalized message to customers who add a particular product to their cart.

1 Select **Creatives** on the navigation bar and click .

2 Click **HTML**.

3 In the HTML source, position the cursor where you want to add the variable. Click and select **Insert Variable**. The variable name is inserted in braces.

   The HTML text could be similar to this example:

   ```
   Hi,{{variable1}}! We hope you'll love our Super Sandals!
   ```

   You can also add the product image to the creative.

4 Select **Tasks** on the navigation bar and click

5 Click **Web**.

6 On the **Content** tab, click **Select Content** and select the HTML creative that you added.

7 The variable must be associated with a merge tag. On the **Targeting** tab, select an Add to Cart event. Add an attribute condition that the product name of Super Sandals must be met.

8 On the **Content** tab, click and select “customer first name” from the Customer Data folder.

When the event, creative, and task are published, customers who add the specified product to their cart will view a personalized creative.

Example: Use Variables and Merge Tags to Target Data View Attributes

You can use merge tags and data views to target attributes such as the product names from multiple events. For example, you can use a Web task to display the specific product name, quantity, and SKU when one of a number of products is added to a cart.

1 Select **Events** on the navigation bar and click .

2 Click **Add to Cart**.

3 Click **Click**.

4 Select the click target.

5 On the **Event Details** tab, select **Product Attributes** and supply values for Product Name, Product SKU, and Product Quantity Added to Cart.

6 Create another Add to Cart event for a different product and specify the product attributes.

7 Select **Data Views** on the navigation bar and click .

8 On the **Conditions** tab, add the two Add to Cart events that you have created. The common attributes for both events are listed on the **Attributes** tab of the data view.

9 Select **Creatives** on the navigation bar and click .

10 Click **HTML**.

11 In the HTML source, position the cursor where you want to add the variables. For each variable, click and select **Insert Variable**. The variable name is inserted in braces. You can replace the name in braces with your own text.

The HTML text could be similar to this example:

```
Product: {{product name}
<p>
SKU: {{SKU}}
<p>
Quantity: {{product quantity}}
```

12 Select **Tasks** on the navigation bar and click

13 Click **Web**.

14 On the **Content** tab, click **Select Content** and select the HTML creative that you added.

15 The variables must be associated with merge tags. On the **Targeting** tab, select the data view that you created.

16 On the **Content** tab, click . Click for each variable and specify the Product Name, SKU, and Product Quantity attributes.

When the event, data view, creative, and task are published, the correct product information is displayed when a specific product is added to a cart.

Creating Web Messages

Messages give you a way to organize creatives by grouping them together, regardless of the channel for which the creatives are designed. For example, a message might contain creatives about the same offer, even though the creatives are meant for different channels. A web task uses the creatives in a message to determine what content to display on a website. If you are creating a message for a web task, be sure to add creative types that can be used in web tasks. The following types of creatives are supported for the web channel:

- HTML creatives
- creatives from imported assets
- recommendation creatives that are defined using a URL template

A message and its creatives can be added to a web task only after the message is marked ready or is published. For information about creating messages, see Chapter 35, “Creating Messages,” on page 437.

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Creating Web Spots and Spot Sets

Creating Web Spots

A spot is the place on a web page where a task delivers content. When you create a spot, you can assign content to that spot. Adding default content to a spot ensures that the spot is never empty, even if there are no tasks delivering content to that spot. By default, any element can be defined as a spot on a web page. To limit the elements that are available to select as spots, see "Specify Eligible Spot Elements" on page 36.

When a spot is open, content delivery and event processing are suspended for the site on any tab in the same browser instance. To see content delivered or to process events on the site while you are creating or editing a spot, open the site in a different browser.

Create Web Spots

1 From the navigation bar, click **Spots**.

2 Click .

3 Select **Web Spot**.

4 Navigate to the web page where you want the spot to appear. Click the area on the web page where you want your content to be displayed and click **Select**. The **Selector** field displays the CSS selector on page 989 for that element.

- Click **Select Parent** to refine the selector. This option is available when the area that you selected on the web page is a valid spot. You can also manually edit the CSS selector, which then highlights any page elements that match.

- Existing spots have are overlay that displays their spot name. The new spot cannot contain or be part of an existing spot.
- If you select any page element that is not a <div> tag to be the spot, the system replaces that page element and anything nested inside it when the creative is delivered to the page. If you select a <div> tag to be the spot, the system replaces everything nested inside the <div> tag when the creative is delivered to the page.
- To update the location of your spot, navigate to the **Spot Location** tab of your task.
- When you select a spot, the system automatically assigns predefined dimensions to that spot. You can change the assigned dimensions in the **Spot Details** ⇨ **Spot Configuration** ⇨ **Spot Details** section.

  Note: The dimensions that are assigned to your spot might not match the actual spot size.

5 Specify which pages include the spot by navigating to **Spot Details** ⇨ **Spot Configuration** and updating the **Spot Location** section.

- Select **Any page** to include all pages that contain the spot that you defined.
- Select **Pages matching attribute pattern** to define rules that determine which pages to include. You can create a pattern that matches a URL, a domain, or an element.
- Select **Only page where selector was chosen** to include only the page that was displayed when the spot was selected.

6 Add additional spot attributes by selecting **Spot Details** ⇨ **Spot Attributes**. Spot attribute names can contain only ASCII letters, digits, underscores, or dots, and the names must begin with a letter. In addition, spot attribute names cannot have more than 32 characters. Click ✚ to add an attribute to collect information about the web page that contains your spot.

> **TIP** If you plan on using this spot in task targeting, it must have at least one attribute. Spots without attributes cannot be selected as criteria on a task's **Targeting** tab.

7 Navigate to the **Default Content** tab and activate the switch to add default content to your spot. Click **Select Content** and select the message that contains the creatives that you want to set as the default content. Specifying default creatives ensures that content is displayed in your spot even if the spot is not used in an active task.

8 Navigate to the **Orchestration** tab and select either **Mark Ready** or **Mark Ready and Publish**. This action makes your spot available to a task.

A Ready status indicates that the spot is ready to be published with a task. When someone publishes a task that uses a Ready spot, that person is prompted to confirm that the spot should be published along with the task. Spots with a Ready status can be changed back to a Designing status by clicking **Return to Designing**. Changing the status prevents the spots from being published by a task.

To move a spot from a Ready status to an Active status, click **Publish**. Spots with an Active status cannot be changed back to Designing. A spot with an Active status does not prevent a task from publishing.

If the content of a published item is changed and saved, that item becomes out of sync with the published version. To synchronize the content, select **Republish**. Otherwise, the item stays out of sync with the published version and the updates are not delivered.

For more information, see "Republishing Out of Sync Items" on page 138.

Click **End** from the **Orchestration** tab to change the status from Active to Complete. Completed spots cannot be used in a task and cannot be modified. Ending a spot stops any associated data collection and makes the spot's content unavailable. In addition, any unsaved changes to the spot are lost.

Note: If you complete a spot that is associated with an active task, then that active task is also completed. If you complete a spot that is associated with an active task that is part of an activity, then both the task and the activity are completed. As a result, all data collection ends for these items. In addition, any spot sets that use the spot are also completed. Content cannot be delivered to completed spots. As a result, any unpublished tasks that use the completed spot need to be updated to use a different spot before the tasks can be published.

Monitor the Performance of a Spot

View the Performance of a Single Spot

From the **Insights** tab, you can view information that can help you determine how effective a spot is. For example, you can find information about how much traffic your spot is getting. Then you can use the information to help you determine whether the spot is in a good location for the creative that your task is displaying.

Note: The spot must have an Active status.

The **Summary** section contains details about the volume of people that have seen the spot. Select one of these metrics from the **Variable** drop-down list:

- **Unique Users**: This metric counts only the first viewable impression, showing you how many individuals have seen the spot.
- **Viewable Impressions**: This metric counts every impression by a user, showing you the total number of impressions that have been displayed. As a result, the number of unique users is always less than or equal to the number of viewable impressions.

You can also choose the time period for which to display metrics. You can select the previous 7 days, 14 days, or 30 days.

As you change the options in the spot performance graph, other metrics on the page change to reflect what you selected. You can hover the pointer over a data point in the graph to see information about that data point. Right-clicking a data point gives you the option to create a task that contains the spot.

For example, if you want to see how many people have seen your spot in the last week, open the spot and click the **Insights** tab. For the graph that is displayed in the **Summary** section, set **Data for Most Recent** to **7 days** and set **Variable** to **Unique Users**.

Compare the Performance of Multiple Spots

You can compare the effectiveness of two or more spots in one view.

1 Select two or more spots with an Active status.

2 Click ⋮ and select **Compare Spot Metrics**.

The performance metrics for all of the selected spots are displayed in the same spot performance graphs.

Copying Web Spots

If you have a spot whose details you want to reuse, you can copy it to create a spot. The copy contains the same spot details and default content as the original.

1 From the navigation bar, click **Spots**.

2 Click the check box next to the web spot that you want to copy.

3 Click ⋮ and select **Copy**.

4 Enter a name and selector for the new spot. You can either enter the selector or click to select the spot from a web page. For more information, see "Creating Web Spots" on page 699 .

Note: Only spots that are not currently in use in an active spot can be selected.

Creating a Web Spot Set

Creating a spot set enables you to coordinate the delivery of your content to multiple spots at once. By synchronizing when multiple creatives are updated, you can better control the message to your customer. When you create a spot set, you can create spots or add existing spots to the set.

If the spot set that you are creating is for an A/B test task or a web multivariate test task:

- Avoid spot sets that display a subset of their spots on one web page. The analytics assume that all of the spots in the set are always available simultaneously.

  Note: To guarantee that all of the spots in a set are displayed simultaneously, the values for the spot location details must be identical across all of the spots in the set. Matching the spot location details enables analytics to run successfully on your A/B test task or multivariate test task.

- Avoid spots that are used by another active A/B test task or web multivariate test task.

1 From the navigation bar, click **Spots**.

2 Click .

3 Select the type of spot set to create:

- Select **Web Multi-Page Set** to create a spot set that displays content on multiple spots in different web pages.
- Select **Web Single-Page Set** to create a spot set that displays content on multiple spots in the same web page.

4 Add spots to the spot set.

- Click **Create Spot** to create a spot that is automatically included in the spot set.
- Click **Add Existing Spots** to select which spots to add to the set by navigating to the web page that contains the spots that you want to include.

  Note: At any time while selecting spots to include in your set, you can navigate to different web pages. However, the only spots that you can include in your set are the spots that exist on the web page that is currently displayed.

5 Update spot information.

- Select **Edit Spot** to update the spot configuration, such as the CSS selector on page 989 or location.
- Select **Apply attributes from this spot to the spot set** to assign the attributes from this spot to the spot set. Because only one spot can contribute attributes to the set at a time, selecting this option prevents any other spot in this set from contributing attributes to the set.

  Note: Selecting this option does not change the attributes of any of the spots; it affects only the spot set. However, to use this spot set in task targeting, this option must be selected.

6 On the **Orchestration** tab, take these actions:

- Select **Mark Ready** to change the status from Designing to Ready. A Ready status indicates that this item is ready to be published. When you are ready to promote an item from a Ready status to an Active status, click **Publish**.

  Note: When you publish an item, you are prompted to publish any dependent items that are marked Ready.

  Items with a Ready status can be changed back to a Designing status by clicking **Return to Designing**. Changing this status to Designing prevents the item from being published.

  Note: If your item has a Ready status and a start date, the item is not automatically published when the start date is reached. For example, if you are creating a task, it must be published in order for the start date to activate the task.

- Select **Mark Ready and Publish** to change the status from Designing to Active. Items with an Active status cannot be changed back to Designing.

If the content of a published item is changed and saved, that item becomes out of sync with the published version. To synchronize the content, select **Republish**. Otherwise, the item stays out of sync with the published version and the updates are not delivered.

For more information, see “Republishing Out of Sync Items” on page 138.

When the spot set is created, you can view the properties of each spot in the set by navigating to the **Spot Set** tab. From the **Spot Set** tab, you can also add new spots to the set.

A spot set ends when you click **End** from the **Orchestration** tab. The status of the spot set changes from Active to Complete. Completed sets cannot be used in a task and cannot be modified. Ending a spot set does not automatically end the spots that it contains, because those individual spots might be in use in other tasks.

If you complete a spot that is associated with an active task, then that active task is also completed. If you complete a spot that is associated with an active task that is part of an activity, then both the task and the activity are completed. As a result, all data collection ends for these items. In addition, any spot sets that use the spot are also completed. Because content cannot be delivered to completed spots, any unpublished tasks that use the completed spot need to use a different spot before the task can be published.

View Spot Usage Information

From the **Orchestration** ⇨ **Usage** tab, you can view which items use the spot and the items that the spot uses.

The ability to view dependencies between items enables you to see the items that a task depends on to work successfully. Usage information helps you identify how changes that you make to one item might affect another item.

Items That Use the Spot

The first section shows the items that use the spot. For example, if the spot is used in a task, the task is included in the list.

The Priority column displays the priority of like tasks that use the spot. Priority applies only to mobile spot, web spot, and mobile in-app message tasks because each of those task types might have two or more tasks that compete for the same resources. Other task types do not use prioritization.

For non-A/B test tasks, priority is on a scale of 1 through 5 (where 1 is the highest). The default is 3. An A/B test task has a priority of Test, which is higher than a non-A/B test task. An A/B test task always delivers its content.

You can change the priority of a non-A/B test task on the task’s **Orchestration** ⇨ **Priority** tab.

Items That the Spot Uses

The second section shows items that the spot uses.

- Click **Directly Related** to list the items that the spot uses. For example, if a spot uses a creative, the creative is included in the list.

- Click **All Related** to view directly related items as well as any items that those directly related items use. For example, you might see the creative that the spot uses and an asset that is used by that creative.

  The list displays items with a Designing, Ready, or Active status. Click **Show Designing Status only** to display only items with a Designing status.

To open an item, click the item. To view item details and to open the item, click *i* in the item's row.

Note: HTML assets that are the content source for mobile spot, web spot, and email creatives are not listed.

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Working with Web Tasks

About Web Tasks

A web task delivers targeted content to website visitors and collects information that you can use to monitor how the task is performing. For example, you can set up a web task to display a specific creative to adults between the ages of 25 and 45 when they visit your website's home page.

There are several types of web tasks, and they can be categorized as standard web tasks or test web tasks. Standard tasks are useful when you know what content you want to deliver to your target audience. Test tasks can be used to compare the effectiveness of multiple creatives against your target audience. For information about web test tasks, see “Deciding Which Type of Test to Run” on page 930.

Standard web tasks can deliver content to a target audience in different ways.

- Specify which creatives you want the task to display. If multiple creatives are associated with a task, you can also specify how the creatives are displayed. For example, you can set the order in which the creatives are displayed or set rules so that a creative is displayed to a subset of the task's target audience.
- Use recommendations to personalize which creatives a task displays. Recommendations tasks capture visitor behavior that indicates interest in a particular product and then display content based on the visitor's interest.
- Configure the web task to deliver the staged creative offers received from an external application, such as SAS Real-Time Decision Manager.

You can open a task or create a new task from the **Tasks** page. To access the items that a task uses and see information about the task, navigate through the different tabs.

- The **Content** tab contains items that relate to the content that your task delivers. These items include any creatives that are delivered to a spot or set of spots on your web pages. The **Content** tab includes other tabs where you can update the spot, update the content, set content distribution, set impression limits, and specify personalization variable values.
- The **Targeting** tab contains the details about your target audience, including a count of members and a summary of all criteria that make up the target audience. You can specify who to include or exclude from your target audience by adding criteria and existing segments.
- The **Insights** tab includes information about how the task is performing and where you set metrics for your task.
- The **Orchestration** tab contains the schedule and priority of the task. The tab also contains details about any item associated with the task. There is a list of items that the task uses, such as creatives, segments, or spots. There is also a list of items that use the task. For example, if an activity includes this task, that activity is displayed in the list. From this tab, you can see what items your task depends on to work successfully.

When you create a task, it has a Designing status, which indicates that the task is still being worked on and is not ready to be published. When you finish working on your task, you can either mark it ready to be published, or you can publish it. Before you can successfully publish a task, any items included in that task must have a Ready status or an Active status. A task cannot be published if it contains items that have a Designing status or a Completed status. The items that your task depends on might include data views, spots, segments, or creatives.

Tasks can be published on their own or included as part of an activity. An activity enables you to create and orchestrate your interactions with customers in real time by using tasks and conditions. When the task that you are creating is part of a larger plan for customer interaction, include that task in an activity. Tasks that are created from the **Tasks** interface can be added to an activity map after they have been created. However, a task cannot be added to an activity map after the task has been published. You can also create a task from within an activity map. For more information, see "About Activities" on page 745.

Creating a Standard Web Task

Add Content to Your Task

All of the details and items associated with the content that your task delivers to the web are specified on the **Content** tab. Use the icons available on the **Content** tab to change the spot, message, and creatives that the task uses. You can also set the distribution and impression limits for the creatives or add targeting criteria to each creative associated with the task.

Create a Task

1 From the navigation bar, click **Tasks**.

2 Click .

Select the Spot

You can add either a spot or spot set to the task. When you are designing your task, you can see information about the spot by clicking to open the **Spot** tab. On the spot tab, click to change the spot where your content is displayed. You can select an existing spot, or you can click **New Spot** to create one. The spot that you create is automatically added to the task.

TIP If you select a spot that contains at least one attribute, you can then target the spot attributes on the **Targeting** tab.

Add Message or Creatives

1 Click to open the **Content Selection** tab.

2 Click **Select Content** to add a message or to add creatives to the task. You can choose either to add an existing message or creative, or you can click **New Message** or **New Creative** to create a message or creative. The message or

creative that you create is automatically added to the task. In the **Select creatives** section, select which creatives the task displays.

Note: If you add a creative that contains a personalization variable, a message prompting you to specify the event or data view attribute is displayed above the creative. You can specify the attribute at any time on the **Personalization** tab of the **Content** tab.

3 Click **Preview in Site** to see how creatives look on your site before updating it. You can select the different creatives associated with a spot by clicking [i].

Note: The creatives that appear are ordered by name.

Personalize Creatives

To deliver personalized content to a web page, your task must include a creative that uses merge tags or personalization variables. If the creative contains a personalization variable, you must select which event or data view attribute the task uses to resolve the variable.

1 Navigate to the **Personalization** tab.

2 Select the creative.

3 Click to add a value to the personalization variable.

4 Select the event or data view attribute that corresponds to the information that you want the creative to display when the task delivers content.

   Note: In order for the personalized content to be displayed successfully, the event or data view attribute that you select must also be included in the targeting criteria for this task.

5 (Optional) Enter a default value. The default value is used when the customer data cannot be retrieved. For example, if a user is not logged on to your website, the system cannot know the user's identity. As a result, no customer information is available to replace the merge tag. Instead, the default value is used.

Set Distribution of Content

If this task contains more than one creative, you can refine how each creative is displayed. Click to open the **Distribution** tab and select the method that you want the task to use when determining how to display content.

Frequency Distribution

Select **Frequency** to specify how often a creative is displayed compared with the other creatives in this task. Next, set a percentage for each creative.

Note: Frequency is the default distribution method. By default, each creative is assigned equal distribution.

Sequential Distribution

Select **Sequential** to set the order in which the creatives are displayed.

CAUTION! The order is reset every 24 hours. After 24 hours the order is reset, and the first creative in the sequence is selected again. If the content delivery schedule for your task is longer than 24 hours, the creatives might not be displayed in the order that you have specified.

Rule-based Distribution

Select **Rule-based** to split a task's target audience into subgroups and associate a creative with each subgroup, thereby personalizing the content that your target audience sees. You can assign different criteria to each creative so that you can decide which creatives are delivered to different subgroups of the target audience.

Note: When you select the rule-based option, the criteria that you add to each creative are applied after the criteria on the **Targeting** tab are applied. Think of rule-based criteria as a way of refining which members of the task's target audience see specific creatives.

Each creative is assigned a number that indicates the order in which the creative's targeting criteria are evaluated. The creative that has the number 1 associated with it is evaluated first. The first creative with criteria that match a user is the creative that is delivered to that user. As a result, any creatives that come after the matching creative are not evaluated.

You can change the numbers that are associated with a creative by changing the position of the creative in the list. To change the creative order:

1. Click from the **Distribution** tab.
2. Select the creative that you want to move.
3. Click the arrows to move the creative up or down in the list.

A best practice is to ensure that there is always a creative that is displayed in your spot. For web and mobile spot tasks, there are two ways to ensure that a spot that this task delivers content to is never empty.

- Your task includes a spot that contains a default creative.
- The creative in the rule-based creatives list that comes last (that is, the creative associated with the highest number) does not contain additional targeting. A creative that is listed last and does not have additional criteria associated with it is displayed when none of the previous criteria match the task's audience member.

The creative that does not contain additional criteria becomes the default creative for this task. The default creative is denoted by . As a result, any creatives listed after the default creative are never delivered.

Note: When you create a mobile in-app message or mobile push notification, you must denote one creative as the default creative.

To add targeting criteria to each creative, select the creative and follow these steps:

- Select **All of the following** to include members who meet all of the criteria in a group. Or, select **Any of the following** to include members who meet one or more of the criteria in a group.
- Click to view a summary of the criteria.
- Click to make a copy of the criteria.
- Click or to move criteria up or down in the list.

- Click [icon] to create a group for a set of criteria.
- Click + to add criteria. In the **Select Criteria** window, select the criteria to add. In addition, you can use customer lists that have been imported from other sources, such as SAS Marketing Automation.

  Note: For mobile in-app, mobile spot, and web targeting, when you add **Browser and Device** to your criteria, only the people who are using that browser or device during the current session are included in the target audience. For example, if you add Chrome as the browser, only the people who are using Chrome during the current session are eligible to be included in the target audience.

  When you add a spot attribute that contains a URL query string parameter, the value of that parameter needs to be decoded for multi-byte character sets (MBCS). If you are adding a URL query string, the value should be encoded for MBCS.

Set Impression Limits

Click [icon] to limit the number of times a customer sees your content.

- Select **Limit total impressions per user** to specify the total number of times a creative is displayed to a customer. This limit is valid for the duration of this task.
- Select **Limit impressions per user by period**.

  Select **Time period** to specify the maximum number of impressions that a user sees during a specified time interval (for example, minutes, hours, days, or months).

  Select **Session** to limit the number of impressions that a user sees while interacting with content, such as your website or mobile app. By default, the session is set to expire after 30 minutes of inactivity, but you can contact a SAS representative to modify this value.

Add a Target Audience

On the **Targeting** tab, set the criteria that define the target audience for the content that the task delivers.

On the **Eligible** page, you can specify which people to include in your target audience. On the **Exclusions** page, you can specify which people to exclude from your target audience.

Note the following rules about defining the target audience:

- If no criteria are added, the target audience includes everyone.
- When you create a target audience using demographic criteria such as city, age, gender, membership status, and so on, only the users who satisfy criteria based on their current data are included in the target audience.
- Previously defined segments, events, and data views can be selected as criteria.

  Note: You must define a login event type if you have tasks that depend on segments with data from logged-in users.

> **TIP** The attributes of the events or data views added to the targeting criteria can be selected as values for personalization variables by navigating to **Content** ⇨ **Personalization**. For more information about delivering personalized content, see "Personalizing HTML Creatives" on page 694.

- You can use customer lists that have been imported from other sources, such as SAS Marketing Automation.
- When you add **Browser and Device** to your criteria, only the people who are using that browser or device during the current session are included in the target audience. For example, if you add Chrome as the browser, only the people who are using Chrome during the current session are eligible to be included in the target audience.
- When you add a spot attribute that contains a URL query string parameter, the value of that parameter needs to be decoded for multi-byte character sets (MBCS). If you are adding a URL query string, the value should be encoded for MBCS.

To add criteria:

1. Click **Eligible** or **Exclusions**.
2. Click ✚ to add a criteria row.
3. In the **Specify criteria** box, click .
4. In the **Select Criteria** window, select the criteria to add.

   To locate criteria, use these options:

   - Click to display a hierarchical folder view of criteria. Click to display individual merge tags in alphabetical order.
   - Click to expand all of the folders. Click to collapse all of the folders.
   - Click to view details, if available, about the criteria.
   - Search for criteria by entering the name in the **Search** field. Select criteria and click to display details.
5. Click **OK**.
6. If applicable, in the **Specify values** box, click and specify a value for the criteria.

   For example, if channel is your selected criterion, you might specify a value of mobile or web. Whereas, there is no need to specify a value if a segment is selected.
7. Repeat steps 1-6 to add criteria.
8. Use these options to work with the criteria list:

   - Click to view a summary of the criteria.
   - Click to make a copy of the criteria. Copying criteria saves steps when you use the same criteria but supply different values.
   - Click ⬆ or ⬇ to move criteria up or down in the list. The position determines the order in which the criteria are checked.

- Click [icon] to create a group for a set of criteria. Groups enable you to nest criteria.
- Click [icon] to delete criteria.

9 Select **All of the following** to include members who meet all of the criteria in a group. Or, select **Any of the following** to include members who meet one or more of the criteria in a group.

10 Click [icon].

Set Metrics

Metrics measure events that the system can detect. For example, the system can detect certain events such as a person clicking a spot on a web page. Add metrics to measure the success of the content being delivered by the task.

Set a Primary Metric

The primary metric measures conversions to determine the success of the task. There can be only one primary metric. You can either edit an existing primary metric or add a new one and then remove the previous metric.

1 Click +.

2 Select the criteria that you want to add. You can select an event view or a data view.

   For more information about events, see "User-Defined Events" on page 304. For more information about data views, see "About Data Views" on page 459.

3 If attributes are defined for the event or data view, select the attribute conditions that must be met. For example, for a Click Through metric, you can select a particular creative as an attribute condition. The primary metric would be a click-through response to that creative.

   Note: Attributes are joined by an AND operator. Make sure that you do not define conflicting attributes that result in a condition that cannot be met.

4 To mark this selection as a contact or response that can be tracked and used for reporting and future targeting, select **Classify this selection**. Classifying an event or data view enables you to compare contacts and responses across creatives and channels. You can personalize future messages and creatives. You can also use the information to segment customers. You can classify events and data views in both primary and secondary metrics.

   To record the number of times that a customer interacts with a creative or a spot, select **Mark this selection as a contact**. This information is available as contact history for SAS Marketing Automation, SAS Real-Time Decision Manager, and other applications.

   To mark this selection as a response to a creative, select **Mark this selection as a response**.

5 Select **Stop delivery after conversion** to stop delivering creatives when the primary metric for the task is met.

When delivery of the creatives stops, that same spot might switch to displaying creatives from another task. If there is no other task delivering a creative to that spot, then the spot's default creative is displayed. If there are no other tasks delivering content to that spot and there is no default content defined for that spot, then the spot is empty.

Set Secondary Metrics

A secondary metric measures other benchmarks that you are interested in. A task can have multiple secondary metrics. Each secondary metric can have only one data view or event.

Click **Add Secondary Metric** to add a secondary metric.

Modify Existing Metrics

You can change the settings for an existing metric.

Note: The action icons for a metric are only visible when the metric has focus. For example, a metric has focus when you tab to it or when you move your mouse over the metric.

- Click to update the metric details.
- Click to remove a metric.

Set the Priority of Your Task

Multiple tasks might compete for the same resources. When this happens, the system needs to know which task to deliver to the user. For this reason, tasks must be assigned a priority. For example, you might have the following situations:

- you might create two mobile in-app message tasks that deliver content using the same trigger event.
- you might create two mobile spot tasks that use the same spot.
- you might create two web tasks that use the same spot.

Here are the rules for how relative priority is determined:

- Priority is set relative to other tasks of the same type.
- Priority is set based on a scale of 1 to 5, where 1 is the highest priority and 5 is the lowest priority. The default priority is 3. You can change the priority.

  Note: A/B test tasks have a priority of Test, which is a higher priority than tasks that are not A/B tests. You cannot change the priority of an A/B test task.
- If the priority of two or more tasks of the same type is the same and a user qualifies for both, the system randomly chooses the task to deliver.

To set the priority of a task:

1. Navigate to the **Orchestration** ⇨ **Priority** tab.
2. Select the number that represents the task’s priority over all other tasks that compete for the same resource.

Note: If an A/B test task exists that competes for the same resource, the A/B test task delivers its content regardless of the priority that you set here.

View Usage Information

From the **Orchestration** ⇨ **Usage** tab, you can view which items use the task and the items that the task uses.

The ability to view dependencies between items enables you to see the items that a task depends on to work successfully. Usage information helps you identify how changes that you make to one item might affect another item.

Items That Use the Task

The first section shows the items that use the task. For example, if the task is used in an activity, the activity is included in the list.

The Channel, Priority, and Type columns do not apply to activities and are therefore empty.

Items That the Task Uses

The second section shows items that the task uses.

- Click **Directly Related** to list the items that the task uses. For example, if a task uses a creative, the creative is included in the list.
- Click **All Related** to view directly related items as well as any items that those directly related items use. For example, you might see the creative that the task uses and the asset that is used by the creative.

  The list displays items with a Designing, Ready, or Active status. Click **Show Designing Status only** to display only items with a Designing status.

To open an item, click the item. To view item details and to open the item, click 🛈 in the item's row.

Note: HTML assets that are the content source for mobile spot, web spot, and email creatives are not listed.

Schedule and Start Your Task

When you finish updating your task, you can mark the task ready, publish the task immediately, or set a schedule for the task.

Note: When you schedule a bulk email task, a bulk mobile push notification task, or a direct marketing task, allow a minimum of five minutes between the time you publish the task and the scheduled start time for the task to be active. This time delay is needed by the system to process the request.

On the **Orchestration** tab, take these actions:

- Click **No schedule** if you plan to publish the task manually.
- Click **Set a schedule** to set a time period that the task is active.

  - Select a time zone. For example, you might want to select a time zone that is different from the default if the task is targeted to a specific locale. By default, the time zone is the same as the time zone that is set for the tenant. If a valid time zone is not set for the tenant, the default time zone is UCT.
  - Click **Single occurrence** to specify a single time span that the task is active.
  - Select a start date and an end date for the task.

    Note: If you select **Single occurrence**, the start date cannot be edited after the task is published.
  - Click **Recurrence** to specify a recurring task. Click .

    Specify these details for a recurring schedule:

    - **Start time** is the start time for the first occurrence.
    - **Duration** specifies the amount of time that the content is available for each occurrence. For example, a task might start every week on Monday, and continue for four days.
    - **Frequency** specifies that the schedule for the recurrence. If you click **Weekly**, click the day for each occurrence. You can select multiple days in each week. If you click **Monthly**, select the numbered day or the weekday for the recurrence. For example, you can select the 10th day of each month or the second Tuesday of each month.

      Note: You can edit the weekly or monthly frequency after the task is published and the start date has passed. The recurrence must occur within the start and end dates.
    - **Range of recurrence** specifies the start and end dates, or that the recurrence continues without an end date.
  - **Extend metrics analysis** continues collecting data after the last occurrence. Select the number of days to extend data collection. The default value is 7 days. For example, if you use the default value, and the **Start time** is 9:00 PM, data collection continues until 9:00 PM seven days after the **End by** date.

    Customers might respond several days after the last occurrence. You can extend the time for data collection in order to more effectively measure task performance.

    During the extended period of data collection, the status is Active - Metrics Only. The status changes to Complete when the **Extend metrics analysis** period is over.

- Select **Mark Ready** to change the status from Designing to Ready. A Ready status indicates that this item is ready to be published. When you are ready to promote an item from a Ready status to an Active status, click **Publish**.

  Note: When you publish an item, you are prompted to publish any dependent items that are marked Ready.

  Items with a Ready status can be changed back to a Designing status by clicking **Return to Designing**. Changing this status to Designing prevents the item from being published.

  Note: If your item has a Ready status and a start date, the item is not automatically published when the start date is reached. For example, if you are creating a task, it must be published in order for the start date to activate the task.

- Select **Mark Ready and Publish** to change the status from Designing to Active. Items with an Active status cannot be changed back to Designing.

Changes to a scheduled or active task are not automatically propagated to the published version of the task. You must republish the task after you save it to resolve the Out of Sync status. Otherwise, the task stays out of sync with the published version and the updates are not delivered.

When the end date of a task is reached, its status changes to Complete. Completed tasks cannot be modified. The task stops any associated data collection and makes the task's content unavailable. In addition, any unsaved changes are lost.

Note: A recurring schedule is not available if the task is included in an activity.

Pause the Task

You can pause an active task to temporarily stop delivery of a task. For example, if you want to correct the percentage of a discount that is offered, you can pause the task, edit the amount, and republish. You do not need to end a task in order to update the content. You can make the same changes to a paused task that you can make to an active task.

When a task is paused, you can resume the task to restart content delivery or end the task.

To pause an active task, select **Pause** on the **Orchestration** tab.

During the time that a task is paused, content is no longer delivered. Customers are not selected by the task. Data such as conversions continues to be collected based on impressions that were viewed prior to the pause. When the task resumes, new data is added to the data that was collected before the pause.

Content delivery that does not rely on a trigger and is in progress, such as bulk mobile push notifications, might continue for items that are already in the queue.

If the task is paused and the content has not changed, select **Resume** to make the task active again.

If task content is changed and saved, the task becomes out of sync. Select **Republish** to make the task active again and to deliver the updated content.

End the Task

When your task is running, it collects data and gathers information about progress toward your metrics. Navigate to the **Insights** tab to check the progress of your task.

Click **End** on the **Orchestration** tab when you no longer need the task to deliver content or when the scheduled end date is reached. The status changes from Active to Complete. Completed tasks do not deliver content to a spot, and cannot be modified. Any unsaved changes to the task are lost.

Add Properties to Your Task

There are two types of properties that are associated with a task:

Properties that Identify the Task

Examples of properties that identify the task include **Description** and **Code**. To update task properties, click the **Properties** tab and modify the values in the fields as desired.

An item can be identified by its code for activities such as auditing and reporting. When an item is imported or migrated to SAS Customer Intelligence 360, the existing code value for the item is retained. Depending on the code settings for your environment, the code value might be editable. This value is not required to be unique to be valid. If the value is editable, you can change it to match the code value for another item. Valid characters for codes are alphanumeric characters, multi-byte characters, numerals, underscores, hyphens, and periods. Blank spaces are not allowed in code formats.

The **Code** field enables marketers to use a segment map to target customers based on their internal attributes (account type, balance, and so on) and their previous interactions. These codes are used to communicate information about the targeted customers to vendors or downstream systems. Using codes can minimize errors in text and punctuation that might occur when using an item name that is typically lengthy.

The information in the **Code** field can be used for operational reporting. The information can also be used to select or suppress customers for targeting messages (for example, a marketing message might target or exclude all customers who responded to direct marketing task *12345*).

Properties Used for Plans

To add planning information to a task, open the task and click . For more information, see “Creating a Planning Item” on page 259.

To return to the task view after opening the planning view, complete one of these actions:

- Fill out the required planning properties and save the task.
- Navigate to the **Tasks** view and click the task from the list.

Creating a Recommendation Web Task

About Recommendations

There are two methods for delivering recommendations to users. User-centric recommendations take a user's behavior into account. Product-centric recommendations are based solely on a product.

When you select the user-centric method, it can be helpful to remember the following information:

- This method finds similarities in behavior or characteristics between users and uses that information to make recommendations.
- New users do not receive recommendations during the first day that they visit a website because there is not enough information about that user available to generate recommendations. However, information about the user is tracked right away and is used to create recommendations for future visits.
- It takes one day for a product view to be eligible to be used as a basis for a recommendation. For example, if a user views a product on Wednesday, the recommendations shown to the user do not take that product view into account until Thursday.

When you select the product-centric method, it can be helpful to remember the following information:

- Product recommendations are made based on associations between products, without taking into account user behavior or characteristics. This is helpful when you do not know anything about the user except that they are interested in a product during the current website visit. For example, when a user is looking at a bicycle on your site, you can recommend other products associated with the bicycle, such as bicycle helmets or bicycle baskets.
- Analytics uses product views as a proxy for the ratings that are traditionally used in recommendation systems. The more that products are viewed by similar users, the stronger the association becomes between the products.

Prerequisites for Recommendation Tasks

Prerequisites for User-Centric Recommendations

Before you can create a recommendation task based on user behavior, these items must exist:

- a product view event that contains the attributes that you want to base recommendations on. The product view event that you use for user-centric recommendations must have either a Product ID or Product SKU attribute. It is recommended that the product view also contain a Product Group attribute to ensure that all visitors receive recommendations. For more information, see "Creating Product View Events" on page 323.

Note: Publish the product view event before publishing the task to ensure that the system has enough time to collect the data needed to generate recommendations.

- a URL template for the product view event attribute that you want to base recommendations on. For more information, see "Creating Web Messages" on page 698.

  Note: The URL template must exist when the task is being created. However, when a URL template is selected for the task, the task makes its own copy of the URL template. If any subsequent changes are made to the URL template in use, the recommender creative needs to be republished.

- a message that contains a recommendation creative. The recommendation creative must contain the URL template for the creatives that you want the system to use when making recommendations. For more information, see "Recommendation Task" on page 104.

Prerequisites for Product-Centric Recommendations

Before you can create a recommendation task based solely on a product, these items must exist:

- a spot with at least one attribute named either *product_sku* or *product_id*.
- a product view event that contains the attributes that you want to base recommendations on. The product view event that you use for product-centric recommendations must have a Product Group attribute and either a Product ID or Product SKU attribute. For more information, see "Creating Product View Events" on page 323.

  Note: Publish the product view event before publishing the task to ensure that the system has enough time to collect the data needed to generate recommendations.

- a URL template for the product view event attribute that you want to base recommendations on. For more information, see "Creating Web Messages" on page 698.

  Note: The URL template must exist when the task is being created. However, when a URL template is selected for the task, the task makes its own copy of the URL template. If any subsequent changes are made to the URL template in use, the recommender creative needs to be republished.

- a message that contains a recommendation creative. The recommendation creative must contain the URL template for the creatives that you want the system to use when making recommendations. For more information, see "Recommendation Task" on page 104.

Begin Creating the Task

To create a recommendation task, you need to select the correct web task type.

1 From the navigation bar, click **Tasks**.

2 Click .

3 Click **Web**.

4 Select the spot or spot set where you want the content to be delivered. Click **Refine Task Type**.

Note: Clicking **Create Task** before setting the recommendations options in **Refine Task Type** creates a standard task. After clicking **Create Task**, you cannot return to this screen to select the option to create a recommendation task.

5 Select **Create a recommendation task that delivers personalized content**.

6 Select which method to use when delivering recommendations.

- Select **Product-centric** to base recommendations solely off of the product being viewed.
- Select **User-centric** to base recommendations that take a user's behavior into account.

7 Specify the product view event information to use.

For product-centric recommendations:

a Click ▾ to select a product identifier. The values in this list display attributes that are defined in the spot selected for this task. As a result, the spot that you selected must have either a product_sku or product_id. If this list is empty, select another spot or add attributes to the spot selected for this task.

b Click **Select Events** to choose which product view events you want to use in this task. You can select multiple events.

For user-centric recommendations:

a Click to select a product view event. This event contains the attribute that you want this task to use when making recommendations.

> **TIP** A product view event contains attributes that are used to identify a product.

b Click ▾ to select the attribute that you want to use as the product identifier. The product identifier is the attribute that identifies the product and is typically part of the template URL. The attribute that you select must have a matching URL template.

Note: This list displays the attributes that are already defined in the product view event. For more information, see "Creating Product View Events" on page 323.

8 Click **Create Task**.

After creating a recommendation task, add the message to the task that contains the recommendation creative. The recommendation creative matches the product identifier associated with this task.

Add Content to Your Task

All the details and items associated with the content that this task recommends are specified on the **Content** tab. On the **Content** tab, use the icons to change the spot, message, and creatives that the task uses. You can also set the distribution and impression limits for the creatives.

Select the Spot

You can add either a spot or spot set to the task. While you are designing your task, you can see information about the spot by clicking to open the **Spot** page. On the spot page, click to change the spot where the recommended content is displayed.

TIP If you select a spot that contains at least one attribute, you can then target on the spot attributes in **Targeting**.

Add Message or Creatives

1 Click to open the **Content Selection** tab.

2 Click **Select Content** to add the content that the task uses when delivering recommendations. In the **Select creatives** section, select which creatives the task displays when making recommendations.

   Note: Instead of selecting an existing message or creative to add to the task, you can choose to create a message or creative. To create a message or creative, click **New Message** or **New Creative**. The message or creative that you create is automatically added to the task.

3 Click **Preview in Site** to see how the creatives look on your site before updating it. To select the different creatives associated with a spot, click.

Note: The creatives that appear are ordered by name.

Set Recommendation Options

Click to open the **Recommendation Options** tab and perform these actions:

- change the product view event or product identifier that this task uses

  Note: Changing this option resets the message and creatives associated with the task.

- view the number of recommendations that are displayed

  Note: This option is set in the **General Settings** section. Click **Analytic Settings** ⇨ **Recommendation Task** to update this option.

After the task is published, the options in this tab cannot be modified.

Set Distribution of Content

If this task contains more than one creative, you can refine how each creative is displayed. Click to open the **Distribution** tab and select the method that you want the task to use when determining how to display content.

Frequency Distribution

Select **Frequency** to specify how often a creative is displayed compared with the other creatives in this task. Next, set a percentage for each creative.

Note: Frequency is the default distribution method. By default, each creative is assigned equal distribution.

Sequential Distribution

Select **Sequential** to set the order in which the creatives are displayed.

CAUTION! The order is reset every 24 hours. After 24 hours the order is reset, and the first creative in the sequence is selected again. If the content delivery schedule for your task is longer than 24 hours, the creatives might not be displayed in the order that you have specified.

Rule-based Distribution

Select **Rule-based** to split a task’s target audience into subgroups and associate a creative with each subgroup, thereby personalizing the content that your target audience sees. You can assign different criteria to each creative so that you can decide which creatives are delivered to different subgroups of the target audience.

Note: When you select the rule-based option, the criteria that you add to each creative are applied after the criteria on the **Targeting** tab are applied. Think of rule-based criteria as a way of refining which members of the task’s target audience see specific creatives.

Each creative is assigned a number that indicates the order in which the creative's targeting criteria are evaluated. The creative that has the number 1 associated with it is evaluated first. The first creative with criteria that match a user is the creative that is delivered to that user. As a result, any creatives that come after the matching creative are not evaluated.

You can change the numbers that are associated with a creative by changing the position of the creative in the list. To change the creative order:

1 Click from the **Distribution** tab.

2 Select the creative that you want to move.

3 Click the arrows to move the creative up or down in the list.

A best practice is to ensure that there is always a creative that is displayed in your spot. For web and mobile spot tasks, there are two ways to ensure that a spot that this task delivers content to is never empty.

- Your task includes a spot that contains a default creative.
- The creative in the rule-based creatives list that comes last (that is, the creative associated with the highest number) does not contain additional targeting. A

creative that is listed last and does not have additional criteria associated with it is displayed when none of the previous criteria match the task's audience member.

The creative that does not contain additional criteria becomes the default creative for this task. The default creative is denoted by . As a result, any creatives listed after the default creative are never delivered.

Note: When you create a mobile in-app message or mobile push notification, you must denote one creative as the default creative.

To add targeting criteria to each creative, select the creative and follow these steps:

- Select **All of the following** to include members who meet all of the criteria in a group. Or, select **Any of the following** to include members who meet one or more of the criteria in a group.
- Click to view a summary of the criteria.
- Click to make a copy of the criteria.
- Click or to move criteria up or down in the list.
- Click to create a group for a set of criteria.
- Click to add criteria. In the **Select Criteria** window, select the criteria to add. In addition, you can use customer lists that have been imported from other sources, such as SAS Marketing Automation.

  Note: For mobile in-app, mobile spot, and web targeting, when you add **Browser and Device** to your criteria, only the people who are using that browser or device during the current session are included in the target audience. For example, if you add Chrome as the browser, only the people who are using Chrome during the current session are eligible to be included in the target audience.

  When you add a spot attribute that contains a URL query string parameter, the value of that parameter needs to be decoded for multi-byte character sets (MBCS). If you are adding a URL query string, the value should be encoded for MBCS.

Set Impression Limits

Click to limit the number of times a customer sees your content.

- Select **Limit total impressions per user** to specify the total number of times a creative is displayed to a customer. This limit is valid for the duration of this task.
- Select **Limit impressions per user by period**.

  Select **Time period** to specify the maximum number of impressions that a user sees during a specified time interval (for example, minutes, hours, days, or months).

  Select **Session** to limit the number of impressions that a user sees while interacting with content, such as your website or mobile app. By default, the session is set to expire after 30 minutes of inactivity, but you can contact a SAS representative to modify this value.

Add a Target Audience

On the **Targeting** tab, set the criteria that define the target audience for the content that the task delivers.

On the **Eligible** page, you can specify which people to include in your target audience. On the **Exclusions** page, you can specify which people to exclude from your target audience.

Note the following rules about defining the target audience:

- If no criteria are added, the target audience includes everyone.
- When you create a target audience using demographic criteria such as city, age, gender, membership status, and so on, only the users who satisfy criteria based on their current data are included in the target audience.
- Previously defined segments, events, and data views can be selected as criteria.

  Note: You must define a login event type if you have tasks that depend on segments with data from logged-in users.

  > **TIP** The attributes of the events or data views added to the targeting criteria can be selected as values for personalization variables by navigating to **Content** ⇨ **Personalization**. For more information about delivering personalized content, see "Personalizing HTML Creatives" on page 694.

- You can use customer lists that have been imported from other sources, such as SAS Marketing Automation.
- When you add **Browser and Device** to your criteria, only the people who are using that browser or device during the current session are included in the target audience. For example, if you add Chrome as the browser, only the people who are using Chrome during the current session are eligible to be included in the target audience.
- When you add a spot attribute that contains a URL query string parameter, the value of that parameter needs to be decoded for multi-byte character sets (MBCS). If you are adding a URL query string, the value should be encoded for MBCS.

To add criteria:

1. Click **Eligible** or **Exclusions**.
2. Click ➕ to add a criteria row.
3. In the **Specify criteria** box, click 📂.
4. In the **Select Criteria** window, select the criteria to add.

   To locate criteria, use these options:

   - Click 🗂 to display a hierarchical folder view of criteria. Click ▦ to display individual merge tags in alphabetical order.
   - Click ⏬ to expand all of the folders. Click ⏫ to collapse all of the folders.
   - Click ⊟ to view details, if available, about the criteria.

- Search for criteria by entering the name in the **Search** field. Select criteria and click to display details.

5 Click **OK**.

6 If applicable, in the **Specify values** box, click and specify a value for the criteria.

For example, if channel is your selected criterion, you might specify a value of mobile or web. Whereas, there is no need to specify a value if a segment is selected.

7 Repeat steps 1-6 to add criteria.

8 Use these options to work with the criteria list:

- Click to view a summary of the criteria.
- Click to make a copy of the criteria. Copying criteria saves steps when you use the same criteria but supply different values.
- Click or to move criteria up or down in the list. The position determines the order in which the criteria are checked.
- Click to create a group for a set of criteria. Groups enable you to nest criteria.
- Click to delete criteria.

9 Select **All of the following** to include members who meet all of the criteria in a group. Or, select **Any of the following** to include members who meet one or more of the criteria in a group.

10 Click .

Set Metrics

Metrics measure events that the system can detect. For example, the system can detect certain events such as a person clicking a spot on a web page. Add metrics to measure the success of the content being delivered by the task.

Set a Primary Metric

The primary metric measures conversions to determine the success of the task. There can be only one primary metric. You can either edit an existing primary metric or add a new one and then remove the previous metric.

1 Click + .

2 Select the criteria that you want to add. You can select an event view or a data view.

For more information about events, see “User-Defined Events” on page 304. For more information about data views, see “About Data Views” on page 459.

3 If attributes are defined for the event or data view, select the attribute conditions that must be met. For example, for a Click Through metric, you can select a

particular creative as an attribute condition. The primary metric would be a click-through response to that creative.

Note: Attributes are joined by an AND operator. Make sure that you do not define conflicting attributes that result in a condition that cannot be met.

4 To mark this selection as a contact or response that can be tracked and used for reporting and future targeting, select **Classify this selection**. Classifying an event or data view enables you to compare contacts and responses across creatives and channels. You can personalize future messages and creatives. You can also use the information to segment customers. You can classify events and data views in both primary and secondary metrics.

   To record the number of times that a customer interacts with a creative or a spot, select **Mark this selection as a contact**. This information is available as contact history for SAS Marketing Automation, SAS Real-Time Decision Manager, and other applications.

   To mark this selection as a response to a creative, select **Mark this selection as a response**.

5 Select **Stop delivery after conversion** to stop delivering creatives when the primary metric for the task is met.

   When delivery of the creatives stops, that same spot might switch to displaying creatives from another task. If there is no other task delivering a creative to that spot, then the spot's default creative is displayed. If there are no other tasks delivering content to that spot and there is no default content defined for that spot, then the spot is empty.

Set Secondary Metrics

A secondary metric measures other benchmarks that you are interested in. A task can have multiple secondary metrics. Each secondary metric can have only one data view or event.

Click **Add Secondary Metric** to add a secondary metric.

Modify Existing Metrics

You can change the settings for an existing metric.

Note: The action icons for a metric are only visible when the metric has focus. For example, a metric has focus when you tab to it or when you move your mouse over the metric.

- Click to update the metric details.
- Click to remove a metric.

Set the Priority of Your Task

Multiple tasks might compete for the same resources. When this happens, the system needs to know which task to deliver to the user. For this reason, tasks must be assigned a priority. For example, you might have the following situations:

- you might create two mobile in-app message tasks that deliver content using the same trigger event.
- you might create two mobile spot tasks that use the same spot.
- you might create two web tasks that use the same spot.

Here are the rules for how relative priority is determined:

- Priority is set relative to other tasks of the same type.
- Priority is set based on a scale of 1 to 5, where 1 is the highest priority and 5 is the lowest priority. The default priority is 3. You can change the priority.

  Note: A/B test tasks have a priority of Test, which is a higher priority than tasks that are not A/B tests. You cannot change the priority of an A/B test task.
- If the priority of two or more tasks of the same type is the same and a user qualifies for both, the system randomly chooses the task to deliver.

To set the priority of a task:

1. Navigate to the **Orchestration** ⇨ **Priority** tab.
2. Select the number that represents the task's priority over all other tasks that compete for the same resource.

   Note: If an A/B test task exists that competes for the same resource, the A/B test task delivers its content regardless of the priority that you set here.

View Usage Information

From the **Orchestration** ⇨ **Usage** tab, you can view which items use the task and the items that the task uses.

The ability to view dependencies between items enables you to see the items that a task depends on to work successfully. Usage information helps you identify how changes that you make to one item might affect another item.

Items That Use the Task

The first section shows the items that use the task. For example, if the task is used in an activity, the activity is included in the list.

The Channel, Priority, and Type columns do not apply to activities and are therefore empty.

Items That the Task Uses

The second section shows items that the task uses.

- Click **Directly Related** to list the items that the task uses. For example, if a task uses a creative, the creative is included in the list.
- Click **All Related** to view directly related items as well as any items that those directly related items use. For example, you might see the creative that the task uses and the asset that is used by the creative.

  The list displays items with a Designing, Ready, or Active status. Click **Show Designing Status only** to display only items with a Designing status.

To open an item, click the item. To view item details and to open the item, click in the item's row.

Note: HTML assets that are the content source for mobile spot, web spot, and email creatives are not listed.

Schedule and Start Your Task

When you finish updating your task, you can mark the task ready, publish the task immediately, or set a schedule for the task.

Note: When you schedule a bulk email task, a bulk mobile push notification task, or a direct marketing task, allow a minimum of five minutes between the time you publish the task and the scheduled start time for the task to be active. This time delay is needed by the system to process the request.

On the **Orchestration** tab, take these actions:

- Click **No schedule** if you plan to publish the task manually.
- Click **Set a schedule** to set a time period that the task is active.
  - Select a time zone. For example, you might want to select a time zone that is different from the default if the task is targeted to a specific locale. By default, the time zone is the same as the time zone that is set for the tenant. If a valid time zone is not set for the tenant, the default time zone is UCT.
  - Click **Single occurrence** to specify a single time span that the task is active.
  - Select a start date and an end date for the task.

    Note: If you select **Single occurrence**, the start date cannot be edited after the task is published.
  - Click **Recurrence** to specify a recurring task. Click .

    Specify these details for a recurring schedule:
    - **Start time** is the start time for the first occurrence.
    - **Duration** specifies the amount of time that the content is available for each occurrence. For example, a task might start every week on Monday, and continue for four days.
    - **Frequency** specifies that the schedule for the recurrence. If you click **Weekly**, click the day for each occurrence. You can select multiple days in each week. If you click **Monthly**, select the numbered day or the weekday for the recurrence. For example, you can select the 10th day of each month or the second Tuesday of each month.

      Note: You can edit the weekly or monthly frequency after the task is published and the start date has passed. The recurrence must occur within the start and end dates.
    - **Range of recurrence** specifies the start and end dates, or that the recurrence continues without an end date.
  - **Extend metrics analysis** continues collecting data after the last occurrence. Select the number of days to extend data collection. The default value is 7 days. For example, if you use the default value, and the **Start time** is 9:00 PM, data collection continues until 9:00 PM seven days after the **End by** date.

Customers might respond several days after the last occurrence. You can extend the time for data collection in order to more effectively measure task performance.

During the extended period of data collection, the status is Active - Metrics Only. The status changes to Complete when the **Extend metrics analysis** period is over.

- Select **Mark Ready** to change the status from Designing to Ready. A Ready status indicates that this item is ready to be published. When you are ready to promote an item from a Ready status to an Active status, click **Publish**.

  Note: When you publish an item, you are prompted to publish any dependent items that are marked Ready.

  Items with a Ready status can be changed back to a Designing status by clicking **Return to Designing**. Changing this status to Designing prevents the item from being published.

  Note: If your item has a Ready status and a start date, the item is not automatically published when the start date is reached. For example, if you are creating a task, it must be published in order for the start date to activate the task.

- Select **Mark Ready and Publish** to change the status from Designing to Active. Items with an Active status cannot be changed back to Designing.

Changes to a scheduled or active task are not automatically propagated to the published version of the task. You must republish the task after you save it to resolve the Out of Sync status. Otherwise, the task stays out of sync with the published version and the updates are not delivered.

When the end date of a task is reached, its status changes to Complete. Completed tasks cannot be modified. The task stops any associated data collection and makes the task's content unavailable. In addition, any unsaved changes are lost.

Note: A recurring schedule is not available if the task is included in an activity.

Pause the Task

You can pause an active task to temporarily stop delivery of a task. For example, if you want to correct the percentage of a discount that is offered, you can pause the task, edit the amount, and republish. You do not need to end a task in order to update the content. You can make the same changes to a paused task that you can make to an active task.

When a task is paused, you can resume the task to restart content delivery or end the task.

To pause an active task, select **Pause** on the **Orchestration** tab.

During the time that a task is paused, content is no longer delivered. Customers are not selected by the task. Data such as conversions continues to be collected based on impressions that were viewed prior to the pause. When the task resumes, new data is added to the data that was collected before the pause.

Content delivery that does not rely on a trigger and is in progress, such as bulk mobile push notifications, might continue for items that are already in the queue.

If the task is paused and the content has not changed, select **Resume** to make the task active again.

If task content is changed and saved, the task becomes out of sync. Select **Republish** to make the task active again and to deliver the updated content.

End the Task

While your task is running, it collects data and gathers information about progress toward your metrics. Navigate to the **Insights** tab to check the progress of your task.

Click **End** on the **Orchestration** tab when you no longer need the task to run or when the scheduled end date is reached. The status changes from Active to Completed. Completed tasks do not collect new data, do not deliver content to a spot, and cannot be modified. Any unsaved changes to the task are lost.

Creating a Staged Creative Web Task

You can configure a web task to deliver the staged creative offers received from an external application, such as SAS Real-Time Decision Manager, that has been configured to send the offers to SAS Customer Intelligence 360.

Prerequisites

To enable a task to deliver staged creative offers:

1. Configure an access point to map an external application to SAS Customer Intelligence 360. For more information, see "Add a General Access Point" on page 54.

2. Using instructions from `/stage/README_install.txt` in the SDK ZIP file that you downloaded for the access point, configure the server for your external application. For more information, see "Contents of the General Access Point SDK" on page 61.

3. In SAS Customer Intelligence 360, create an event. For more information, see "User-Defined Events" on page 304. From the **Orchestration** ⇨ **External Availability** tab, select the access point. The event name is used in the mapping file for the access point.

   Note: The manner in which the next best offer is presented is determined by the type of event that you create. For example, if you create a page view event, the event is triggered by viewing a web page.

4. Create an offer in your external application.

   For more information, see the documentation for your external application.

5. In SAS Customer Intelligence 360, import the offer from the external application as a creative. For more information, see "Importing Creatives" on page 436.

6 Open the imported creative, click **Edit** on the **Content** tab, and then add an image and image text. For more information, see "Add Content to Your Task" on page 709.

7 On the **Orchestration** tab, select **Mark Ready and Publish**.

Select the Task Type

1 From the navigation bar, click **Tasks**.

2 Click .

3 Click **Web**.

4 Select the spot or spot set where you want the content to be delivered. Click **Refine Task Type**.

Note: Clicking **Create Task** before setting the next best action option in **Refine Task Type** creates a standard task. After clicking **Create Task**, you cannot return to this screen to select the option to create a next best action task.

5 To create a next best action task, select **Create a stand-alone task that delivers content when it is staged by an external system**. After you create the next best action task, the task is triggered when an external system calls the staging API with a code that matches the code that you entered for the task. The next best action task then delivers a creative if the external system calls the staging API with a matching code and if the system meets any other targeting criteria in the task. For example, a web task delivers a creative to a spot if the staging API received the matching code and the spot associated with the task is being viewed by the customer.

6 Click **Create Task**.

Add Content to Your Task

All the details and items associated with the content that this task shares are specified on the **Content** tab. Select the creative for the offer and click **OK**. You can also set the distribution and impression limits for the creatives.

Add a Spot

You can add either a spot or spot set to the task. While you are designing your task, you can see information about the spot by clicking to open the **Spot** pane. On the **Spot** pane, click to change the spot where the shared content is displayed.

Add Message or Creatives

1 Click to open the **Content Selection** pane.

2 Click **Select Content** to add the content that the task uses when sharing content. Select a message or one or more creatives.

Note: Instead of selecting an existing message or creative to add to the task, you can choose to create a message or creative. To create a message or creative, click **New Message** or **New Creative**. The message or creative that you create is automatically added to the task.

3 Click **Preview in Site** to see how the creatives look on your site before updating it. To select the different creatives associated with a spot, click $\boxed{i}$.

Note: The creatives are ordered by name.

Set Metrics

Metrics measure events that the system can detect. For example, the system can detect certain events such as a person clicking a spot on a web page. Add metrics to measure the success of the content being delivered by the task.

Set a Primary Metric

The primary metric measures conversions to determine the success of the task. There can be only one primary metric. You can either edit an existing primary metric or add a new one and then remove the previous metric.

1 Click **+**.

2 Select the criteria that you want to add. You can select an event view or a data view.

For more information about events, see “User-Defined Events” on page 304. For more information about data views, see “About Data Views” on page 459.

3 If attributes are defined for the event or data view, select the attribute conditions that must be met. For example, for a Click Through metric, you can select a particular creative as an attribute condition. The primary metric would be a click-through response to that creative.

Note: Attributes are joined by an AND operator. Make sure that you do not define conflicting attributes that result in a condition that cannot be met.

4 To mark this selection as a contact or response that can be tracked and used for reporting and future targeting, select **Classify this selection**. Classifying an event or data view enables you to compare contacts and responses across creatives and channels. You can personalize future messages and creatives. You can also use the information to segment customers. You can classify events and data views in both primary and secondary metrics.

To record the number of times that a customer interacts with a creative or a spot, select **Mark this selection as a contact**. This information is available as contact history for SAS Marketing Automation, SAS Real-Time Decision Manager, and other applications.

To mark this selection as a response to a creative, select **Mark this selection as a response**.

5 Select **Stop delivery after conversion** to stop delivering creatives when the primary metric for the task is met.

When delivery of the creatives stops, that same spot might switch to displaying creatives from another task. If there is no other task delivering a creative to that spot, then the spot's default creative is displayed. If there are no other tasks delivering content to that spot and there is no default content defined for that spot, then the spot is empty.

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To set the priority of a task:

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2 Select the number that represents the task's priority over all other tasks that compete for the same resource.

Note: If an A/B test task exists that competes for the same resource, the A/B test task delivers its content regardless of the priority that you set here.

View Usage Information

From the **Orchestration** ⇨ **Usage** tab, you can view which items use the task and the items that the task uses.

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  The list displays items with a Designing, Ready, or Active status. Click **Show Designing Status only** to display only items with a Designing status.

To open an item, click the item. To view item details and to open the item, click ⓘ in the item's row.

Note: HTML assets that are the content source for mobile spot, web spot, and email creatives are not listed.

Schedule and Start Your Task

When you finish updating your task, you can mark the task ready, publish the task immediately, or set a schedule for the task.

Note: When you schedule a bulk email task, a bulk mobile push notification task, or a direct marketing task, allow a minimum of five minutes between the time you publish the task and the scheduled start time for the task to be active. This time delay is needed by the system to process the request.

On the **Orchestration** tab, take these actions:

- Click **No schedule** if you plan to publish the task manually.
- Click **Set a schedule** to set a time period that the task is active.
    - Select a time zone. For example, you might want to select a time zone that is different from the default if the task is targeted to a specific locale. By default, the time zone is the same as the time zone that is set for the tenant. If a valid time zone is not set for the tenant, the default time zone is UCT.
    - Click **Single occurrence** to specify a single time span that the task is active.
    - Select a start date and an end date for the task.

      Note: If you select **Single occurrence**, the start date cannot be edited after the task is published.
    - Click **Recurrence** to specify a recurring task. Click .

      Specify these details for a recurring schedule:
        - **Start time** is the start time for the first occurrence.
        - **Duration** specifies the amount of time that the content is available for each occurrence. For example, a task might start every week on Monday, and continue for four days.
        - **Frequency** specifies that the schedule for the recurrence. If you click **Weekly**, click the day for each occurrence. You can select multiple days in each week. If you click **Monthly**, select the numbered day or the weekday for the recurrence. For example, you can select the 10th day of each month or the second Tuesday of each month.

          Note: You can edit the weekly or monthly frequency after the task is published and the start date has passed. The recurrence must occur within the start and end dates.
        - **Range of recurrence** specifies the start and end dates, or that the recurrence continues without an end date.
    - **Extend metrics analysis** continues collecting data after the last occurrence. Select the number of days to extend data collection. The default value is 7 days. For example, if you use the default value, and the **Start time** is 9:00 PM, data collection continues until 9:00 PM seven days after the **End by** date.

      Customers might respond several days after the last occurrence. You can extend the time for data collection in order to more effectively measure task performance.

      During the extended period of data collection, the status is Active - Metrics Only. The status changes to Complete when the **Extend metrics analysis** period is over.
- Select **Mark Ready** to change the status from Designing to Ready. A Ready status indicates that this item is ready to be published. When you are ready to promote an item from a Ready status to an Active status, click **Publish**.

  Note: When you publish an item, you are prompted to publish any dependent items that are marked Ready.

  Items with a Ready status can be changed back to a Designing status by clicking **Return to Designing**. Changing this status to Designing prevents the item from being published.

  Note: If your item has a Ready status and a start date, the item is not automatically published when the start date is reached. For example, if you are creating a task, it must be published in order for the start date to activate the task.

- Select **Mark Ready and Publish** to change the status from Designing to Active. Items with an Active status cannot be changed back to Designing.

Changes to a scheduled or active task are not automatically propagated to the published version of the task. You must republish the task after you save it to resolve the Out of Sync status. Otherwise, the task stays out of sync with the published version and the updates are not delivered.

When the end date of a task is reached, its status changes to Complete. Completed tasks cannot be modified. The task stops any associated data collection and makes the task's content unavailable. In addition, any unsaved changes are lost.

Note: A recurring schedule is not available if the task is included in an activity.

End the Task

When your task is running, it collects data and gathers information about progress toward your metrics. Navigate to the **Insights** tab to check the progress of your task.

Click **End** on the **Orchestration** tab when you no longer need the task to deliver content or when the scheduled end date is reached. The status changes from Active to Complete. Completed tasks do not deliver content to a spot, and cannot be modified. Any unsaved changes to the task are lost.

Add Properties to Your Task

There are two types of properties that are associated with a task:

Properties that Identify the Task

Examples of properties that identify the task include **Description** and **Code**. To update task properties, click the **Properties** tab and modify the values in the fields as desired.

An item can be identified by its code for activities such as auditing and reporting. When an item is imported or migrated to SAS Customer Intelligence 360, the existing code value for the item is retained. Depending on the code settings for your environment, the code value might be editable. This value is not required to be unique to be valid. If the value is editable, you can change it to match the code value for another item. Valid characters for codes are alphanumeric characters, multi-byte characters, numerals, underscores, hyphens, and periods. Blank spaces are not allowed in code formats.

The **Code** field enables marketers to use a segment map to target customers based on their internal attributes (account type, balance, and so on) and their previous interactions. These codes are used to communicate information about the targeted customers to vendors or downstream systems. Using codes can minimize errors in text and punctuation that might occur when using an item name that is typically lengthy.

The information in the **Code** field can be used for operational reporting. The information can also be used to select or suppress customers for targeting messages (for example, a marketing message might target or exclude all customers who responded to direct marketing task *12345*).

Properties Used for Plans

To add planning information to a task, open the task and click . For more information, see “Creating a Planning Item” on page 259.

To return to the task view after opening the planning view, complete one of these actions:

- Fill out the required planning properties and save the task.
- Navigate to the **Tasks** view and click the task from the list.

Using Save as to Create a Task

To save a task with a different filename, click ⋮ and select **Save As**. Enter a name and click **Save**.

Monitor Your Web Task

The **Insights** tab of a web task contains information about the task and its performance. For example, you can see details about metric performance and reports. Use the information available on this tab to monitor your web task.

Summary

The **Summary** tab displays general information about the task and its creatives, giving you an at-a-glance view of how the task is progressing. The data here is based on unique users. For example, if you visit a site twice, your duplicate visits are removed and you are counted as one user.

You can see details about the task, such as the following information:

- status of the task
- dates, such as the date on which the task was last published, the date of the most recent update, and how long the task has been active
- population counts, such as the number of unique users that have been included in the task

On the **Summary** tab, you can also see some details about creative performance, such as the following information:

- Data for each creative, including unique user counts and conversion rates.

- The conversion rate for the primary metric for the task’s creative. Use the **Creative Conversion Rate** section to explore data related to the creative’s conversion rate. You can select **Show value markers** to add data points to the lines in the graph, and refine the time period that the graph displays by moving the sliders below the graph.

Performance

Performance is where you specify the primary and secondary metrics while you are designing your task. As the task progresses, details about all available metrics and creative performance are updated on this tab. The data available on this tab is user based and includes only unique users. For example, if you visit a site twice, your duplicate visits are removed and you are counted as one user.

In addition to viewing metric and creative data, the tab also includes an option to stop delivering creatives when the primary metric for the task is met. If this is selected and this task stops delivering creatives, any of the following actions might occur:

- That same spot might display a creative from another task.
- If there is no other task delivering a creative to that spot, then the spot's default creative is displayed.
- If there are no other tasks delivering content to that spot and there is no default content defined for that spot, then the spot remains empty.

> **TIP** You can find the three web tasks with the highest conversion rates on the **Home** page for SAS Customer Intelligence 360.

Report

Use the User Results report to display how key metrics are performing by total users in your task. The user-based metrics in this report include duplicate users. For example, if you visit a site twice, you are counted as two users.

Use the date slider to specify the range of dates for the data that you want to see. The dates are the beginning dates and end dates for the data that is available for the test task. For more information about using the report and the data in the report, click **Get more report details**.

Select the following tabs to display information:

- Click the **Overview** tab to see how key metrics performed by total users in the task.

  For each metric on this tab, click the **View Metric Formula** link to display the definition and the formula for the metric. The following metrics are displayed on this tab:

  - Impressions delivered is the total number of times that a creative is delivered to all users.
  - Impressions viewable is the total number of times that a creative is delivered and viewable by all users.

- Conversions is the total number of times that the users satisfy the primary metric.

- Click the **Conversion Ranks** tab to display the creatives, dates, devices, and browsers with the most and fewest number of conversions.
- Click the **Impressions/Conversions** tab to display the pattern of user behavior by impressions delivered, impressions viewable, and conversions for each creative.
- Click the **Cumulative Impressions/Conversions** tab to display the cumulative count of conversions, impressions delivered, and impressions viewable for each creative.
- Click the **Conversion Counts** tab to display which variant, device, and browser generated the most conversions.
- Click the **Conversions Over Time** tab to display the trend of conversions by creative, device, and browser over time.
- Click the **Browsers** tab to display the total conversions by browser type and the pattern of conversions that were generated using each browser over time.
- Click the **Devices** tab to display the total conversions by device type and the pattern of conversions that were generated using each device over time.

PART 15

Using Activities to Meet Your Goals

53

Creating Activities

About Activities

An activity is a coordinated series of tasks that are designed to meet the goals of a marketing campaign. An activity uses tasks and events. An activity map charts the customer paths between tasks, such as sending a particular message through a particular channel, and conditions, such as the primary metric and evaluation periods. For example, you might use a web task to present a Hotel Offer link on your website. Then, you could use an email task to send a discount offer to all users who click on the link within a week.

Activities can be associated with plans. When creating an activity from a planning item, you are required to enter only an activity name before saving the activity. Activities that are created without all the required information are assigned a Planning status and can be updated later with the required information. In this manner, a marketer can create a placeholder activity that is updated later by a person familiar with activity maps.

After an activity is published, it is active until it ends. Customers can interact with the activity at any time, and progress at their own pace.

Creating an Activity Map

Open a New Activity Map

1 From the navigation bar, click **Activities**.

2 Click .

Add Start Tasks and Trigger Events to the Activity Map

The first step in building an activity map is to select start tasks and trigger events as the entry points into the activity. You can add multiple start tasks and trigger events. For information about creating an activity map with multiple starting points, see “Create an Activity with Multiple Starting Points” on page 753.

Add a Start Task

The Start task identifies the message, channel, segment, and other components that are designed to achieve the marketing goal.

1 Click + in the Start column of the activity map.

2 Select **Task**.

3 Select a task from the list of created tasks or create a new task.

- The types of tasks that you can start an activity with include: mobile spot, in-app message, bulk email, bulk push notification, and web. You cannot select a triggered email task or a triggered push notification task as a Start task.
- If you select a task that has already been published or a task that is included in another activity, you are prompted to make a copy of the task. The copy is used in the current activity map.
- To create a task to add to the activity, click **New Task**.

Add a Trigger Event

With a trigger event, you can select customers based on their actions. For example, you can select customers who click a link on a web page. A trigger event can be followed by a Task node, a Wait node, or an A/B Test node.

1. Click **+** in the Start column of the activity map and select **Trigger Event** to add an event.
2. In the **Event Details** window, click to select the event.
3. When you add an event to your activity, you can change the occurrence and time period of the event. The occurrence defines how often the event must occur so that a person is eligible for the activity. The time period defines when the event must occur in order to be eligible. By default, an event must occur at least once in the past week.

   To change the occurrence or time period of this event, click and set the event occurrence details.

   Specify the number of times the event must occur in order for a person to be eligible. Set an operator and value for **Occurrences**. For example, you can set the **Occurrence** to **Less than (<)** 5. This setting specifies that an event must occur at most four times in order for a person to be eligible.

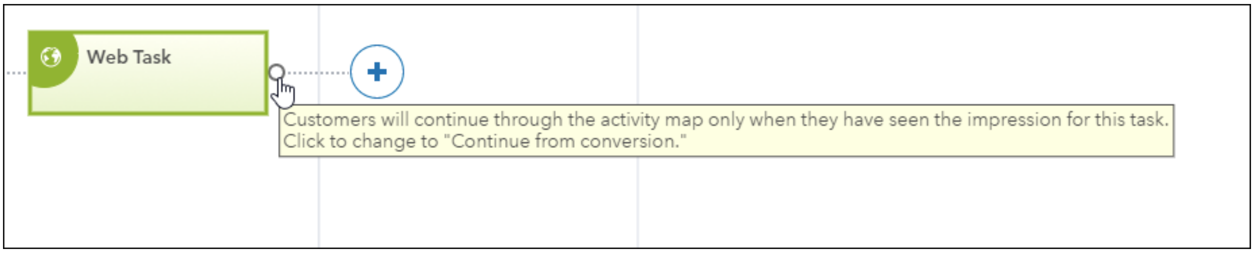
   Set the time period in which all occurrences must occur:

   - Select **Relative** to define a time period relative to the current time, such as within the previous week or the previous hour.
   - Select **Absolute** to define a time period with specific dates. For example, you can set the time period so that the event occurs at least one time before a specified date or between two specified dates.
   - Select **None** when you do not need to define a time period for the event. Events that are added to an activity and do not have a defined time period are eligible anytime that they occur.
4. If the event contains attributes, click **+** to add more conditions. For example, you can specify a product name if the event has a product name attribute.

Continue from Impression or Conversion

You can control whether a customer continues through the activity map based on seeing an impression or on meeting a primary metric in a task. Click the icon on the task to select **Continue from conversion**.

Figure 53.1 Click Icon on Task



The icon changes to .

If you select **Continue from conversion**, the task cannot be followed by a split.

For information about setting default values, see "Activity Settings" on page 43.

Add Tasks

Add tasks to the path after the Start task or trigger event by clicking +.

Customers can proceed through a triggered email task only if the email task is active. If an email task is not active, customers do not continue along the path.

You cannot add a bulk email or bulk push notification task after the Start task or trigger event. Email and push notification tasks that are added to the path must be triggered.

CAUTION! Under some circumstances, users might receive duplicate emails. Duplicate emails can be sent to the same customer if the customer signs in to a website, and if the same customer views the website without signing in or signs in as "guest."

Split According to Customer Behavior

Add a Split

A split enables the activity designer to decide how to treat customers according to their behavior. The customer behavior is based on the primary metric of the preceding task. Behavior can be defined by primary metrics, impressions, or other conditions. For example, you can create a path for customers who do not meet a primary metric within a specified amount of time. An additional task, such as sending another discount offer, could be added to the path for these customers.

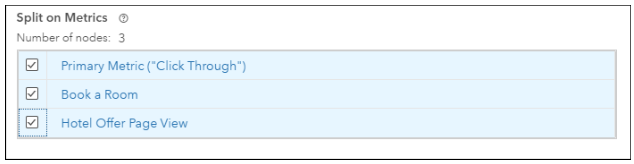
Click + and select **Split** to add a split to the activity map.

Create New Paths That Are Based on Metrics

The metrics that are used in the split are defined in the preceding task. Secondary metrics have separate paths. Select the metrics that you want to include as output paths from the split.

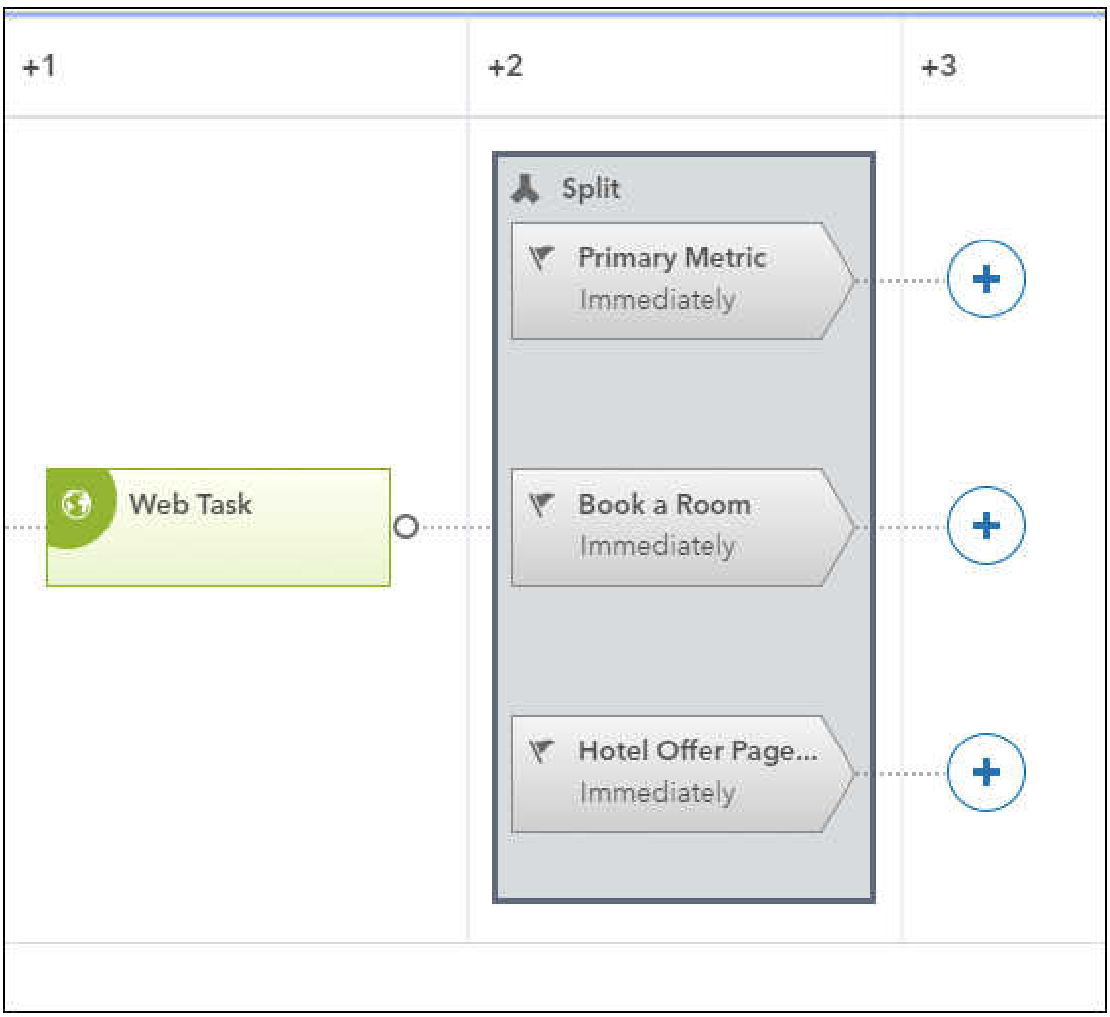
In the following **Split Properties** window, a primary metric and two secondary metrics have been defined by the preceding task. All of the metrics have been selected.

Figure 53.2 Split on Metrics



Three output paths are created by the split when you click **OK**.

Figure 53.3 Output Paths



The output paths are evaluated immediately.

Note: A task might use the same data view or event more than once. For example, the same data view can be selected as both a primary metric and a secondary metric. In this case, duplicate paths are generated. Duplicate paths are invalid. When you select metrics in the split, make sure that they are based on different data views and events or that different attribute conditions are specified for each occurrence in a single data view.

Create a New Path That Is Based on Conditions

You can also create an output path that is based on conditions that include a trigger period and an evaluation period. If an output path is based on conditions, there is a waiting period before the conditions are evaluated.

In the **Split Properties** window, click **Add Split**.

You can then specify the following conditions for creating additional output paths from the split:

Trigger for evaluation period
: A trigger is an event that starts the evaluation period. Select a trigger.

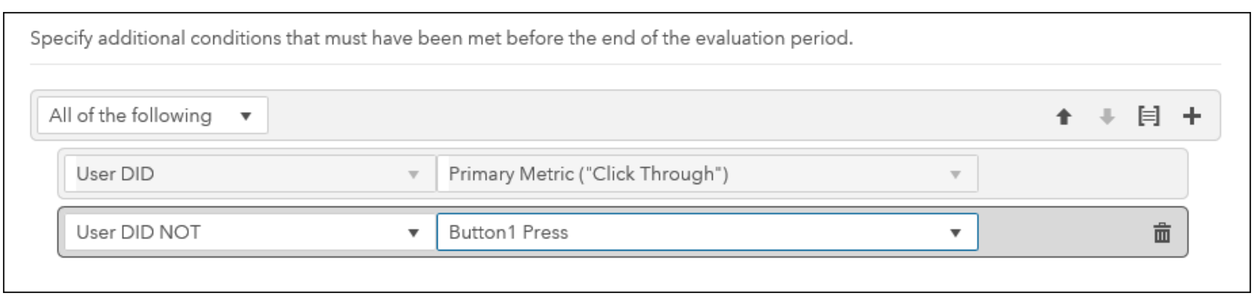
Evaluation period
: Set the length of time to wait before evaluating the conditions and determining whether the customer is qualified to follow the path.

  The minimum time possible is 5 minutes. Minutes must be specified in multiples of 5.

  The maximum time possible is one year. A year is equal to 525,600 minutes or 8,760 hours or 365 days or 52 weeks or 12 months. A month is equal to 30 days.

Additional conditions
: The additional conditions are derived from the task metrics. For example, you can specify a condition that selects customers who clicked through but did not meet the primary metric within an hour of the impression. Click to group the conditions.

Figure 53.4 Set Additional Split Conditions



Click **OK**. The Split on Conditions section in the **Split Properties** window displays the conditions for the split. By default, only users who qualify during the evaluation period are included. Click ⋮ and select **Include all qualified users** to include all users who meet the conditions, whether before or during the evaluation period.

Additional conditions are valid if they are met during the evaluation period, or before the evaluation period begins. If multiple conditions have the same trigger and the same evaluation period, an output path is assigned randomly to each customer. Each customer follows only one output path.

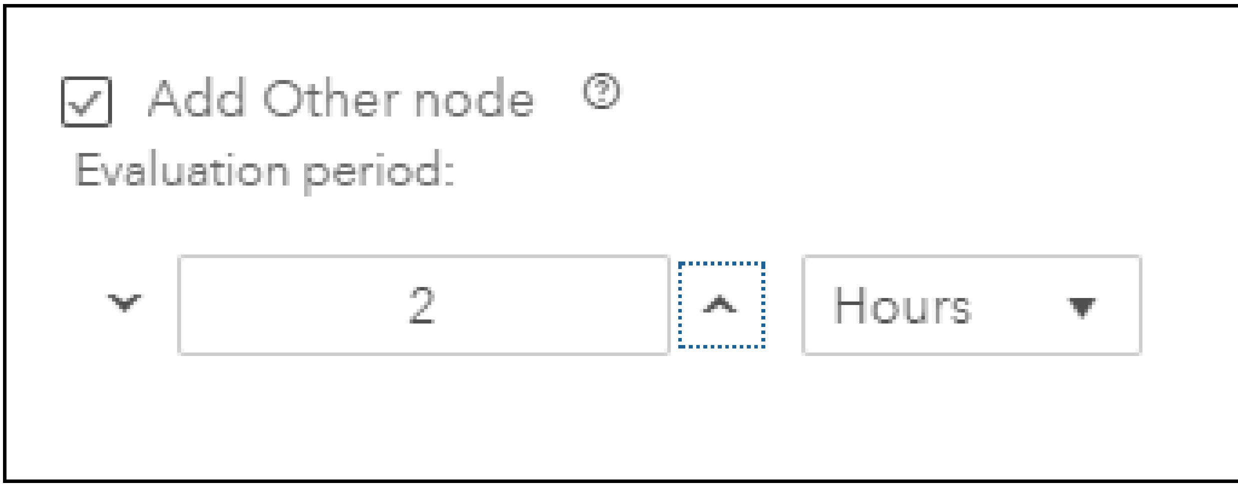
Create a Path for Customers Who Do Not Follow Any Other Output Path

There might be customers who do not meet any of the metrics or conditions that you have set.

Click **Add Other node** to create an output node that contains customers who have not followed any other output path from the Split node.

The customers are evaluated at the end of the evaluation period for the Other node. The evaluation period begins when a customer sees an impression in a web or mobile task.

Figure 53.5 *Add Other Node*

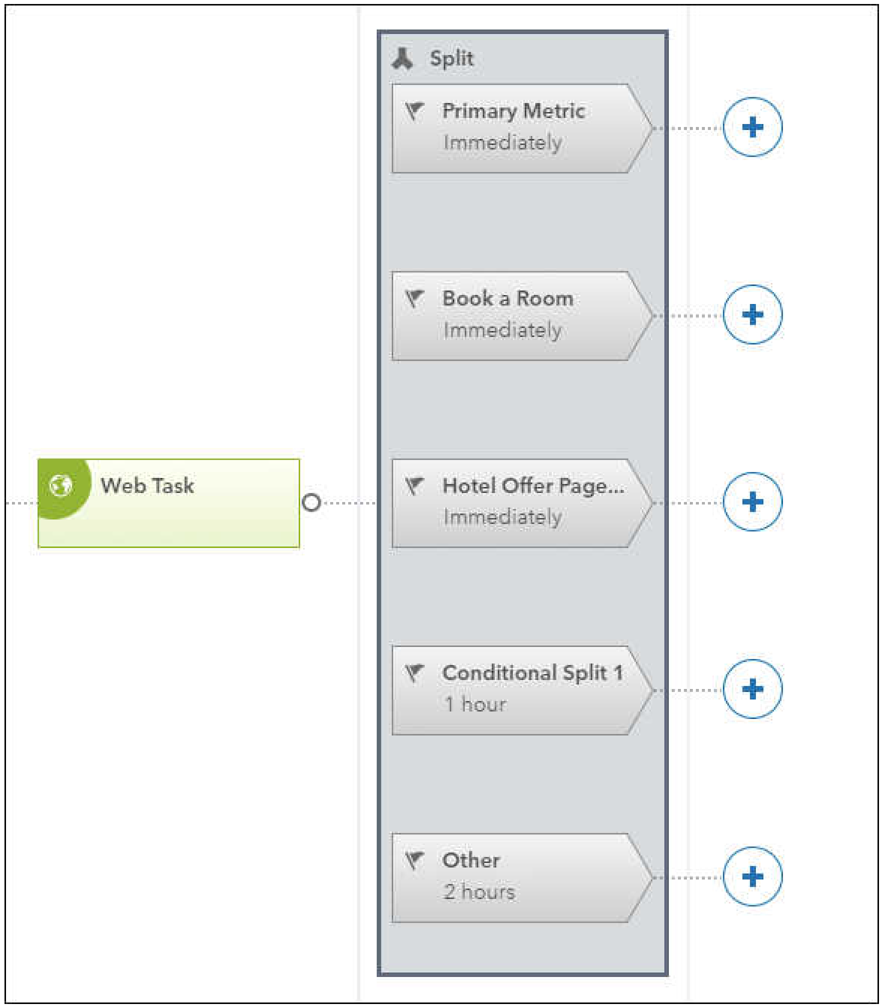


The evaluation period for the Other node should be longer than the evaluation period for any conditional Split nodes. The Other node might not be evaluated after the other Split output nodes. The evaluation period for the Other node is triggered by an impression. The evaluation periods for conditional split nodes might not be triggered by impressions. The maximum time possible for an evaluation period is 10 years. Ten years is equal to 87,600 hours or 3,650 days or 520 weeks or 120 months. A month is equal to 30 days.

The Other node is the lowest priority path. If a condition and an Other node have the same trigger and the same evaluation period, qualified customers follow the conditional output path instead of the Other node.

In Figure 53.6, a split has been configured to produce output paths for metrics, additional conditions, and an Other node. You can add downstream paths after each of the output paths.

Figure 53.6 Paths for Metrics, Additional Conditions, and Other Node



Add a Wait Period

A Wait period sets the amount of time to wait between the completion of the previous task or evaluation period and the start of the next task or Wait period in a path. For example, you can add a Wait period that sets an interval of two hours between a Click Through event and an email message.

Click + and select **Wait** to add a Wait period to the activity map.

You can set two types of wait periods:

- Select **Relative period** to specify the amount of time until the wait period ends.

  The minimum time possible is 5 minutes. Minutes must be specified in multiples of 5.

  The maximum time possible is 10 years. Ten years is equal to 87,600 hours or 3,650 days or 520 weeks or 120 months. A month is equal to 30 days.

- Select **Specific date** to specify the date on which the wait period ends.

A Wait period can be followed by a task or another Wait period. If a Wait period is the last node in a path, you cannot publish the activity.

Start Multiple Paths from One Node

Use an activity to create a multi-channel experience for your customers by using multiple paths that originate from the same node. Because a customer moves concurrently through all of the paths that originate from a single node, you can provide coordinated experiences in many channels. For example, you can set up an activity map so that there are three paths originating from a single node. At the same time that one path delivers a coupon via email, the second path displays an advertisement on a web page. A third path shows a different advertisement in a mobile application.

To create multiple paths from the same node:

1. Right-click the node that your new path originates from.
   - The node that you start the new path from must have at least one node after it.
   - There is no restriction on the number of paths that you can start from a single node.
   - The new path cannot begin in a column that contains a Split node.
2. Select **Insert** ⇨ **Path**.
3. Select the type of node to use for the new path. Add more nodes to complete the path.
4. Locate the node from which your new path originates. Right-click that node and select **Insert** ⇨ **Path** to add more nodes and create additional paths.

   Note: All of the paths in an activity must connect. That is, a path cannot be completely independent of the other paths in the activity.

Create an Activity with Multiple Starting Points

Overview

To respond to different customer behaviors, you can create an activity map with multiple starting points. When you create an activity with multiple starting points, all of the paths must connect. That is, a path cannot be completely independent of the other paths in the activity.

There is no restriction on the number of starting points that you can add. You cannot connect a path to a node that is inside an A/B Test node.

To connect one node to another:

1. Click **+** after the node that you want to connect to another node.
2. Select **Connect to Node**.

3 Select the node that you want to connect to, and then click **OK**.

Example

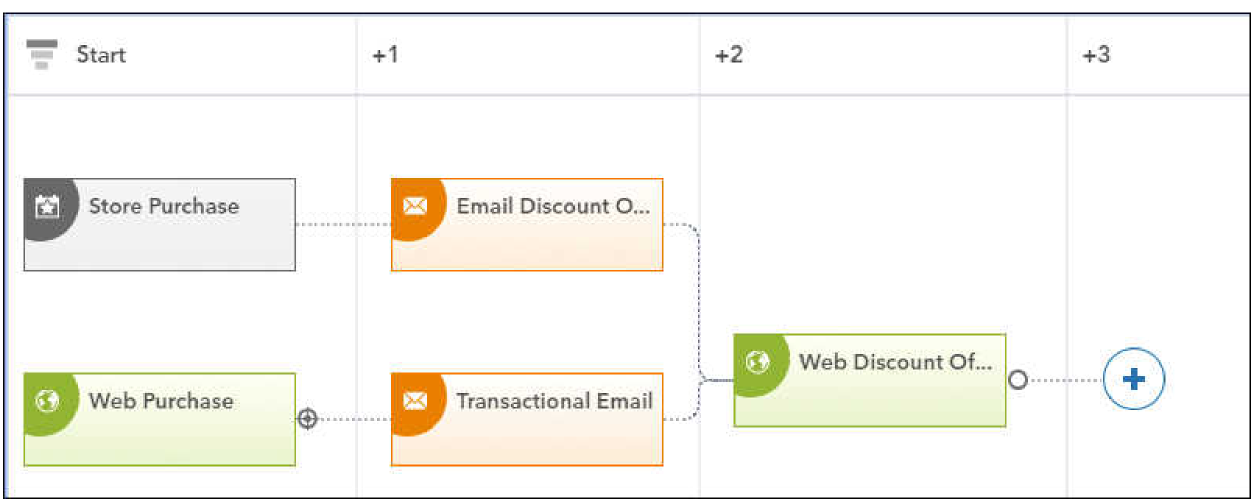
Suppose that you want to respond to a web purchase and a store purchase with the same offer. In the activity map, you add a Start task that has a primary metric of a web purchase. The Start task is followed by a transactional email task that thanks the customer for the purchase. The email task connects to a web task that offers a discount.

In the same activity map, a store purchase event is followed by an email task that contains an embedded discount offer. This email task connects to the same web task.

To construct the activity map, you add a Start task whose primary metric is a web purchase. You select **Continue from conversion** so that the customer continues when the primary metric of a web purchase is met. You connect an email task to the Start task. The email thanks the customer for the purchase and includes a link to a discount offer on the web. In the activity map, the email task connects to a task that contains the web offer.

You then add a trigger event as the second starting point in the activity. The trigger event is a store purchase. Click **+** after the trigger event and add an email task with an embedded discount offer. Connect the email task to the task that contains the web offer.

Figure 53.7 Multiple Starting Points



Manage Nodes

Right-click a node in the activity map to display a pop-up menu. The menu items depend on the type of node and its location in the map. You can select these menu items:

Add path variant
In an A/B Test node, **Add path variant** enables you to add a path variant and specify whether it is a Champion.

Adjust distribution
In an A/B Test node, **Adjust distribution** enables you to select the distribution for each of the path variants in the node.

Continue from conversion
In a Task node, **Continue from conversion** allows customers to continue through the activity map only if they have reached the primary metric for the task.

Continue from impression
In a Task node, **Continue from impression** allows customers to continue through the activity map only if they have seen the impression for the task.

Edit
In a Task node, **Edit** opens the underlying task for editing. In a Split node, **Edit** opens the **Split Properties** window for editing.

Insert node (after)
In a Task node that is followed by another node, **Insert** ⇨ **Insert node (after)** inserts a node on the path immediately after the selected node. Select the type of node to insert.

Insert path
In a Task node that is followed by another node, **Insert** ⇨ **Insert path** inserts an additional path from the selected node. Customers are eligible for both paths.

For example, a task makes an offer to new customers. After the first task, you insert paths to make three follow-up offers after the customers meet the primary metric for the first task. All three follow-up offers are made at the same time.

Remove node
Removes the selected node.

Remove path
If a node is followed by other nodes, **Remove path** removes all the nodes on the same path, including the selected node.

Collapse an A/B Test node by clicking in the corner of the node. Expand an A/B Test node to display its contents by clicking .

Add Properties to an Activity Map

There are two types of properties that are associated with an activity map:

Properties that Identify the Activity Map

Examples of properties that identify the activity map include **Description** and **Code**. To update the properties, click the **Properties** tab and modify the values in the fields as desired.

An item can be identified by its code for activities such as auditing and reporting. When an item is imported or migrated to SAS Customer Intelligence 360 , the existing code value for the item is retained. Depending on the code settings for your environment, the code value might be editable. This value is not required to be unique to be valid. If the value is editable, you can change it to match the code value for another item. Valid characters for codes are alphanumeric characters, multi-byte characters, numerals, underscores, hyphens, and periods. Blank spaces are not allowed in code formats.

The **Code** field enables marketers to use a segment map to target customers based on their internal attributes (account type, balance, and so on) and their previous interactions. These codes are used to communicate information about the targeted customers to vendors or downstream systems. Using codes can minimize errors in text and punctuation that might occur when using an item name that is typically lengthy.

The information in the **Code** field can be used for operational reporting. The information can also be used to select or suppress customers for targeting messages (for example, a marketing message might target or exclude all customers who responded to direct marketing task *12345*).

Properties Used for the Plans

To add planning information to a activity, open the activity and click . For more information, see "Creating a Planning Item" on page 259.

To return to the activity view after opening the planning view, complete one of these actions:

- Fill out the required planning properties and save the activity.
- Navigate to the **Activities** view and click the activity map from the list.

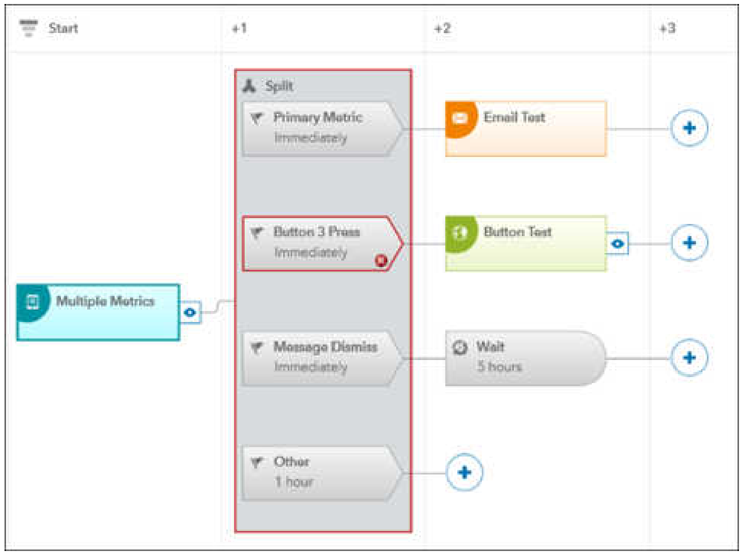
Edit Tasks That Are Used by an Activity

From an Activity Map

You can edit a task from an activity map by double-clicking the task node.

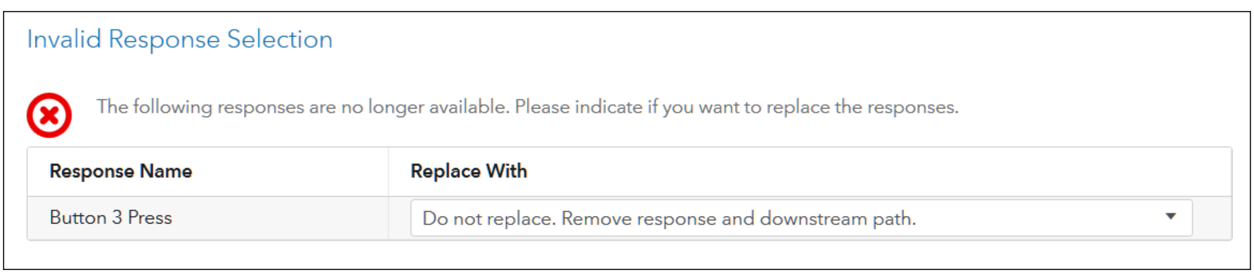
Modifications to an existing task might cause the activity to be invalid. For example, if you remove a secondary metric from a task, a Split that contains an output path for that metric is invalid.

Figure 53.8 Invalid Split



Double-click the node to solve the problem.

Figure 53.9 Invalid Response Selection



You can remove the missing metric and the downstream path, replace the missing metric with another metric from the task, or change the output path to a conditional split or an Other node. You can move the output path to another output node only if the other output node does not already have a downstream path.

From the Activities Page

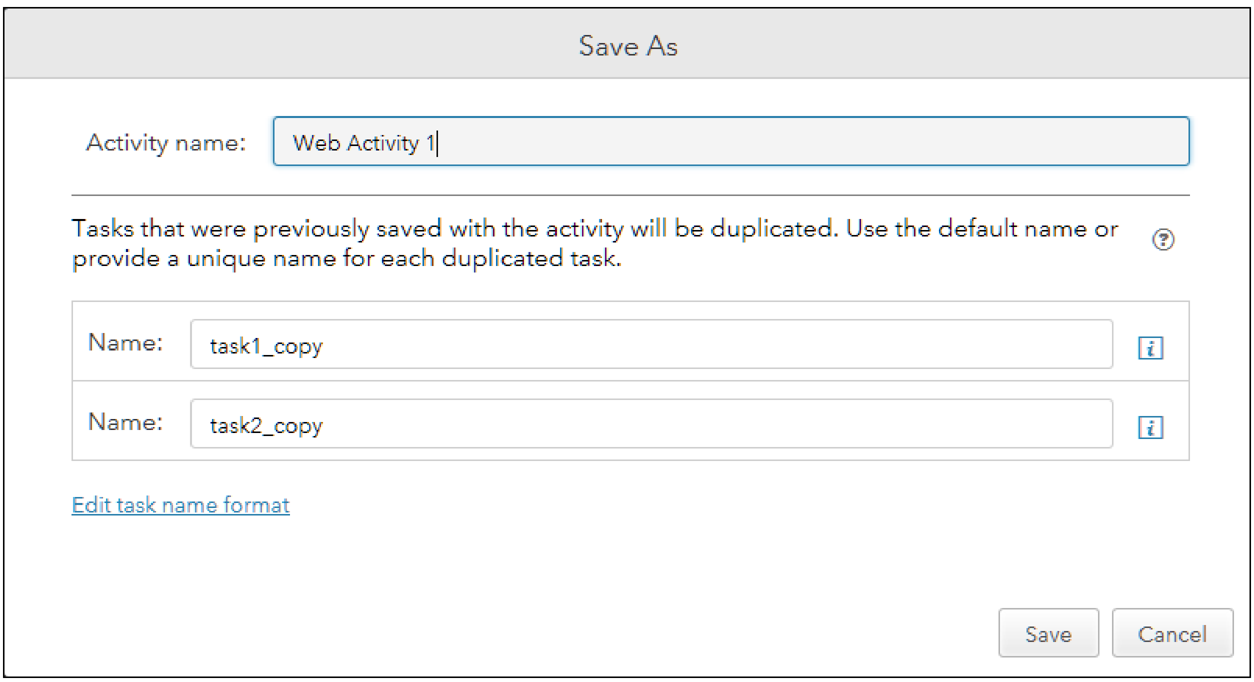
You can view and open tasks for editing from the **Activities** page. When you click **Activities** from the navigation bar, the activities are displayed.

Expand an activity to list the tasks that are used in that activity. Click a task to open it.

Make a Copy of an Activity

You can make a copy of an activity by saving the activity under a different name. Click ⋮ and select **Save as**.

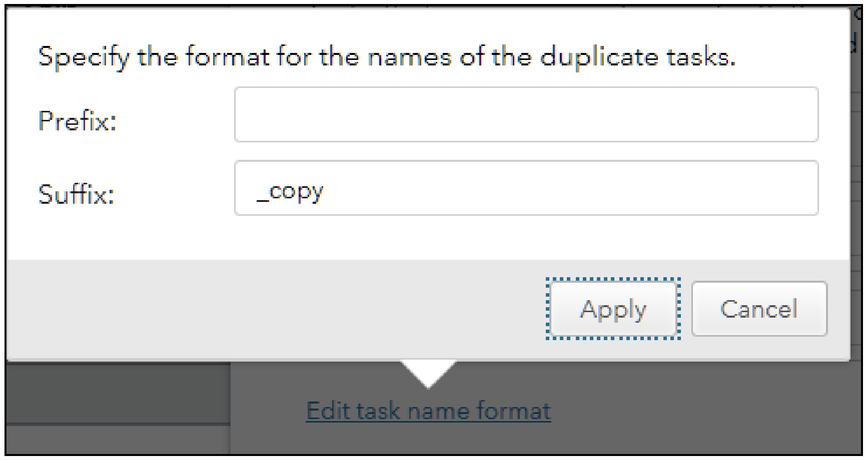
Figure 53.10 *Save a Copy of an Activity*



Activity names and task names must be unique. The default name for the copy is *activity name*_1. You can change the name of the copy and the names of the individual tasks.

Tasks that have been saved with the original activity are copied. The default name of a copied task is *task name*_copy. You can edit the task name or click **Edit task name format** to change the name format for all tasks in a copied activity.

Figure 53.11 Edit Task Name Format



You can use the default suffix or supply your own prefix or suffix for the task name. For example, you could enter `myactivity_` in the **Prefix** field.

Validate the Activity Map

When you finish adding paths to your activity map, click to ensure that the activity map is valid.

An activity is also validated when it is saved. You cannot save an invalid activity.

Add Activity to Plan

To add an activity to Operations as a planning item, open the activity and click . For more information, see “Creating a Planning Item” on page 259.

Click to return to the open activity from Operations.

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Schedule and Publish Your Activity

Schedule an Activity

Specify a schedule that defines how long the tasks in the activity deliver content and collect data.

1. Navigate to **Orchestration** ⇨ **Schedule** and click **Set a schedule**.
2. Select a time zone. For example, you might want to select a time zone that is different from the default if the activity is targeted to a specific locale. By default, the time zone is the same as the time zone that is set for the tenant.
3. Enter a start date and an end date by clicking in each field and selecting a date from the calendar.

   Note: The start date cannot be edited after the activity is published.

If a task does not have a schedule, the task follows the activity schedule. If an activity does not have a schedule, tasks within the activity follow their own schedules. If a task does not have a schedule and an activity does not have a schedule, the task and activity are published and ended manually on the **Orchestration** tab.

If both the activity and tasks have their own schedules, task schedules are valid within the bounds of the activity schedule. If the task schedule starts before or ends after the activity schedule, the activity is not valid. To modify the schedule of a task, click ⋮ next to the task name.

After the activity is published, its status changes to Active at the scheduled start date. A task that has an independent schedule remains inactive until the start date for the task. If you publish an activity with no set schedule, the activity is active immediately. Users enter the activity flow when the first task becomes active.

Changes to a scheduled activity are not automatically propagated to the published version of the activity. If you update a scheduled activity, republish the activity to incorporate the updates. If the activity is not republished, then the activity becomes out of sync.

Note: When you republish an activity, all existing data for the activity is deleted.

Publish an Activity

You publish your activity after you create it. The tasks in an activity do not deliver content until the activity is published. On the **Orchestration** tab, click **Mark Ready and Publish** to publish the activity and its tasks. In order for the activity to be published, the status of all of the tasks in the activity must be marked Ready. When the activity is published, the status of the tasks is changed to Active. Tasks might not be active for several minutes after the status has changed.

Changes that are made to a scheduled or active activity are not automatically propagated to the published version of the activity. If you update an activity, republish the activity to incorporate the updates. If the activity is not republished, then the activity becomes out of sync.

The status of the publishing process is displayed in the upper left corner of the **Orchestration** tab. If the publishing process failed, click to display the error messages.

If an activity does not have a defined schedule, the status of the activity is changed to Active as soon as the activity is published. The activity continues until you select **End** from the menu to end the activity. When an activity ends, customers who are partway through the activity map do not continue. All tasks are stopped. The status of the tasks changes to Completed.

For information about scheduling activities, see “Schedule an Activity”.

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Monitor Your Activity

Set Metrics

Metrics measure events that the system can detect. For example, the system can detect certain events such as a person having purchased enough of a product to qualify as a Platinum member. Add metrics to measure the success of the content being delivered by the activity. Add a primary metric and additional secondary metrics in the **Performance** section of the **Insights** tab.

Add Metrics

The primary metric measures conversions to determine the overall success of the activity. Secondary metrics measure other benchmarks that you are interested in. An activity can have multiple secondary metrics. Each secondary metric can have only one data view or event.

To add primary and secondary metrics:

1. Click **Add Primary Metric**.
2. Select the criteria that you want to add. You can select an event view or a data view.

   For more information about events, see "User-Defined Events" on page 304. For more information about data views, see "About Data Views" on page 459.
3. If attributes are defined for the event or data view, select the attribute conditions that must be met. For example, for a Click Through metric, you can select a

particular creative as an attribute condition. The primary metric would be a click-through response to that creative.

Note: Attributes are joined by an AND operator. Make sure that you do not define conflicting attributes that result in a condition that cannot be met.

4 Click **Add Secondary Metric** to add a secondary metric.

Modify Existing Metrics

You can change the settings for an existing metric.

Note: The action icons for a metric are only visible when the metric has focus. For example, a metric has focus when you tab to it or when you move your mouse over the metric.

- Click to update the metric details.
- Click to remove a metric.

View Usage Information

From the **Orchestration** ⇨ **Usage** tab, you can view the items that the activity uses.

The ability to view dependencies between items enables you to see the items that a task depends on to work successfully. Usage information helps you identify how changes that you make to one item might affect another item.

Items That Use the Activity

The first section shows the items that use the activity. Because an activity is not used in other items, the list is empty.

Items That the Activity Uses

The second section shows items that the activity uses.

- Click **Directly Related** to list the items that the activity uses. For example, if an activity uses a task, the task is included in the list.
- Click **All Related** to view directly related items as well as any items that those directly related items use. For example, you might see the task that the activity uses, the creative that is used by the task, and the asset that is used by the creative.

  The list displays items with a Designing, Ready, or Active status. Click **Show Designing Status only** to display only items with a Designing status.

To open an item, click the item. To view item details and to open the item, click ⓘ in the item's row.

Note: HTML assets that are the content source for mobile spot, web spot, and email creatives are not listed.

Activity Insights

The **Insights** tab displays information about the activity's performance and a report that categorizes the collected data.

Performance

The **Performance** section displays the performance of a published activity based on the metrics that you have specified.

The published activities with the three highest conversion rates are listed on the SAS Customer Intelligence 360 **Home** page.

A conversion occurs when a primary metric is met. The conversion rate is the number of unique visitor conversions divided by the number of unique visitor impressions or sent messages.

Reports

You can view reports for a published activity. Reports are displayed in the **Reports** section on the **Insights** tab. Click the report tabs to display different categories, such as **Conversions by day**. Click ⋮ to refresh report contents, print the report, or email the report.

PART 16

Insight Reports

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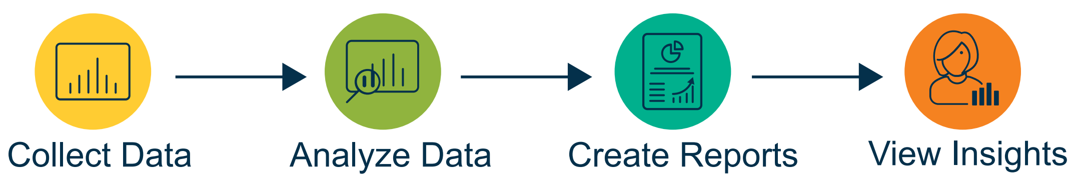
Insight Overview

About Insight Reports



SAS Customer Intelligence 360 provides reports that give you email summary data, a quick overview of user behavior on your site, and real-time information on the tab from the navigation bar.

Note: To view reports, you must be assigned the Reports Viewer role. For more information, see “About User Roles” on page 77.

The email summary report provides information about your email campaign. You can also select specific email tasks to analyze their performance. For more information, see “About the Email Summary Report” on page 797.

The Discover reports contain detailed data about website visitors and their activities during a browsing session. Use these reports to monitor the overall status of various aspects of your business. For more information, see “About Discover Reports” on page 772.

Note: You must have a license for SAS 360 Discover to view Discover reports.

The real-time reports provide information about email, mobile application, or push notification tasks for the preceding 24 hours. Within each report, you can switch among the real-time tasks to view individual tasks. The real-time reports also appear under the **Insights** tab for the specific email, mobile application, or push notification task. For more information, see “About Real-Time Insights” on page 793.

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Discover Insights

About Discover Reports

SAS Customer Intelligence 360 provides predefined Discover reports. These reports present segmented data that shows detailed information about website visitors and their activities during a browsing session

You can open predefined Discover reports by clicking from the navigation bar.

You can also open the reports by clicking ≡ and **Report Viewer**. In the Report Viewer, click **Browse Reports**. The predefined reports are in the `My Insights/Discover Reports` folder.

Standard filtering options include date range, visitor type, device type, and bounce status. Additional filtering options such as site section might be available, depending on relevancy to the report type.

The following are the predefined Discover reports:

- **Advertising and Campaigns**: Uses the highest number of conversions or highest number of visits to evaluate overall marketing performance. For more information, see “Advertising and Campaigns Report” on page 773.
- **Business Processes**: Analyzes the success and abandonment rates of multi-step business processes. For more information, see “Business Processes Report” on page 776.
- **Content**: Analyzes the most-visited URLs, entry pages, and exit pages. For more information, see “Content Report” on page 778.
- **Downloads**: Analyzes content that has the highest download rate. For more information, see “Downloads Report” on page 780.
- **Ecommerce**: Analyzes product performance, purchases, and revenue over time. For more information, see “Ecommerce Report” on page 781.
- **Forms**: Uses the highest number of completed forms and highest number of abandoned forms to analyze user interaction with forms. For more information, see “Forms Report” on page 783.
- **Goals**: Analyzes the highest-performing goals. For more information, see “Goals Report” on page 785.
- **Internal Searches**: Analyzes the effectiveness of internal searches in locating information. For more information, see “Internal Searches Report” on page 786.
- **Media**: Uses the highest number of views or highest total viewing time to evaluate media content. For more information, see “Media Report” on page 788.

- **Promotions**: Uses the highest number of displays or highest number of click-throughs to evaluate site-specific promotions. For more information, see “Promotions Report” on page 789.
- **Visits**: Analyzes types of visits and tools that are used to access websites. For more information, see “Visits Report” on page 790.

You can filter the charts, graphs, and tables in the reports to display or compare metrics. The reports are created from detail mart tables and Discover base tables. For more information, see “SAS Customer Intelligence 360 Streaming Data Platform” on page 1022 and “Discover Base Table Mart Tables and Columns”.

Advertising and Campaigns Report

About the Advertising and Campaigns Report

The Advertising and Campaigns report uses the highest number of conversions or highest number of visits to evaluate overall marketing performance. Marketers can use the report to understand which promotional activities are meeting the projected goals. This understanding enables organizations to make adjustments to marketing campaigns, website design, website performance, products, or services in order to provide a better opportunity to meet their goals. In addition, decision makers can rely on the information provided in the reports to help determine how to adjust marketing investments.

The report can yield the following information:

- a comparison of visits and conversions
- the origin of the website visitors
- identification of search engines that visitors use to access the website
- areas of the website that are attracting the most visits

Understanding the Advertising and Campaigns Report

You can view the following metrics in the Advertising and Campaigns report:

Average Visit Duration (seconds)
: the average length of time, in seconds, that a visitor stayed on the site while viewing one or more pages.

Bounce Rate
: the percentage of site visitors who exit the site after viewing a single page or resource.

Conversion Rate
: the rate of conversion that occurs for an indicated resource within the date range specified. This value is calculated as Conversions divided by Visits.

Conversions
: the total number of visitors who have performed an administrator-defined task that results in conversion recognition. A conversion can be converting a visitor to a customer or any other administrator-defined behavior. By default, a conversion is the achievement of at least one defined goal during the visit.

Exit Pages
: the number of times this page was the last page seen in a visit.

% of Exit Pages
: the percentage of the total number of exit pages.

New Visitors
: the number of first-time visitors to the specific digital domain or domains within the defined date range. A new visitor has an assigned ID (cookie or other identification) that has not been tracked by the data to date.

% of New Visitors
: the percentage of the total number of new visitors.

Page Views
: the aggregate number of times that any page is accessed, counted across all site visitors within the specified date range.

% of Page Views
: the percentage of the total number of page views.

Pages per Visit
: the total number of page views, counted across all site visitors, and then divided by the total number of visits within the specified date range.

Return Visitors
: the number of visitors to the specific digital domains who have visited previously within the indicated date range. These visitors are defined as return visitors due to a tracking ID previously seen in the data.

% of Return Visitors
: the percentage of the total number of return visitors.

Revenue
: the actual revenue captured from purchases. Supported formats for the reports are US dollars and euros. Your system administrator can customize the formula to calculate revenue. For example, your organization might choose to include or exclude tax and shipping costs as well as include values from other data sources.

% of Revenue
: the percentage of total revenue.

Views
: the total number of times that an indicated resource is accessed by a site visitor within the specified date range.

% of Views
: the percentage of the total number of views.

Visits
: the total number of times that the specific digital domain or domains have been accessed within the defined date range, with respect to any applied filters. If the same page or resource is viewed more than once in a given visit, then it is counted as a single visit with multiple views.

% of Visits
: the percentage of the total number of visits.

Using the Advertising and Campaigns Report

1. Click from the navigation bar.
2. Select the Advertising and Campaigns report.
3. Click the **Quick Facts** tab to display the most pertinent facts in your report, including counts of visitors and conversions, the most popular search engines, the search engines with highest number of conversions, the originations with the highest number of conversions, and the most popular landing pages.
4. Select a **Bounce Status** to display bouncing or non-bouncing visits.
5. Select a **Device Type** to display the device used to visit the website.
6. Select a **Visitor Type** to display new or returning visitors.
7. Click the **Daily**, **Weekly**, and **Monthly** tabs to display the data for the past 30 days, 12 weeks, or two years, respectively.
   - The pie chart displays the percentage of new and returning visitors.
   - In the line graph, select metrics from **Visits** and **Conversions** to compare.
   - In the bar chart, select the metric from **Visits** to display. Select one of these options to filter the data in the chart:
     - **Origination** provides information about the origin of the visit in the current session. The bar chart displays the total number of visits, stacked by the type of traffic source, based on date.
     - **Search Engines** displays information about visits that originated as a result of an external search, such as a search engine. A time series plot displays historical information about the number of site visits that are captured as visits, organic searches, and paid search visitors.

       Note: Some search engines withhold the search terms that are used. This limits the analysis of determining which search engines are being used. However, withholding search terms does not limit the analysis of which terms led customers to your site when they used non-paid search results.
     - **Landing Pages** provides information about the website pages that are available as a starting point for a visitor session. A time series chart displays a historical view of visits against page views, where the time line is controlled by the date slider.
   - In the table, select **Overall/Original**, **Search Engines**, or **Landing Pages** to filter information on the selected criteria. Expand the row name to display the components for that row. Drill down to display the numbers for each component. Components with lower numbers of conversions or visits are grouped in the **Lower Performers** category.

Business Processes Report

About the Business Process Report

The Business Processes report analyzes the success and abandonment rates of multi-step business processes.

Business processes differ from site to site. For example, a business process can be an application for insurance or a credit card, registration for an event, or a check-out process. Business processes usually involve a set of steps. Often these steps are sequential. The Business Processes report can help reveal which business processes are commonly accessed by web visitors and what the dropout rates are, per step, by business process.

This information can help you understand how to optimize the visitor interaction when using business processes. You can also better understand what information visitors are reticent to provide, which can help you determine how to raise completion rates.

Understanding the Business Processes Report

You can view the following metrics in the Business Process report:

Process Abandonment Rate
: the calculated rate at which a defined business process is started but not completed, compared with the number of visitors who begin the business process.

Process Completion Rate
: the calculated rate at which a defined business process is completed, compared with the number of visitors who begin the business process.

Processes
: the number of times the given business process has been started.

% of Processes
: the percentage of the total number of processes.

Processes Abandoned
: the calculated rate at which a defined business process is started but not completed, compared with the number of visitors who begin the business process.

Processes Completed
: the number of times the final step in a given business process has been reached and the business process is seen as complete or successful.

Step Abandonment Rate
: the calculated value that identifies the rate of abandoned process steps when compared with the number of visitors who initiated the process within a session.

Step Completion Rate
: the percentage of times a given step has been completed. This value is calculated as Steps Completed divided by number of Steps.

Steps
: the number of times the given step has been reached.

% of Steps
: the percentage of the total number of steps.

Steps Abandoned
: the number of times visitors did not proceed to the next step.

Steps Completed
: the number of times visitors progressed to the next step.

Using the Business Processes Report

1. Click from the navigation bar.
2. Select the Business Process report.
3. Click the **Quick Facts** tab to display the most pertinent facts in your report, including information about the processes and steps that are completed and abandoned.
4. Select a **Bounce Status** to display bouncing or non-bouncing visits.
5. Select a **Device Type** to display the device used to visit the website.
6. Select a **Visitor Type** to display new or returning visitors.
7. Click the **Daily**, **Weekly**, and **Monthly** tabs to display the data for the past 30 days, 12 weeks, or two years, respectively.
   - In the line graph, select metrics from **Processes** and **Processes Completed** to compare. Select one of the following options to filter the data in the graph:
     - **Overall** displays process metrics over time through a dual-axis line plot.
     - **Business Process Hierarchy** compares process metrics through a bar chart.
   - In the table, select **Processes** or **Steps** to filter information on the selected criteria. Expand the business process name. Drill down to display the numbers for each process and step. Business processes with lower numbers of processes or steps are grouped in the **Lower Performers** category.

Content Report

About the Content Report

The Content report analyzes the most-visited URLs, entry pages, and exit pages.

Knowledge about the type of digital media that is being accessed by website visitors might provide information that you can use to refine your website (including design and navigation). This information can help you understand which areas of your site are attracting, retaining, and ultimately converting visitors. You can also use this information to apply metrics to evaluate the value of the page for advertising purposes.

The report yields the following information:

- number of page views, unique visitors, and visits based on date
- ability to filter information by site section, domain, and page HREF
- pages that receive the greatest amount of activity
- specific website resources accessed
- areas of the website that are attracting the most visitors or longest lengths of stay

Understanding the Content Report

You can view the following metrics in the Content report:

Average Active Page View Time (seconds)
: the average number of seconds that visitors are actively using or viewing the page. This time excludes inactivity that is longer than the time-out value defined in SAS 360 Discover. The default value is 3 minutes.

Average Total Page View Time (seconds)
: the average length of time, in seconds, that a visitor viewed a single page.

Bounce Rate
: the percentage of site visitors who exit the site after viewing a single page or resource.

Entry Pages
: the number of times this page was the first page seen in a visit. This page is also called the landing page.

% of Entry Pages
: the percentage of the total number of entry pages.

Exit Pages
: the number of times this page was the last page seen in a visit.

% of Exit Pages
: the percentage of the total number of exit pages.

Views
: the total number of times that an indicated resource is accessed by a site visitor within the specified date range.

% of Views
: the percentage of the total number of views.

Visits
: the total number of times that the specific digital domain or domains have been accessed within the defined date range, with respect to any applied filters. If the same page or resource is viewed more than once in a given visit, then it is counted as a single visit with multiple views.

% of Visits
: the percentage of the total number of visits.

Using the Content Report

1. Click from the navigation bar.
2. Select the Content report.
3. Click the **Quick Facts** tab to display the most pertinent facts in your report, including information page counts, view counts, and domains.
4. Select a **Bounce Status** to display bouncing or non-bouncing visits.
5. Select a **Device Type** to display the device used to visit the website.
6. Select a **Visitor Type** to display new or returning visitors.
7. Select a **Domain**, **Site Section**, **Site Sub-Section**, and **Page HREF** to apply those filters to the data.
8. Click the **Daily**, **Weekly**, and **Monthly** tabs to display the data for the past 30 days, 12 weeks, or two years, respectively.
   - In the line graph, select metrics from **Views** and **Bounce Rate** to compare.
   - In the bar chart, filter the data by **Entry Pages** or **Exit Pages** to display the highest counts for those pages.
   - In the table, expand the row name to display the components for that row. Click a component name to display the numbers for that component.

Downloads Report

About the Downloads Report

The Downloads report analyzes content that has the highest download rate. Marketers can use the report to determine which site sections contain the most effective content.

Understanding the Downloads Report

You can view the following metrics in the Downloads report:

Document Downloads
: the total number of documents downloaded, in which the document type is defined by the system administrator.

% of Downloads
: the percentage of the total number of document downloads.

Using the Downloads Report

1 Click from the navigation bar.

2 Select the Downloads report.

3 Click the **Quick Facts** tab to display the most pertinent facts in your report, including information about the downloads that customers are accessing on your site.

4 Select a **Bounce Status** to display bouncing or non-bouncing visits.

5 Select a **Device Type** to display the device used to visit the website.

6 Select a **Visitor Type** to display new or returning visitors.

7 Select a **Site Section** and **Site Sub-Section** to apply those filters to the data.

8 Click the **Daily**, **Weekly**, and **Monthly** tabs to display the data for the past 30 days, 12 weeks, or two years, respectively.

- A line plot charts the volume of document downloads over time.
- A bar chart displays the volume of downloads for each site section.
- In the table, expand the row name to display the components for that row. Drill down to display the numbers for each component. Site sections with fewer downloads are grouped in the **Lower Performers** category.

Ecommerce Report

About the Ecommerce Report

The Ecommerce report analyzes product performance, purchases, and revenue over time. In this way, you can understand what product marketing techniques are working.

This information can help you design marketing awareness for online products based on factors such as the following:

- which products have higher purchase rates based on where the visitors came from
- where the product recommendation is located on the site

Understanding the Ecommerce Report

You can view the following metrics in the Ecommerce report:

Average Products per Abandonment Basket
: the calculation of the average number of different products or line items within an abandoned shopping cart. For example, a visitor purchasing multiple units of the same product counts as one product.

Average Products per Purchase
: the calculation of the average number of different products or line items within a purchase. For example, a visitor purchasing multiple units of the same product counts as one product.

Baskets Abandoned
: the total number of online shopping cart baskets in which a specific product or product group was added but the purchase was not completed or submitted for processing.

Basket Abandonment Rate
: the proportion of the total number of online shopping cart baskets that had at least one product added but not submitted for purchase, as compared with the total number of baskets completed.

Basket Adds
: the total number of individual products that are added to baskets regardless of how many units of each product are included.

% of Basket Adds
: the percentage of the total number of all product units that are added to baskets.

Basket Adds Revenue
: the total number of dollars for products added to baskets.

% of Basket Adds Revenue
: the percentage of the total amount of revenue for all products added to baskets.

Basket Adds Units
: the total number of product units added to baskets.

% of Basket Adds Units
: the percentage of the total number of all product units added to baskets.

Baskets Completed
: the total number of online shopping cart baskets that were populated and submitted as a purchase request.

Basket Completion Rate
: the proportion of the total number of online shopping cart baskets completed, as compared with the total number of baskets that were populated.

Baskets Started
: the total number of online shopping carts that visitors started with at least one product added to the basket.

Product Purchase Revenues
: the total amount of income, on a specific date, resulting from product purchases.

% of Product Purchase Revenues
: the percentage of the total amount of income resulting from product purchases.

Product Purchase Units
: the total number of product purchases completed for a specific item.

% of Product Purchase Units
: the percentage of the total number of product purchases.

Product Purchases
: the total number of products that were purchased on the indicated date.

% of Product Purchases
: the percentage of the total number of products.

Product Views
: the total number of product views that occurred on the indicated date.

% of Product Views
: the percentage of the total number of product views.

Using the Ecommerce Report

1 Click from the navigation bar.

2 Select the Ecommerce report.

3 Click the **Quick Facts** tab to display the most pertinent facts in your report, including information about product activity and interest.

4 Select a **Bounce Status** to display bouncing or non-bouncing visits.

5 Select a **Device Type** to display the device used to visit the website.

6 Select a **Visitor Type** to display new or returning visitors.

7 Click the **Daily**, **Weekly**, and **Monthly** tabs to display the data for the past 30 days, 12 weeks, or two years, respectively.

- In the line graph, select items from **Product Views** and **Product Purchases** to apply and compare metrics. Select one of the following options to filter the data in the graph:
  - **Overall** displays details about both metrics over time through a dual-axis line plot.
  - **Origination** displays a bar chart that applies the selected metrics to origination types.
  - **Products** displays a bar chart that applies the selected metrics to products.
- The bar chart displays the products with the highest purchases.
- In the table, select **Overall**, **Origination**, or **Products** to filter information on the selected criteria. Expand the row name to display the components for that row. Drill down to display the numbers for each component. Origination types or product groups with fewer product views or purchases are grouped in the **Lower Performers** category.

Forms Report

About the Forms Report

The Forms report uses the highest number of completed forms and highest number of abandoned forms to analyze user interaction with forms.

Forms can include site or event registration, user profile creation, password creation or changes, and so on. The report shows metrics related to visitors' interactions as they complete forms. The report also looks at the point in the process where visitors are abandoning the form.

This information can help you understand how to optimize the visitor interaction using forms. You can also better understand what information visitors are reticent to provide, which can help you determine how to raise completion rates.

Understanding the Forms Report

You can view the following metrics in the Forms report:

Form Abandonment Rate
: the percentage of times a given form has been initiated but not successfully submitted. This value is calculated as Forms Abandoned divided by Forms Started.

Form Completion Rate
: the percentage of times a given form has been initiated and successfully submitted. This value is calculated as Forms Completed divided by Forms Started.

Forms Abandoned
: the number of times visitors partially populated a given form and did not submit within a session.

Forms Completed
: the number of times a given form has been initiated, completed, and submitted within a session by visitors.

Forms Started
: the aggregate number of times a given form has been interacted with.

% of Started
: the percentage of the total of all started forms.

Using the Forms Report

1 Click from the navigation bar.

2 Select the Forms report.

3 Click the **Quick Facts** tab to display the most pertinent facts in your report, including information about completed and abandoned forms.

4 Select a **Bounce Status** to display bouncing or non-bouncing visits.

5 Select a **Device Type** to display the device used to visit the website.

6 Select a **Visitor Type** to display new or returning visitors.

7 Select a **Form Name** to display the information for that form.

8 Click the **Daily**, **Weekly**, and **Monthly** tabs to display the data for the past 30 days, 12 weeks, or two years, respectively.

- In the line graph, select metrics from **Forms Started** and **Forms Completed** to compare. Select one of the following options to filter the data in the graph:
  - **Overall** displays the number of started forms and the number of completed forms.
  - **Form Names** displays the started and completed forms for each form name.
- The report contains two bar charts. One bar chart display the forms with the highest abandonment rates. Another bar chart displays the last fields that were filled in for the highest number of abandoned forms.
- In the table, expand the row name to display the components for that row. Drill down to display the numbers of each component. Form names with lower numbers of forms completed or abandoned are grouped in the **Lower Performers** category.

Goals Report

About the Goals Report

The Goals report analyzes the highest-performing goals.

Understanding the Goals Report

You can view the following metrics in the Goals report:

Goals
: the number of goals, as defined by your site.

% of Goals
: the percentage of the total number of goals.

Revenue
: the actual revenue captured from purchases. Supported formats for the reports are US dollars and euros. Your system administrator can customize the formula to calculate revenue. For example, your organization might choose to include or exclude tax and shipping costs as well as include values from other data sources.

% of Revenue
: the percentage of total revenue.

Visits
: the total number of times that the specific digital domain or domains have been accessed within the defined date range, with respect to any applied filters. If the same page or resource is viewed more than once in a given visit, then it is counted as a single visit with multiple views.

% of Visits
: the percentage of the total number of visits.

Using the Goals Report

1. Click from the navigation bar.
2. Select the Goals report.
3. Click the **Quick Facts** tab to display the most pertinent facts in your report, including information about goals and revenue.
4. Select a **Bounce Status** to display bouncing or non-bouncing visits.
5. Select a **Device Type** to display the device used to visit the website.

6 Select a **Visitor Type** to display new or returning visitors.

7 Select a **Goal Group Name** or **Goal Name** to apply those filters to the data.

8 Click the **Daily**, **Weekly**, and **Monthly** tabs to display the data for the past 30 days, 12 weeks, or two years, respectively.

- In the line graph, select a metric from **Goals** to display. Select one of the following options to filter the data in the graph:
  - **Goals Over Time** tracks the goals reached over the specified date range.
  - **Goals Volume** displays the total volume of goals.
- In the table, expand the row name to display the goals for that row. Drill down to display the numbers for each goal. Goals with lower numbers of goals or visits are grouped in the **Lower Performers** category.
- The pie chart displays goals by origination type

Internal Searches Report

About the Internal Searches Report

The Internal Searches report analyzes the effectiveness of internal searches in locating information.

Understanding the Internal Searches Report

You can view the following metrics in the Internal Searches report:

Average Number of Additional Searches
: the average number of searches conducted by a visitor after an initial search is performed.

Average Number of Pages Viewed Afterward
: the average number of pages that a visitor views after completing an online search and following a linked result.

Exit Pages
: the number of times this page was the last page seen in a visit.

Exit Ratio
: the number of times that a visitor has exited directly from the search results page without clicking any of the provided results. This value is calculated as Exit Pages divided by Searches.

Failed Searches
: the number of searches that returned no search results.

Failure Rate
: the number of searches that returned no search results when compared with the number of searches that were conducted.

Results Returned
: the number of searches that produced search results.

Results Returned Rate
: the calculation of the rate of searches producing search results when compared with the total number of searches performed.

Searches
: the number of times that visitors initiated a search for the keyword indicated.

% of Searches
: the percentage of the total number of searches.

Visits
: the total number of times that the specific digital domain or domains have been accessed within the defined date range, with respect to any applied filters. If the same page or resource is viewed more than once in a given visit, then it is counted as a single visit with multiple views.

% of Visits
: the percentage of the total number of visits.

Using the Internal Searches Report

1. Click from the navigation bar.
2. Select the Internal Searches report.
3. Click the **Quick Facts** tab to display the most pertinent facts in your report, including information about search volume, search terms, and failed searches.
4. Select a **Bounce Status** to display bouncing or non-bouncing visits.
5. Select a **Device Type** to display the device used to visit the website.
6. Select a **Visitor Type** to display new or returning visitors.
7. Select a **Search Name** to apply that filter to the data.
8. Click the **Daily**, **Weekly**, and **Monthly** tabs to display the data for the past 30 days, 12 weeks, or two years, respectively.
   - In the line graph, select metrics from **Searches** and **Failed Searches** to compare.
   - One bar chart displays the search terms with the highest numbers.
   - In the Search Name bar chart, select an item from **Searches** to apply that metric.
   - In the table, select **Searches** or **Failed Searches** to filter information on the selected criteria.

Media Report

About the Media Report

The Media report uses the highest number of views or highest total viewing time to evaluate media content. Media mainly focuses on viewable content within the site architecture.

You can use the insights from this report to perform these tasks and analyses:

- cater media content that is of highest interest to site visitors
- understand what portions of any media are of most interest to visitors
- reveal outlier media that might be accessed often but is quickly terminated by visitors

Understanding the Media Report

You can view the following metrics in the Media report:

Average Content Viewed (seconds)
: the average length of media content that has been viewed.

Average Interactions per View
: the average number of media source interactions such as view, play, stop, and others.

Average Maximum Progress (seconds)
: the calculated average of the farthest point reached in a given media source.

Average Time Viewing (Seconds)
: the average length of time that the visitors spent viewing a specific media source.

Completion Rate
: the proportion of media sources that are viewed from beginning to end.

Views Started
: the total number of views initiated by visitors across all available media sources.

Visits
: the total number of times that the specific digital domain or domains have been accessed within the defined date range, with respect to any applied filters. If the same page or resource is viewed more than once in a given visit, then it is counted as a single visit with multiple views.

% of Visits
: the percentage of the total number of visits.

Using the Media Report

1. Click from the navigation bar.
2. Select the Media report.
3. Click the **Quick Facts** tab to display the most pertinent facts in your report, including information about the number of views and the average completion rate for media content on your site.
4. Select a **Bounce Status** to display bouncing or non-bouncing visits.
5. Select a **Device Type** to display the device used to visit the website.
6. Select a **Visitor Type** to display new or returning visitors.
7. Select a **Domain** and **Media Name** to apply those filters to the data.
8. Click the **Daily**, **Weekly**, and **Monthly** tabs to display the data for the past 30 days, 12 weeks, or two years, respectively.
    - The Media Viewing Time bubble plot displays the average time viewing and the average maximum progress. A tooltip for each bubble also lists the name for the media content.
    - The report contains two bar charts. One bar chart displays the percentage of media content viewed for the site. Another bar chart displays the highest number of sections viewed.
    - In the table, media names with fewer views or less viewing time are grouped in the **Lower Performers** category.

Promotions Report

About the Promotions Report

The Promotions report uses the highest number of displays or highest number of click-throughs to evaluate site-specific promotions.

Understanding the Promotions Report

You can view the following metrics in the Promotions report:

Click-Throughs
: the number of times that a specific promotion has been clicked (for example, a banner advertisement or advertising link) to reach the website resource.

Click-Through Rate
: the calculated rate determined for specific advertising targets. This rate represents the percentage for which targeted resources are clicked by visitors when compared with the number of times that the targeted resource is displayed.

Displays
: the number of times that a specific resource is presented. This information is also known as impressions.

Using the Promotions Report

1 Click from the navigation bar.

2 Select the Promotions report.

3 Click the **Quick Facts** tab to display the most pertinent facts in your report, including information about promotions, click-throughs, and displays.

4 Select a **Bounce Status** to display bouncing or non-bouncing visits.

5 Select a **Device Type** to display the device used to visit the website.

6 Select a **Visitor Type** to display new or returning visitors.

7 Select a **Promotion Type** and **Promotion Name** to apply those filters to the data.

8 Click the **Daily**, **Weekly**, and **Monthly** tabs to display the data for the past 30 days, 12 weeks, or two years, respectively.

- A line graph shows data on displays and click-throughs.
- In the Promotion Type bar chart, select metrics from **Promotion Name** and **Displays** to compare.
- Another bar chart shows the click-through rate.
- In the table, expand the row name to display the promotion types for that row. Drill down to display the numbers for each promotion type.

Visits Report

About the Visits Report

The Visits report analyzes the types of visits and tools that are used to access websites.

Understanding the Visits Report

You can view the following metrics in the Visits report:

Average Visit Duration (seconds)
: the average length of time, in seconds, that a visitor stayed on the site while viewing one or more pages.

Bounce Rate
: the percentage of site visitors who exit the site after viewing a single page or resource.

Conversion Rate
: the rate of conversion that occurs for an indicated resource within the date range specified. This value is calculated as Conversions divided by Visits.

Conversions
: the total number of visitors who have performed an administrator-defined task that results in conversion recognition. A conversion can be converting a visitor to a customer or any other administrator-defined behavior. By default, a conversion is the achievement of at least one defined goal during the visit.

Licensed Sessions
: the individual visitor sessions, in which a session can have multiple visits.

% of Licensed Sessions
: the percentage of the total number of licensed sessions.

New Visitors
: the number of first-time visitors to the specific digital domain or domains within the defined date range. A new visitor has an assigned ID (cookie or other identification) that has not been tracked by the data to date.

% of New Visitors
: the percentage of the total number of new visitors.

Page Views
: the aggregate number of times that any page is accessed, counted across all site visitors within the specified date range.

% of Page Views
: the percentage of the total number of page views.

Pages per Visit
: the total number of page views, counted across all site visitors, and then divided by the total number of visits within the specified date range.

Return Visitors
: the number of visitors to the specific digital domains who have visited previously within the indicated date range. These visitors are defined as return visitors due to a tracking ID previously seen in the data.

% of Return Visitors
: the percentage of the total number of return visitors.

Revenue
: the actual revenue captured from purchases. Supported formats for the reports are US dollars and euros. Your system administrator can customize the formula to calculate revenue. For example, your organization might choose to include or

exclude tax and shipping costs as well as include values from other data sources.

% of Revenue
: the percentage of total revenue.

Visits
: the total number of times that the specific digital domain or domains have been accessed within the defined date range, with respect to any applied filters. If the same page or resource is viewed more than once in a given visit, then it is counted as a single visit with multiple views.

% of Visits
: the percentage of the total number of visits.

Using the Visits Report

1. Click from the navigation bar.
2. Select the Visits report.
3. Click the **Quick Facts** tab to display the most pertinent facts in your report, including information about visitors, page views, conversions, browsers, devices, and cities.
4. Select a **Bounce Status** to display bouncing or non-bouncing visits.
5. Select a **Device Type** to display the device used to visit the website.
6. Select a **Visitor Type** to display new or returning visitors.
7. Click the **Daily**, **Weekly**, and **Monthly** tabs to display the data for the past 30 days, 12 weeks, or two years, respectively.
   - In the line graph, select metrics from **Revenue** and **% of Total Page Views** to compare.
   - The report has two pie charts. One displays visits by browser types and another displays visits by device types.
   - In the map, select a metric from **Visits** to view information grouped by location.
   - In the table, select **Overall**, **Browsers**, **Devices**, or **Location** to filter information on the selected criteria. Expand the row name to display the components for that row. Drill down to display the numbers of each component. Components with lower numbers of conversions or visits are grouped in the **Lower Performers** category.

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Real-Time Insights

About Real-Time Insights

To view predefined real-time reports, click from the navigation bar. Click a report name to open the report.

There following are the real-time reports:

- Real-Time Email Task Performance: Displays email task activity over the preceding 24 hours. For more information, see "Real-Time Email Task Performance Report" on page 793.
- Real-Time Mobile App Performance: Displays active, returning, and new users for unique mobile device ID. Results are displayed for the preceding 24 hours. For more information, see "Real-Time Mobile App Performance Report" on page 794.
- Real-Time Push Notification Task Performance: Displays information about push notifications that were sent and opened during the preceding 24 hours. For more information, see "Real-Time Push Notification Task Performance Report" on page 795.

Real-Time Email Task Performance Report

The Real-Time Email Task Performance report displays email task activity over the preceding 24 hours.

To view the report:

1 Click from the navigation bar.

2 Select the Real-Time Email Task Performance report.

3 Click to select an email task. By default, the report displays information for the last task that was selected.

4 The counts in the **Attempted**, **Hard Bounces**, **Opens**, and **Clicks** tiles are automatically updated every five seconds.

5 Select **Attempted**, **Hard Bounces**, **Opens**, or **Clicks** as a measure. The measure is applied to the line in the graph.

6 Click **Minute** or **Hour** to apply a unit of time to the graph.

7 Move the slider below the graph to view the counts for a specific time period.

Real-Time Mobile App Performance Report

The Real-Time Mobile App Performance report displays the number of active, returning, and new users over the preceding 24 hours. The users are counted by unique device ID.

To view the report:

1 Click from the navigation bar.

2 Select the Real-Time Mobile App Performance report.

3 Click to select a mobile application. By default, the report displays information for the last application that was selected.

4 The counts in the **All Active Users**, **Returning Users**, and **New Users** tiles are automatically updated every five seconds.

5 Select **User count** or **Sessions**. The measure is applied to all of the lines in the graph.

6 Click **Filter** and select the lines to add to the graph. The default is **All Active Users**. Select an individual line, or select **User Type**, **Device Type**, or **App Version** to add all of the lines in that category.

7 Click **Minute** or **Hour** to apply a unit of time to the graph.

8 Move the sliders below the graph to view the counts for a specific time period.

Real-Time Push Notification Task Performance Report

The Real-Time Push Notification Task Performance report displays information about push notifications that were sent and opened during the preceding 24 hours.

To view the report:

1. Click from the navigation bar.
2. Select the Real-Time Push Notification Task Performance report.
3. Click to select a mobile push notification task. By default, the report displays information for the last task that was selected.
4. The counts in the **Sent** and **Opens** tiles are automatically updated every five seconds.
5. Select **Sent** or **Opens** as a measure. The measure is applied to the line in the graph.
6. Click **Minute** or **Hour** to apply a unit of time to the graph.
7. Move the slider below the graph to view the counts for a specific time period.

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Email Summary Report

About the Email Summary Report

The Email Summary report displays information about attempted email messages for every email task. Use this report to understand if a campaign is performing as expected, and to evaluate the performance of each email task.

To view the report:

1 Click from the navigation bar.

2 Select the Email Summary report.

3 Select one or more email tasks. If you do not select a task, the data is summarized for all tasks.

4 Select a **Month**, **Weekday**, or **Date** from the menus at the top of the report to filter the information by time period for each section. If you do not select a filter, the data is summarized for all time periods. The data is summarized each hour.

5 Click on the **Attempted**, **User Actions**, **Performance**, or **Performance Rates** tabs to view sections of the report.

- The **Attempted** tab displays information about the performance of your email campaign based on the volume of attempted messages and hard bounces for the selected tasks.
  - The **Attempted** total is the number of messages that are passed from SAS to the mail transfer agent. The mail transfer agent analyzes the sender information for each email message before attempting delivery.
  - The **Hard Bounce** total is the number of messages that the mail transfer agent indicates are undeliverable because the email addresses are invalid.
  - Select **Hour**, **Weekday**, **Month**, or **Date** at the bottom of the report to display the information for that unit of time.
- The **User Actions** tab tracks the actions that the recipients of the email campaign are taking based on the number of clicks, opens, and views for the selected tasks.
  - The **Clicks** total is the number of times a tracked link is clicked by an email recipient. A tracked link is a hyperlink in an email message. Clicks

on unsubscribe links and clicks on links to view the web version of the email content in a browser are not included in the **Clicks** total.

- The **Opens** total is the number of messages that have been opened by recipients.
- The **Views** total is the number of times recipients view the web version of the email content in a browser.
- Select **Hour**, **Weekday**, **Month**, or **Date** at the bottom of the report to display the information for that unit of time.

- The **Performance** tab displays the number of attempted email messages that have been opened, attempted, clicked, and viewed for the selected tasks.
- The **Performance Rates** tab displays the total click-to-open rate for the selected tasks. Performance rates track the effectiveness of an email message and whether it has generated enough interest for recipients to click a link to learn more about the content.

PART 17

Integrating with Other Systems

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About Integrating with SAS Customer Intelligence 360

How Integration Occurs

The external API gateway for SAS Customer Intelligence 360 enables external solutions to access operations and events that occur in SAS Customer Intelligence 360. This access usually occurs through the SAS Customer Intelligence 360 on-premises access point.

- The access point asynchronously processes the data that is sent between SAS Customer Intelligence 360 and your site. Access point performance is not affected by transmission speeds between your site and the cloud.
- The access point enables SAS applications to exchange data with SAS Customer Intelligence 360. The access point bridges the gap between SAS Customer Intelligence 360 and previous releases of SAS Customer Intelligence. You can synchronize your digital data collection on premises, use your own data sources, and run your own analyses before you interact with SAS Customer Intelligence 360 in the cloud.

Integration Features

The external gateway API and access point enable features such as streaming SAS Customer Intelligence 360 events to the on-premises access point, injecting a stream of external events from an on-premises process into SAS Customer Intelligence 360 (bulk events), injecting individual events into SAS Customer Intelligence 360, and staging offers from an on-premises process (for example, SAS Customer Intelligence 6.*x* solutions).

For example, within SAS Customer Intelligence 360, you can make events available to SAS Real-Time Decision Manager campaigns. You can use the next best action capabilities of SAS Real-Time Decision Manager (such as real-time scoring, business rules, and arbitration) to detect a significant event regarding a customer, determine the best offer to deliver based on the customer's current context, and prepare for delivery of the offer in a subsequent interaction. You can then stage digital offers (for example, a private billing system or personal history) back into SAS Customer Intelligence 360. The selection of the best offer would be based on personally identifiable information. The set of offers could be further curated on premises using your organization's proprietary models.

Note: To ensure successful integration with SAS Customer Intelligence 6.*x* solutions, make sure that you are using TLS 1.2 as the communication protocol. Install all available hot fixes, and then add the following JVM argument to the SASServer6 and SASServer7 processes:

```
-Dhttps.protocols=TLSv1.1,TLSv1.2
```

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Setting Up the External API Gateway

About the External API Gateway

Endpoints

The external API gateway has these endpoints:

Web-socket endpoint into the gateway that is used by the on-premises access point:`/agent/stream`
: This web-socket endpoint is used to stream events from SAS Customer Intelligence 360 to an on-premises agent. It is also used to exchange data between the agent and SAS Customer Intelligence 360 for other features of the application. The web socket is bidirectional for data, but not for events.

Admin REST API: `/marketingGateway/commons/ping`
: This endpoint is standard across the SAS Customer Intelligence 360 service nodes. It provides data about the health of the node and is used to determine whether the service is active.

Health Summary REST API: `/marketingGateway/commons/healthcheck`
: This endpoint responds with a summary of the health of the SAS Customer Intelligence 360 external API gateway.

Node Metrics REST API: **/marketingGateway/commons/metrics**
This endpoint provides node metrics for the SAS Customer Intelligence 360 external API gateway

Bulk Events REST API: **/marketingGateway/bulkEventsFileLocation**
This endpoint is used to request a signed URL to which the access point can upload a file containing events that are processed by SAS Customer Intelligence 360.

Access Point Configuration REST API: **/marketingGateway/configuration**
This endpoint is used to retrieve the access point configuration data for the SAS Customer Intelligence 360 on-premises access point from SAS Customer Intelligence 360.

Customer Jobs REST API: **/marketingGateway/customerJobs**
This endpoint is used to trigger jobs that are related to customer data from SAS Customer Intelligence 360. For more information, see “Exporting Customer Identity Data”.

SAS 360 Discover Download API: **/marketingGateway/discoverService/dataDownload**
This REST endpoint is used to download SAS 360 Discover data. For more information, see “Downloading Data from SAS Customer Intelligence 360” on page 870.

Event Jobs REST API: **/marketingGateway/eventJobs**
This endpoint is used to trigger jobs that are related to event data from SAS Customer Intelligence 360. For more information, see “Exporting Customer Event Data”.

External Events REST API: **/marketingGateway/events**
This endpoint is used so that an on-premises process can inject "external" events into SAS Customer Intelligence 360. These events can then be used to trigger tasks and activities in SAS Customer Intelligence 360.

Staging REST API: **/marketingGateway/stagedOffers**
This endpoint is used to stage treatments and creatives into SAS Customer Intelligence 360 from an on-premises application.

Connecting Securely to the External API Gateway Node

Communications between access points and the external API gateway are based on HTTPS token authentication through a JSON Web Token (JWT). JWTs are self-contained objects that enable two parties to transmit data securely between them. JWTs are defined by the RFC 7519 standard. They are digitally signed and can be independently verified. This token must be specified as the HTTP Authorization header when an access point or REST client makes HTTPS calls or web-socket requests to the external API gateway. The HTTPS calls and web-socket requests can be made through a proxy server.

The JWT is generated from these two parts:

tenant ID
an ID that is assigned to you when your SAS Customer Intelligence 360 environment is configured. To find your tenant ID, navigate to General

Settings on the navigation bar and select **Site Configuration** ⇨ **SAS Tag Instructions**. Find your tenant ID in the code sample.

client secret
: a string that is generated randomly for an external access point. External access points and access point credentials help manage the processing of data between SAS Customer Intelligence 360 and other solutions that access your data. Create external access points in the user interface by navigating to **General Settings** on the navigation bar and select **External** ⇨ **Access**. For more information, see "External Access".

For REST calls and other access points to connect to the external API gateway, the JWT must be included in the HTTP Authorization header as `<type> <credentials>`, where *type* is `Bearer` and *credentials* is the JWT string. For example, the Authorization header of a REST call might look like this example:

```
Bearer eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.ey...J9.3WIGMwJ_7z_HAavu5-oqgQCZNIp1aqj
```

For more information, see "Generate the JWT".

CAUTION! Limit how often requests are made to the external API gateway. The external API gateway is configured to limit the number of requests from a single IP address to 45,000 requests per five minutes (150 requests per second). The limit includes all REST requests to the API gateway. An HTTP 403 (Forbidden) code is returned if a request is made after the limit has been exceeded for the trailing five minutes.

Media Types for the External API Gateway

Link Types for the Media Types

The following table lists and describes the link types used by the media types.

Table 61.1 *Link Types*

Name	Type	Description
method	string	The HTTP method for the link.
href	string	The URL for the link.
uri	string	The relative URI for the link.
itemType	string	If this is a link to a container, itemType is the media type or link type for the items in the container.
responseItemType	string	The media type or link type of the items in the response body for a PUT, POST, or PATCH operation.
title	string	The title for the link.

Name	Type	Description
rel	string	The relationship of the link to the resource.
type	string	The media type or link type for the link.
responseType	string	The media type or link type of the response body for a PUT, POST, or PATCH operation.

application/vnd.sas.api

This type contains the top-level links that are available from the root of the API. Responses from a GET request at the root of the API return content in this media type. This GET operation requires authorization. The application/vnd.sas.api type is a JSON object (or XML document) that contains a links array of Atom link objects.

Here is an example of the JSON representation of this media type:


```
{
  "version": 1,
  "links": [
    {
      "method": "GET",
      "rel": "self",
      "href": "/marketingGateway",
      "uri": "/marketingGateway",
      "type": "application/vnd.sas.collection"
    },
    {
      "method": "POST",
      "rel": "createFileLocation",
      "href": "/marketingGateway/bulkEventsFileLocation",
      "uri": "/marketingGateway/bulkEventsFileLocation",
      "type": "application/vnd.sas.marketing.decision.events.file.reference"
    },
    {
      "method": "POST",
      "rel": "createEvent",
      "href": "/marketingGateway/events",
      "uri": "/marketingGateway/events",
      "type": "application/vnd.sas.marketing.decision.external.event"
    },
    {
      "method": "GET",
      "rel": "configuration",
      "href": "/marketingGateway/configuration",
      "uri": "/marketingGateway/configuration",
      "type": "application/vnd.sas.marketing.decision.configuration"
    },
    {
      "method": "POST",
```

```
      "rel": "createStagedOffer",
      "href": "/marketingGateway/stagedOffers",
      "uri": "/marketingGateway/stagedOffers",
      "type": "application/vnd.sas.marketing.decision.staged.offer"
    }
  ]
}
```

The application/vnd.sas.api type contains these representation members.

Table 61.2 Representation Members

Name	Type	Description
version	integer	The version number of the API representation. This representation is version 1.
links	collection of link objects	One or more link objects. For more information, see “Link Types for the Media Types”.

application/vnd.sas.error

This type denotes an error response from a REST API. This response payload is typically returned for 4xx-level or 5xx-level errors to indicate the occurrence of a client error or a server error.

Here is an example of application/vnd.sas.error+json:

```
{
  "id": "optionalErrorIdentifierString",
  "errorCode": integer-error-code,
  "httpStatusCode": integer-HTTP-status code,
  "details": [
     "Additional text to describe the error",
     "There may be 0 or more detail strings"
  ],
  "errors": [ <array-of-nested-error-objects> ]
  "links": [],
  "message": "error message",
  "remediation": "possible ways to remediate this error (such as list missing fields, fields out of rang
     etc.)",
  "version": 2
}
```

The application/vnd.sas.error external media type uses these representation members.

Table 61.3 Representation Members

Name	Type	Description
ID	string	A string that identifies the error condition.

Name	Type	Description
errorCode	integer	The system error code for reference (32-bit integer), often used for correlation with back-end service error message identifiers; `0` indicates an unspecified error, or that the error ID field describes the error.
httpStatusCode	integer	The HTTP status code error number (integer) - 1xx, 2xx, 3xx, 4xx, or 5xx values.
message	string	The back-end system error message string. The message must be localized as required by the Accept-Language of the request.
details	string array	Detailed information specific to this error displayed in an array of strings. If appropriate, these strings must be localized as required by the Accept-Language of the request. If the error is caused by some other service, details includes the error code or error ID of that error in the details array, with a prefix of `cause:` .
errors	object array	(Optional) An array of nested (root cause) error objects.
remediation	string	(Optional) Recommended actions to resolve the error displayed in a list of strings. The remediation string must be localized as required by the Accept-Language of the request.
version	integer	Version information for this error format (value 2).
links	array of link objects	Zero or more links to related resources or operations.

application/vnd.sas.marketing.decision.events.file.reference +json

This type is used to obtain a signed S3 URL in order to upload a bulk events file. Here is an example of the JSON representation of this media type:

```
{
  "version":1,
  "applicationId":"eventGenerator",
}
```

The application/vnd.sas.marketing.decision.events.file.reference+json media type contains these representation members.

Table 61.4 *Representation Members*

Name	Type	Description
applicationId	string	The name of the application that uploads the file
version	integer (int32)	(Optional) Specifies the version of this media type

application/ vnd.sas.marketing.decision.events.file.reference.response +json

This type returns a response when you successfully obtain a signed S3 URL in order to upload a bulk events file. Here is an example of the JSON representation of this media type:

```
{
  "version":1,
  "links": [{
    "method": "PUT",
    "rel": "self",
    "href": "https://<server>/transfers/mcg/2017032915/MAExternalOPDMaster/abc/bbaabcfb29e79eb0a051d1a1c
             -Amz-Security-Token=<Amazon security token>&X-Amz-Algorithm=<algorithm>&X-Amz-Date=20171017
             X-Amz-SignedHeaders=content-type%3Bhost&X-Amz-Expires=899&X-Amz-Credential=<security creden
             <signature>",
    "uri": null,
    "type": "application/octet-stream"
  }],
  "creationTimeStamp": "2017-09-28T19:09:23.341Z",
  "expiresTimeStamp": "2017-09-28T19:24:23.341Z"
}
```

The application/vnd.sas.marketing.decision.events.file.reference+json media type contains these representation members.

Table 61.5 Representation Members

Name	Type	Description
creationTimeStamp	date (date-time)	The formatted timestamp that shows when the signed URL was created, in yyyy-MM-ddTHH:mm:ss.SSSZ format
expiresTimeStamp	date (date-time)	The formatted timestamp that shows when the signed URL expires, in yyyy-MM-ddTHH:mm:ss.SSSZ format
url	string	The signed URL for the user to upload the bulk event
version	integer	(Optional) Specifies the version of this media type

application/vnd.sas.marketing.decision.external.event+json

This type publishes a JSON-defined external event to the tag server. Here is an example of the JSON representation of this media type:

```
{
  "eventName":"externalEvent1",
  "subject_id":"267756",
  "Price":100,
  "Month":"January"
}
```

The application/vnd.sas.marketing.decision.external.event+json media type contains these representation members.

Table 61.6 Representation Members

Name	Type	Description
externalEvent	string	The attributes for the external event
version	integer (int32)	(Optional) Specifies The version of the media type

application/vnd.sas.marketing.decision.external.event.response+json

This type returns a response when you successfully publish a JSON-defined external event to the tag server. Here is an example of the JSON representation of this media type:

```
{
```

```
    "version":1,
    "userMessage":"Event posted to tag server."
}
```

The application/vnd.sas.marketing.decision.external.event.response+json media type contains these representation members.

Table 61.7 Representation Members

Name	Type	Description
userMessage	string	The message that is returned to the end user
version	integer (int32)	(Optional) Specifies The version of the media type

application/vnd.sas.marketing.decision.staged.offer+json

This type sends a staged offer to an application. Here is an example of the JSON representation of this media type:

```
{
    "version":1,
    "subjectId":"129975",
    "treatments": [ {"id" : "trmt1,"contactCode" : "CC1","responseCode" : "RC1"}
]
}
```

The application/vnd.sas.marketing.decision.staged.offer+json media type contains these representation members.

Table 61.8 Representation Members

Name	Type	Description
subjectId	string	TheThe subject ID (that is, the ID of the subject of interest, customer, household, and so on)
version	integer (int32)	(Optional) Specifies the version of the media type

Error Codes

For errors that are generated explicitly by the external API gateway service, a standard SAS error is returned by the application/vnd.sas.error media type. The following table lists and describes the error codes that are returned in the service.

Table 61.9 Error Codes

Error Code	HTTP Response Code	Description
74215	500	Tenant on-board utility property not found.
74216	500	Could not get Ticket Granting Ticket from the logon URL.
74217	500	Error opening the connection to the platform.
74219	500	Did not get a successful response code from the platform.
74220	500	Could not get ST from the platform ticket service.
74221	500	Error calling the data hub identity REST service.
74223	400	Missing identity value from the posted JSON. For example, the subjectID is missing.
74224	400	JWT does not verify with the supplied client secret.
74225	500	Unable to obtain the client secret from the Design Center.
74226	500	Received message packet for a session that has not been initialized or has been removed.
74227	400	JSON parse exception—bad JSON.
74235	400	Not enough fields were submitted.
74237	500	Platform service key is missing.
74238	500	Design service URL key is missing.
74239	500	Design service key is missing.
74240	500	Data hub identity service URL key is missing.

Error Code	HTTP Response Code	Description
74241	500	Tag server base URL key is missing.
74242	500	Event filter service key is missing.
74243	500	Tenant service user name key is missing.
74244	500	Tenant service password key is missing.
74248	500	Tenant name is missing.
74250	500	Tenant service URL is missing.
74251	500	Tenant service is not reachable.
74252	500	Configuration service is not reachable.
74253	500	Error reading the upload file.
74254	500	Data hub discover service URL key is missing.
74255	400	Missing the application ID.
74256	400	Invalid identity value.
74259 Server error	500	General error.

Setting Up the External API Gateway

Whitelist Domains

To communicate with SAS Customer Intelligence 360, you must whitelist specific domains in your firewall depending on the action that you want to perform. The following table lists the domains that need to be whitelisted.

CAUTION! Limit how often requests are made to the external API gateway. The external API gateway is configured to limit the number of requests from a single IP address to 45,000 requests per five minutes (150 requests per second). The limit includes all REST requests to the API gateway. An HTTP 403 (Forbidden) code is returned if a request is made after the limit has been exceeded for the trailing five minutes.

Table 61.10 Domains to Whitelist

Action	Domains to Whitelist
Access the SAS Customer Intelligence 360 user interface	Europe: https://platform-euw.ci360.sas.com https://design-euw.ci360.sas.com US: https://platform-use.ci360.sas.com https://design-use.ci360.sas.com
Discover download	Europe: https://extapigwservice-eu-prod.ci360.sas.com https://ci-360-deployment-prod-eu-west-1.s3-eu-west-1.amazonaws.com https://ci-360-datahub-data-prod-eu-west-1.s3.amazonaws.com US: https://extapigwservice-prod.ci360.sas.com https://ci-360-deployment-prod-us-east-1.s3.amazonaws.com https://ci-360-datahub-data-prod-us-east-1.s3.amazonaws.com
Connect the on-premises access point	Europe: https://extapigwservice-eu-prod.ci360.sas.com US: https://extapigwservice-prod.ci360.sas.com
Upload bulk events	Europe: https://extapigwservice-eu-prod.ci360.sas.com https://ci-360-datahub-transfers-prod-eu-west-1.s3.amazonaws.com US: https://ci-360-datahub-transfers-prod-us-east-1.s3.amazonaws.com https://extapigwservice-prod.ci360.sas.com
Export data (contact and responses) and upload data (customer, opt out, and so on), including uploading lists from SAS Customer Intelligence 6.x	Europe: https://design-euw.ci360.sas.com https://ci-360-datahub-transfers-prod-eu-west-1.s3.amazonaws.com US: https://design-use.ci360.sas.com https://ci-360-datahub-transfers-prod-us-east-1.s3.amazonaws.com

Create an Access Point Definition

1 Sign in to SAS Customer Intelligence 360.

2 Select **General Settings** and then select **External** ⇨ **Access**.

3 Click .

4 Click **Access Point Credentials** and then enter a staging name in the **Name** field.

Note: The name must match the configuration for the on-premises access point.

The **ID** is automatically generated by the system.

5 To add access point credentials (that is, a key for the access point), click **Add**.

Note: Remember the tenant ID and the client secret because they are used when you configure the on-premises access point for the various use cases.

6 To activate the access point, select **Active**. By default, the status of the access point is **Inactive**.

Note: You must add access point credentials before you can change the status of the access point to Active.

7 To identify the events that you want SAS Customer Intelligence 360 to send to the access point, click **Associations**, and then complete these actions:

a Select **Select events**.

b Click .

c Select the check box in the row for the event that you want to add. To add all events in the table, select the check box in the top row of the event table.

d Click **OK**.

8 Click **Associations**, select the identity type that you configured in "Set Up Customer Identities for Access Points" on page 817 and then click .

Note: If you are going to use the external API gateway to stage events from an external application to SAS Customer Intelligence 360, you must select only the associated ID for the identity type that is being sent in the REST request. An incorrect ID is returned if you select additional associated IDs.

9 In the **Create New Credentials** dialog box, click **OK** to accept the system-generated **Tenant ID** and **Client secret**.

10 If necessary, you can replace or remove the system-generated client secret. To replace the client secret, click **Replace**, and then click **OK** in the **Create New Credentials** dialog box. To remove the client secret, click **Remove**, and then click **Yes** in the confirmation dialog box.

Note: If you generate a new client secret, you must also generate a new JWT. To change the client secret, edit the access point defined in the interface and click **Replace** in the Credentials section.

11 Click **Done**. The access point appears in the table on the **Access** page.

Generate the JWT

Access to the external API gateway is controlled by a JWT that is generated from the tenant ID and a string that is used as a client secret. JWTs are self-contained objects that enable two parties to transmit data securely between them. JWTs are defined by the RFC 7519 standard. They are digitally signed and can be independently verified.

Here are two methods that you can use to generate a JWT:

- an online tool such as JSON Web Token by Stormpath
- a local installation of Python and the pyjwt package

To generate a JWT with a local Python installation:

1 Install version 3.x or later of Python (external link).

2 Use the pip command in Python to install the pyjwt package. For example:

```
c:\>c:\Python27\Scripts\pip.exe install pyjwt
Collecting pyjwt
  Using cached PyJWT-1.5.2-py2.py3-none-any.whl
Installing collected packages: pyjwt
Successfully installed pyjwt-1.5.2
```

3 Start Python, and use the interactive Python console to generate a JWT. For example:

```
c:\>c:\Python27\python.exe
Python 2.7.13 (v2.7.13:a06454b1afa1, Dec 17 2016, 20:42:59)
[MSC v.1500 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> import jwt
>>> import base64
>>> tenant_id = "<tenant ID>"
>>> client_secret = "<client secret>"
>>> client_secret_bytes = bytearray(client_secret, 'ascii')
>>> token = jwt.encode({'clientID': "<tenant ID>"}, base64.b64encode (client_secret_bytes),a
>>> print(token)
>>> quit()
```

The print() function of this script displays the value for the JWT in the console window.

For REST calls and other access points to connect to the external API gateway, the JWT must be included in the HTTP Authorization header as ***<type> <credentials>***, where *type* is **Bearer** and *credentials* is the JWT string. For example, the Authorization header of a REST call might look like this example:

```
Bearer eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.ey...J9.3WIGMwJ_7z_HAavu5-oqgQCZNIp1aqj
```

Add a Website to the List of Allowed Domains

Complete these steps in SAS Customer Intelligence 360:

1 From the navigation bar, click **General Settings** and select **Site Configuration** ⇨ **Domains**.

2 Click and complete the fields on the **Domain** page.

On the **Domain** page, complete these actions:

- activate or deactivate data collection.
- specify a default path for elements in that domain.
- create rules to exclude data collection from certain elements. You can use keywords or regular expressions in this field.

Here is an example of values that you can use to define a domain:

Table 61.11 Domain Definition

Name	Value
Domain	www.mysite.com Note: Do not include a protocol (for example, http://), path (for example, mysite.com/some_path), or port number (for example, www.mysite.com:7556) in the **Domain** field.
Default URL	https://www.mysite.com/ homepage#lnk=gnavweeklyad
Data Collection Status	Active

Here is an example of an exclusion rule that you can define that excludes any "admin" pages from being tracked:

Table 61.12 Exclusion Rule for a Domain

Name	Value
URL path	**Contains** `admin`

3 (Optional) Set the domain as the default in the **Approved Domains** list. When you set a domain as the default, that domain is used to automatically populate the domain fields for configuration rules for other data collection settings.

Set Up Customer Identities for Access Points

Note: Before you can set up customer identities, a SAS Customer Intelligence 360 stack must be created with a tenant on-boarded and configured. A website must also be configured to interact with SAS Customer Intelligence 360.

In order for customer-related information and events that are sent and received from the external API gateway to be used with SAS Customer Intelligence 360, you must map the identity of the customer used by the external API gateway plug-ins, the identity used for that customer on the website, and the identity (for example, datahub_id) used internally by SAS Customer Intelligence 360 for that customer. To set up the identity service in SAS Customer Intelligence 360:

1 Create a comma-separated values (CSV) file containing the following identities that are associated with each user:

   - the identity used on the website (for example, the user's login ID)
   - the identity used in the incoming external events (for example, subject_id)

     Note: This identity might be the same as the identity used on the website.

   Here are examples of customer identities that have a login ID, subject ID, and email address:

   - jSmith,1000,John.Smith@anydomain.com
   - mDupree,2020,Marcel.Dupree@anydomain.com
   - rRodriguez,3121,Robert.Rodriguez@anydomain.com
   - gWu,114431,Gloria.Wu@anydomain.com

2 Create a data descriptor to upload the identity data. For example, the sample customer identities from the previous step could be imported with the following data descriptor:

```
{
  "name": "customers for access point",
  "description": "Sample import descriptor for an access point",
  "type": "customer",
  "dataItems": [
    {
      "name": "login",
      "label": "login",
      "description": "Login ID",
      "type": "STRING",
      "tags": [],
      "excludeFromAnalytics": true,
      "identityType": "login_id",
      "identity": true,
      "segmentation": true,
      "key": true
    },
    {
      "name": "subject ID",
      "label": "subject ID",
      "description": "Subject ID",
      "type": "STRING",
      "identity": false,
      "excludeFromAnalytics": true,
      "segmentation": true
    },
    {
      "name": "email",
      "label": "email",
      "description": "Email address",
      "type": "STRING",
      "tags": [
```

```
            "DEMOGRAPHICS",
            "EMAIL_CONTACT"
          ],
          "excludeFromAnalytics": true,
          "identity": false,
          "segmentation": true,
          "channelContactInformation": true
        }
      ]
    }
```

For more details about this step, see "Creating an Import Descriptor" on page 185.

3 Upload the import descriptor.

a Open a text editor and create a basic template for your descriptor. You can use text similar to this example:

```
{
  "name": "",
  "description": "",
  "type": "",
  "dataItems": [
    {
      "name": "",
      "label": "",
      "description": "",
      "type": "",
      "tags": []
    },
    {
      "name": "",
      "label": "",
      "description": "",
      "type": "",
      "tags": []
    }
  ]
}
```

b Define the top-level attributes. For more information, see "Import Descriptor Attributes".

c Define a data item for each column of your input data. For more information, see "Data Item Attributes".

d (Optional) Modify attributes to use merge tags with imported data. Merge tags enable you to personalize messages and creatives for specific members of the audience. You can use merge tags to dynamically retrieve personalized information about your recipient (such as his or her first name). This information can then be used to customize the content of a task.

To make your imported data available to merge tags, set these properties in the data descriptor:

i Add the EMAIL_CONTACT field tag to a data item that contains email addresses.

ii Set the channelContactInformation attribute to `true` for the data item.

TIP If you have data that could be used for merge tags but are unsure, add the channelContactInformation property just in case you do decide to use the data later.

e (Optional) Modify attributes for segmentation. Set these attributes to control how SAS Customer Intelligence 360 uses your data in segment discovery, segment creation, and targeting:

i Set the type attribute for the data descriptor object (the top-level element) to **`customer`**.

ii For best results, set these values for each dataItems property in the data descriptor:

Table 61.13 Property Settings for Segmentation

Property	Recommended Value	Description
segmentation	true	Enables an item to be used as criteria when you define a segment in the UI.
excludeFromAnalytics	false	If the value is **`true`**, then analytics cannot view the property. So, the user record cannot be part of a discovered segment criteria or segment profiles. Segment profiling still runs using that criteria to define the segment and the population, but that record is not part of the resulting analysis.
segmentProfilingField	true	Enables the system to use this record for segment profiling.

To illustrate how these settings interoperate and affect your data, assume that you have dataItems properties for "gender" configured as follows:

- `"segmentation": true`
- `"excludeFromAnalytics": true`

If you use the condition "gender=F" to define a segment, then analytics uses that criteria to split the data in half (in the segment and in the population). However, gender is not profiled by analytics and gender does not appear in any discovered segments. If the segmentation property is set to **`false`**, then analytics does not process it regardless of the value of the excludeFromAnalytics property.

This granular design enables you to explicitly define segments that were discovered by analytics in a task. If the segmentation property is set to **`false`**, then you cannot define that segment. This means that analytics is discovering segments that you cannot use for future targeting.

f Upload the import descriptor. Use this REST call:

```
POST https://design-<server>/SASWebMarketingMid/rest/descriptors/
```

In the body of the REST call, paste the JSON code for the import descriptor.

Follow these guidelines when you submit a REST call:

- When you include JSON data in the body, set the Content-Type header value to **application/json**. How you set this value depends on the REST client.
- You must be authenticated with SAS Customer Intelligence 360. In most cases you can submit authentication information through your REST client.

If you receive an OK (response code 200) as a response, the upload was successful. If you need to update a descriptor, see "Update an Import Descriptor".

For details about this step, see "Creating an Import Descriptor".

4 To upload the customer data, complete these steps in SAS Customer Intelligence 360:

a Select **General Settings** ⇨ **Data Sources**.

The descriptor that you created in Step 2 appears in the table.

b Click .

c Click **Customer**.

d Select the descriptor that you created in Step 2.

e Click **Browse** and navigate to the CSV file that you created in Step 1.

f Click **Upload Data**.

The internal identity used by SAS Customer Intelligence 360 (datahub_id) is automatically created by this process.

Note: It might take up to an hour before the identities are available.

Configure How Website Users Are Mapped to Customer Identities

Complete these steps in SAS Customer Intelligence 360:

1 From the navigation bar, click **General Settings** and select **Classification** ⇨ **User Identities**.

2 Click

3 Select the event type.

- Select **Click** if you want to monitor a page element when it is clicked. The page element that a user clicks is known as the click target.

- Select **Form Submit** if you want to specify form elements on a page to monitor.
- Select **Page View** when you want to specify a specific page or pages that match a pattern that you define.

Note: The **Advanced Event** option is no longer available. Existing advanced events still generate data for SAS 360 Discover, but they cannot be used in other licenses of SAS Customer Intelligence 360.

4 Select the page on your site to watch for this event.

CAUTION! Define only one identity event for a page on a site. When more than one identity event exists for the same page on a site, there is no way to ensure which event is triggered. Also, be sure your site's pages follow the guidelines for preparing your site on page 15.

- For a click event, navigate to the page that contains the click target. From the navigation bar, change the radio button to **Select** (from **Navigate**).

  Select the click target to highlight it. You can change this element later on the **Target Location** tab.

- For a form submit event, navigate to the page that contains the form. From the navigation bar, change the radio button to **Select** (from **Navigate**).

  Select the form element to highlight it. You can change this page or form element later on the **Form Location** tab.

- For page view events, select the page that you want to monitor.

  Note: You can change this page or page view event later on the **Page Location** tab.

5 Click **Create Definition**.

6 Select the identification type. The identification type is the category that best fits the user ID that you are capturing. All identity types are bridged together in the system to create unique customer profiles.

Select one of these types:

Login
: a login ID that represents a customer. For example, this value could be the user name that the customer uses for your site. Customer profiles can be associated with more than one login ID.

  Note: For SAS 360 Discover, you must define the user identity as a login type to ensure it is written to the SESSION_FACT.LAST_USER_ID table and automatically used as the primary key for the ECV process.

Customer ID
: a unique ID for a customer on your site. For example, this value could be the customer's account number. Typically, a customer has only one customer ID, but customers can be associated with multiple customer identities.

7 Refine which pages to include in the event on the **Event Configuration** tab.

a For form submit events, refine the elements that are used to identify the form in the **Form Identification** section.

b In the **Pages Containing Form** or **Pages in Event** section (depending on your event type), specify the pages to monitor for this event.

- To use only the page that you selected originally, select **Only page where selector was chosen** or **Selected page** (depending on your event type).
- Select **Pages matching attribute pattern** to define rules that determine which pages to include.
- Select **Any page** to include all pages.

8 Complete the fields on the **User ID Attribute** tab.

a Define how to capture the identification data.

- For form submit events, click for the **Field Name, ID** field and select the form field to use.

  For the **Return** field, select the appropriate value from the menu. You might need to complete additional information based on the option that you choose.

- For click events and page view events, select an element that contains the information that you need.

  For the **Return value from** field, select a value based on the type of element:

  - For attributes, select the name of the attribute.
  - For field values, select **value**.
  - For the content of a node, select **innerHTML** or **innerText**, depending on the node type.
  - If you use a JavaScript object, you must specify *object.property* in the **Variable name** field. You cannot specify only the object.

b For the **Obscured** option, select **Yes** or **No**. This option specifies whether values are obscured before they are saved.

CAUTION! For best results, do not modify this setting after identities are created. If you change the obfuscation value after identities are created, the existing identities can be adversely impacted in the back-end database.

9 (Optional) Define an event to confirm a user's ID.

a Set the time period in which the user ID must be confirmed. The time can be in seconds or minutes. The default is one minute.

b Specify the page attributes that identify the confirmation event.

For example, assume that the body tag contains the text "isLoggedIn" for logged-in users. In the **Page Attributes** section, enter this text in the **Page element** field: `body:contains(isLoggedIn)`

Download an Access Point SDK

To download a ZIP file that is associated with an access point:

1 Sign in to SAS Customer Intelligence 360.

2 Select **General Settings** and then select **External** ⇨ **Access**.

3 Open a general access point or direct access point.

4 Click **Download Framework**.

5 If you opened a general access point, click **Download General Framework**. If you opened a direct access point, click **Download Direct Framework**.

6 Extract the ZIP file to a local directory.

To configure a general access point, manually copy and paste the tenant ID and client secret to the /config/event-streaming-configuration.properties file located in the folder where the access point is installed and included in the downloaded SDK ZIP file. For more information about configuring an on-premises access point, see "Contents of the General Access Point SDK" on page 61. Be sure to delete "#" in the lines that contain the tenant ID and client secret.

For information about configuring a direct access point, see the CI360DirectAgentSetup.docx file in the ZIP file that you downloaded.

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Streaming Events

Stream Events from SAS Customer Intelligence 360

Overview

The external API gateway allows for the streaming of events from SAS Customer Intelligence 360 to an on-premises access point. These events can be click events on a website or derived events that are defined in SAS Customer Intelligence 360.

For an example of this feature that uses SAS Event Stream Processing, see “Injecting SAS Event Stream Processing Events” on page 853.

Processing Enriched Events

Enriched events are events that come from the customer website and derived events that are defined in SAS Customer Intelligence 360. If you configure two access points in SAS Customer Intelligence 360, then each access point sees all the enriched events (that are not filtered using the filtering feature) for that tenant. However, if multiple access points connect using the same tenant ID and client secret (that is, connecting to a single access point configuration in SAS Customer Intelligence 360), then the events are split between the access points, where each event goes to only one of the access points. If one of the access points goes down, the API gateway automatically starts routing those events to one of the other access points. If a new access point then comes up, some of the traffic destined for one of the running access points is routed to the new access point.

Inject Events into SAS Customer Intelligence 360

The on-premises API gateway enables the user to generate events on premises and have them processed in SAS Customer Intelligence 360 similar to events from other channels (for example, web and mobile).

Note: If the event contains an identity (other than datahub_id) that is not recognized by SAS Customer Intelligence 360, the external API gateway requests SAS Customer Intelligence 360 to create a new ID for that identity. If "datahub_id" is passed in the event as the identity and the datahub_id is not recognized by SAS Customer Intelligence 360, the API call to SAS Customer Intelligence 360 fails. For more information, see “Identity Types” on page 169.

External events that are posted to the SAS Customer Intelligence 360 access point must be in JSON format. Here are examples:

```
{
  "eventName":"an event name",
  "datahub_id":"cfde9fed-cab4-4c1e-a72d-8f55c2afe9d7"
}
```

```
{
  "eventName":"an event name",
  "customer_id":"4f7da1259869376249211123"
}
```

The JSON objects contain these attributes:

Table 62.1 JSON Attributes for External Events

Name	Description
datahub_id	(Optional) Specifies the ID for the data hub for the event. Note: The datahub_id is not required if the customer_id, login_id, or subject_id is specified in the **Associated IDs** setting for the access point.
eventName	The event name as defined in the user interface.

Name	Description
<other_id>	A value for another identity type. The name of this attribute depends on the customer data that is loaded. Depending on the values set in the **Associated IDs** setting for the access point in the SAS Customer Intelligence 360 user interface, the attribute name might be “subject_id”, “login_id”, or “customer_id”. For more information, see “External Access” on page 53. The ID is used by the external API gateway to look up the data hub ID using the identity service . Sometimes the identity of a customer in SAS Customer Intelligence 360 is different from the identity of that customer in on-premises processes. The SAS Customer Intelligence 360 event streaming interface enables you to map the SAS Customer Intelligence 360 identity to a secondary identity. To map the identity: ■ the secondary identity has to be known to the identity service for SAS Customer Intelligence 360. ■ the Associated IDs for the access point definition must be configured to select which identities are mapped for the agent. This mapping enables the external API gateway to add the secondary identity to any SAS Customer Intelligence 360 events that are forwarded to the access point. If you update the access point definition after an access point is already connected, any identity mapping change is applied to any future events. Events already in the pipeline are not affected by the identity mapping change.

Send events as a POST request to http://localhost:8080/events. The body should be set to the application/json type and contain the JSON code that defines an event. The access point receives the event by calling a REST endpoint on the API gateway node.

Note: Events can be injected directly into the external API gateway, instead of going through the access point.

The access point adds the necessary JWT to the header and any other required information from its configuration. The SAS Customer Intelligence 360 external API gateway then processes the JSON and forwards it to the SAS Customer Intelligence 360 Tag Server, where it is processed and published to SAS Event Stream Processing. Depending on the event filters, the event might be received by the access point, but with JSON attributes that are added during processing.

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Integrating with Content Management Systems

You can integrate SAS Customer Intelligence 360 with a third-party Content Management System (CMS). You can select assets from a third-party CMS and add them as creatives in SAS Customer Intelligence 360. You must first ensure that you have set up the on-premises access point. For more information, see "External Access" on page 53.

Working with the Configuration File

In the **doc** folder of the Access Point SDK, there is a cms_configuration.json file with five attributes:

```
[{
  "id":"local_cms",
  "name":"Sample Content Management System",
  "className":"com.sas.mkt.apigw.sdk.streaming.agent.listener.thirdparty.LocalCmsProcesso
  "supportSearch":true,
  "supportFolders":false
}]
```

1 Modify the JSON code as necessary for your site. Use these guidelines:

- If you have multiple systems, use a separate object (the attribute sets enclosed in the {} characters) to define each system. Give each system a unique name and ID.
- Setting the supportSearch attribute to **true** enables you to search your CMS from within SAS Customer Intelligence 360.
- Setting the supportFolders attribute to **true** enables you to view the folder structure of your CMS from within SAS Customer Intelligence 360.

Here is some example code:

```
[{
  "id":"aem",
  "name":"AEM Content Management System",
  "className":"com.sas.mkt.apigw.sdk.streaming.agent.listener.thirdparty.AEMCmsProc
```

```
    "supportSearch":false,
    "supportFolders":true
  }]
```

2 After you modify the code, save and move the file to the **config** folder of the Access Point SDK.

3 Restart the Access Point SDK. The access point uploads the CMS to SAS Customer Intelligence 360 and your content is available.

Working with the Local CMS Processor File

If you want to use your own CMS, you have to get your data from your CMS to the system, and then convert the data to a SAS format. The following localcmsprocessor.java file is included in the **doc** folder of the Access Point SDK. You can use the file as a template to create your own file.

```
package com.sas.mkt.apigw.sdk.streaming.agent.listener.thirdparty;

import java.io.BufferedReader;
import java.io.IOException;
import java.io.InputStreamReader;
import java.net.HttpURLConnection;
import java.net.MalformedURLException;
import java.net.URL;

import org.slf4j.Logger;
import org.slf4j.LoggerFactory;

import com.sas.mkt.apigw.sdk.streaming.agent.cms.CMSInterface;

/**
 * @author ranune
 */
public class LocalCmsProcessor implements CMSInterface {
   private final static Logger logger =
      LoggerFactory.getLogger(LocalCmsProcessor.class);

   public LocalCmsProcessor () {
      // blank constructor
   }

   @Override
   public String getDataFromCMS(String path, String queryParam) {
      String cmsJson = null;
      String urlValue = "http://localhost:8083/content/media";

      if(path != null) {
         urlValue +="&path="+path;
      }
      if(queryParam != null) {
```

```
            urlValue +="&q="+queryParam;
        }
        try {
            URL url = new URL(urlValue);
            HttpURLConnection urlc = (HttpURLConnection) url.openConnection();
            urlc.setDoOutput(true);
            urlc.setRequestMethod("GET");
            urlc.setAllowUserInteraction(false);

            StringBuffer sb = new StringBuffer();
            BufferedReader br =
                new BufferedReader(new InputStreamReader(urlc.getInputStream()));
            String l = null;
            while ((l=br.readLine())!=null) {
                sb.append(l);
            }
            br.close();
            cmsJson = sb.toString();
        } catch (MalformedURLException e) {
            // Auto-generated catch block
            e.printStackTrace();
        } catch (IOException e) {
             // Auto-generated catch block
             e.printStackTrace();
        }
        return cmsJson;
      }

    @Override
    public String convertDataToSAS360(String json) {
        return json;
    }
}
```

Here is an example SAS format file:

```
id: null,
path: null,
name: "bear",
lastModifiedDate: null,
action: null,
originalURL: "<data data-context-url="http://myHost.com:8181/mycms/
  content/bear.html"></data>",
width: 440,
height: 400,
size: 0,
type: null,
thumbnailURL: "http://myHost.com:8181/mycms/images/thumbnail/bear.jpg",
previewURL: "http://myHost.com:8181/mycms/images/preview/bear.jpg",
folder: false
```

Compile the file and add it to the JAR file in the **`libThirdParty`** folder in the Access Point SDK.

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Integration Use Cases

Triggering a Campaign from a SAS Customer Intelligence 360 Event

Objective

SAS Customer Intelligence 360 can use the actions of a user in a digital channel to send an event to SAS Real-Time Decision Manager. SAS Real-Time Decision Manager can then be used to create a next best offer for the user.

Prerequisites

To trigger a SAS Real-Time Decision Manager campaign from an event in SAS Customer Intelligence 360:

- Have access to SAS Customer Intelligence 360, and complete the steps for onboarding and environment configuration.
- Install and license SAS Real-Time Decision Manager on a local system.
- Complete the steps in “Setting Up the External API Gateway” on page 813. These steps include setting up the customer identity, creating an access point definition, and downloading the access point SDK to an on-premises system.

  Note: You must know the identity type that will be used by the external API gateway and access point, the name of the access point definition, and the tenant ID and client secret assigned to the access point definition.

Step 1. Create an Access Point That Sends Information to SAS Real-Time Decision Manager

1 Click .

   a Select **New General Access Point** from the drop-down list.

2 Click **Access Point Credentials**.

3 Enter unique information in the **Name** field.

The **ID** is automatically generated by the system.

4 To add general access point credentials (that is, a key for the access point), click **Add**.

5 To activate the general access point, select **Active**. By default, the status of the general access point is **Inactive**.

Note: You must add general access point credentials before you can change the status of the access point to Active.

6 In the **Request New Credentials** dialog box, click **OK** to accept the system-generated **Tenant ID** and **Client secret**.

7 If necessary, replace or remove the credentials. To replace the client secret, click **Replace**, and then click **OK** in the **Request New Credentials** dialog box. To remove the system-generated tenant ID and client secret, click **Remove**, and then click **Yes** in the confirmation dialog box.

8 To identify the events that you want SAS Customer Intelligence 360 to send to the general access point, click **Associations**, select **Select events**, and then complete these actions:

   a Click .

   b Select the check box in the row for the event that you want to add. To add all items in the table, select the check box in the top row of the event table.

   To search for an event, enter information in the search box in the **Select Event** window.

   c Click **OK**.

9 To identify the data views that you want SAS Customer Intelligence 360 to send to the general access point, click **Associations**, select **Select data views**, and then complete these actions:

   a Click .

   b Select the check box in the row for the data view that you want to add. To add all items in the table, select the check box in the top row of the data view table.

   To search for a data view, enter information in the search box in the **Select Data View** window.

   c Click **OK**.

10 To specify the IDs that become mapped to the internal ID for outgoing and incoming events:

   a Click **Associations**.

   b Select **Associated IDs**.

   c Select one or more items in the **Available items** panel, and then click . To select all available items, click . To undo your selection, click .

The values for these IDs are inserted into events sent from SAS Customer Intelligence 360 to the on-premises access point (outgoing events) and into events sent from the on-premises access point to SAS Customer Intelligence 360 (incoming events).

11 Email send agents must be associated with an on-premises access point in order for the email send agent to send generated opt-out events to the on-premises access point for processing. For more information, see “Email Settings” on page 44.

Note: If any of the email send agents are associated with an external access point, then that external access point also receives all hard-bounce events for that tenant.

To associate an email send agent with the access point, click **Email**, select **Select send agents**, and then complete these actions:

a Click .

b Select the check box in the row for the send agent that you want to add. To add all send agents in the table, select the check box in the top row of the send agent table.

c Click **OK**.

12 To associate a third-party content management system (CMS) with the general access point, click **Content Management**, and then complete these steps:

a Select the **Enable content management** check box. Only a single general access point for a tenant is allowed to have CMS integration enabled.

b Enter appropriate information into the **Name** field.

c Enter the name of the class defined in your JAR file into the **Class** field.

d (Optional) Select the **Allow search** check box if your CMS is enabled to allow searches.

e (Optional) Select the **Allow folders** check box if your CMS includes folders.

13 To map SAS Event Stream Processing windows either inbound to or outbound from SAS Customer Intelligence 360 external events, click **SAS Event Stream Processing**, and complete these actions:

a Select the **Enable events from or to SAS Event Stream Processing** check box.

b Enter the location of the SAS Event Stream Processing application in the **SAS Event Stream Processing URL** field.

c Click either the **Inbound Events** or **Outbound Events** tab.

d Click the **Add Event Maps** button.

e Enter the names of SAS Event Stream Processing windows that are being mapped into (inbound) or out from (outbound) SAS Customer Intelligence 360 external events in the **Event Stream Processing window** field.

f In the **Trigger event** field, click and select external events that are being mapped into (inbound) or out from (outbound) SAS Customer Intelligence 360.

Note: For inbound events, the **Event Stream Processing window** field appears first, followed by the **Trigger event** field to signify that the mapping goes in the direction of SAS Customer Intelligence 360. For outbound events, these fields appear in reverse to signify that the mapping is out from SAS Customer Intelligence 360.

g In the **Attributes** field, enter SAS Event Stream Processing window variables and SAS Customer Intelligence 360 event attributes in this format: `window variable name, event attribute` for inbound mappings and `event attribute, window variable name` for outbound mappings. You can enter multiple pairs of window variables and event attributes that are separated by a new line.

h To map additional SAS Event Stream Processing windows to SAS Customer Intelligence 360 events, click .

i To remove an event map, click in the panel for the map.

14 To map SAS Customer Intelligence 360 events to SAS Real-Time Decision Manager events, click **SAS Real-Time Decision Manager**, and then complete these actions:

a Select the **Enable streaming events to SAS Real-Time Decision Manager** check box.

b Enter the location of the SAS Real-Time Decision Manager application in the **SAS Real-Time Decision Manager URL** field.

c Click and then select a SAS Customer Intelligence 360 trigger event. The occurrence of this event generates an offer from SAS Real-Time Decision Manager.

d In the **Real-Time Decision Manager event** field, enter the SAS Real-Time Decision Manager event that you want to map to a SAS Customer Intelligence 360 event.

e (Optional) Click and select an external event in SAS Customer Intelligence 360 to use as a response event.

f In the **Attributes** field, enter SAS Customer Intelligence 360 event attributes and SAS Real-Time Decision Manager event attributes in this format: `SAS Customer Intelligence 360 event attribute, SAS Real-Time Decision Manager event attribute`. You can enter multiple pairs of event attributes that are separated by a new line.

g To map additional SAS Customer Intelligence 360 events to SAS Real-Time Decision Manager events, click .

h To remove an event map, click in the panel for the map.

15 To download the general access point SDK, click **Download Framework**, and then click **Download General Framework** to download the ZIP file to a directory on your local system. Provide the file and login credentials to users who need access to interact with SAS Customer Intelligence 360.

To configure the general access point, manually copy and paste the tenant ID and client secret to the /config/event-streaming-configuration.properties file located in the folder where the access point is installed and included in the downloaded SDK ZIP file. For more information about configuring the general access point, see “Contents of the General Access Point SDK” on page 61. Be sure to delete “#” in the lines that contain the tenant ID and client secret.

16 Click **Done**. The general access point appears in the table on the **Access** page.

Step 2. Download the Access Point SDK to the System where SAS Real-Time Decision Manager is Running

To download the general access point SDK, click **Download Framework**, and then click **Download General Framework** to download the ZIP file to a directory on your local system. Provide the file and login credentials to users who need access to interact with SAS Customer Intelligence 360.

Step 3. Create a Click Event Definition in SAS Customer Intelligence 360

To configure an event to be generated when the customer clicks a spot on the website:

1 Sign in to SAS Customer Intelligence 360.

2 Click **Events**.

3 Click and select **Click**.

4 Navigate to the page that contains the spot which, when clicked, will generate the event that executes the SAS Real-Time Decision campaign.

5 Select the click target and click **Select Parent** to refine the selector. Click **Create Event**.

Note: You can change or validate the selector anytime from the **Target Location** tab.

6 Click .

7 Enter a name for the event (for example, *Ad100ClickedEvent*).

Note: The event name must match the name that is configured for the On-Premises access point. (For instructions, see "Step 4. Associate the Event with the Access Point" on page 840.)

8 Make your event available to other items by clicking **Orchestration** and selecting **Mark Ready**. This action changes the status of your event from Designing to Ready.

Click **Publish** to move the event from a Ready status to an Active status. Events with an Active status cannot be changed back to Designing. An event with an Active status does not prevent an item that contains the event from publishing.

Step 4. Associate the Event with the Access Point

In order for the event that was created in "Step 1. Create a Click Event Definition in SAS Customer Intelligence 360" on page 859 to be forwarded by the on-premises access point, associated events must be configured for the definition for the SAS Customer Intelligence 360 access point.

To configure the associated events for the access point definition:

1 Sign in to SAS Customer Intelligence 360.

2 Navigate to 🔧 and then select **External** ⇨ **Access**.

3 Open the access point that was created in "Create an Access Point Definition" on page 815.

4 Click **Associations**, and then complete these actions:

   a Select **Select events.**

   b Click .

   c Select the check box in the row for the event that you created in "Step 3. Create a Click Event Definition in SAS Customer Intelligence 360" on page 839.

   d Click **OK**.

5 Click **Done**.

Note: You can also associate a new event with the access point by selecting **External Availability** on the **Orchestration** tab and then selecting the access point you created in "Step 1. Create an Access Point That Sends Information to SAS Real-Time Decision Manager" on page 835.

TIP When you create an event, you can define some event attributes that you might need to use in SAS Real-Time Decision Manager on the **Event Details** tab. The access point that you associate with the event sends those attributes to SAS Real-Time Decision Manager.

Step 5. Configure the On-Premises Access Point SDK for Triggering a SAS Real-Time Decision Manager Campaign from a SAS Customer Intelligence 360 Event

In order for on-premises processes to interact with SAS Customer Intelligence 360, an on-premises access point must be downloaded from SAS Customer Intelligence 360 and configured. For information about downloading the on-premises access point, see "External Access" on page 53. Information about setting up the access point is included in the On Premises Agent Installation Guide.docx file in the downloaded mkt_extapigw.sdk.zip file. To configure the on-premises access point to trigger a SAS Real-Time Decision Manager Campaign from a SAS Customer Intelligence 360 event, edit these files in the unzipped SDK:

1 Open the config/agent-endpoints.properties file and modify the event.streaming.endPointNodeName property:

```
event.streaming.endPointNodeName=extapigwservice-<server name>:443
```

Set the server name based on your region:

- For USE, set the server name to this value: **`prod.ci360.sas.com`**
- For EUW, set the server name to this value: **`eu-prod.ci360.sas.com`**

2 Point the event.streaming.rtdmEndpoint property to the URL for the load-balanced engine (for example, event.streaming.rtdmEndpoint=http://RTDMEndpoint:*Port*/RTDM/rest/runtime/decisions).

3 Open the config/event-streaming-configuration.properties file and modify these properties:

```
event.streaming.tenantID=<tenantID from the "Create an access point definition" ste
  in the common document >
event.streaming.clientSecret=<clientID from the "Create an access point definition"
  step in the common document>

# Set all unused properties to false.
```

4 Create the customerIntelligence-to-rtdm-event-mappings.json file to map the SAS Customer Intelligence 360 event to a SAS Real-Time Decision Manager event. Use JSON code similar to the following example:

Note: You cannot use spaces in the name for `rtdmEvent`.

```
{
  "rtdmStream": [
    {
      "eventName": "name of CI360 Event created above",
      "rtdmEvent": "name of RTDM Event created above",
      "rtdmEventMetadata": {
          "name of RTDM request variable": "type of RTDM request variable",
          "name of RTDM another request variable": "type of another
             RTDM request variable"
      },
      "rtdmEventMappings": {
          "CI360 event variable": " name of RTDM request variable ",
          "another CI360 event variable": " name of another RTDM
            request variable"
     }
        }
  ]
}
```

5 (Optional) To make sure that you can view events so that you can verify that the integration is working correctly, open the logback-spring.xml file and modify these properties:

Note: These edits will add a lot of information to the log and the console.

```
# set the level to TRACE
```

```
    <logger name="com.sas" level="TRACE">
    </logger>
    # set the level to WARN
    <logger name="org.springframework" level="WARN">
    </logger>
    # set the level to WARN
    <logger name="org.apache" level="WARN">
    </logger>
    # set the level to TRACE
    <root level="TRACE">
    # remove "<!--" and "-->" in the next line
      <!--  <appender-ref ref="CONSOLE" /> -->
      <appender-ref ref="SAS_FILE" />
    </root>
  </configuration>
```

Step 6. Create a SAS Real-Time Decision Manager Campaign to Be Executed When the SAS Customer Intelligence 360 Event Occurs

1. Sign in to SAS Real-Time Decision Manager and create an event definition.

   Note: The name and request variables for the event are used when sending the REST request into the engine to run the campaign. Usually, one of the request variables contains the identity of the customer triggering the event “subject_id” so that the SAS Real-Time Decision Manager campaign can look up customer data when determining the output of the campaign. The “subject_id” is also used during the process of staging to SAS Customer Intelligence 360 to map the SAS Customer Intelligence 6.**x** identity to the data hub ID in SAS Customer Intelligence 360.

2. Create the SAS Real-Time Decision Manager campaign using the event that was created in “Step 3. Create a Click Event Definition in SAS Customer Intelligence 360” on page 839.

   Note: You might want to use existing customer data to create a branch.

3. Assign a treatment to the Stage node for each of the branches.

4. In the Stage node, ensure that the “Subject” is set correctly and that the value for the Subject is set to the request variable containing the “subject_id”.

5. Mark the SAS Real-Time Decision Manager campaign for deployment.

6. Deploy and activate the campaign in the Decision Services engine.

Step 7. Start the Access Point

1. Verify that the Java (1.8 or later) executable is in your PATH or that the JAVA_HOME environment variable is set.

2 Enter the following command:

```
* cd <SDK path>/bin
```

3 To start the access point, run the UNIX script or the Windows script that is in the bin folder. The access point prompt (>) appears in the user interface.

   To stop the access point, enter **`agent stop`** at the command prompt and press Enter.

   As the access point runs, it listens to port 8080 (by default) for REST requests with external events.

   Note: If multiple access points are running, all of the access points must be assigned unique ports. For more information, see the On Premise Agent Installation Guide.docx file that is included in the downloaded mkt_extapigw-sdk.zip file.

Step 8. Generate the Web Event

To generate the event that triggers the execution of the SAS Real-Time Decision Manager campaign:

1 From the website, navigate to the page where the customer signs in and sign the customer in.

2 Navigate to the page with the spot where the click event was configured.

3 Click the spot.

Step 9. Verify That the SAS Real-Time Decision Manager Campaign Was Executed

1 Sign in to SAS Real-Time Decision Manager.

2 Open the SAS Real-Time Decision Manager campaign that was created in "Step 6. Create a SAS Real-Time Decision Manager Campaign to Be Executed When the SAS Customer Intelligence 360 Event Occurs" on page 842.

3 In each node on the diagram page, note the number of times the campaign has been run in the Decision Services engine. Each time the SAS Customer Intelligence 360 event is fired, the count for the Start node is incremented.

Staging a SAS Real-Time Decision Manager Treatment to SAS Customer Intelligence 360

Objective

After an event is sent from SAS Customer Intelligence 360 to SAS Real-Time Decision Manager, you can use SAS Real-Time Decision Manager to calculate a next best offer for the user and to send a staged offer to the user.

Prerequisites

To stage a SAS Real-Time Decision Manager treatment to SAS Customer Intelligence 360:

- Complete the steps in “Setting Up the External API Gateway” on page 813, including setting up the customer identity, creating an access point definition, and downloading the access point SDK to an on-premises system.

  Note: You must know the name of the access point definition and the tenant ID and client secret assigned to the access point definition.

- Install and configure SAS Real-Time Decision Manager 6.5.

Step 1. Configure SAS Real-Time Decision Manager to Stage Treatments to SAS Customer Intelligence 360

To configure an existing SAS Real-Time Decision Manager Decision Services engine to stage treatments to SAS Customer Intelligence 360:

Note: These instructions are also included in stage/README_install.txt in the downloaded SDK.

1 Copy the JAR files from the `<access point SDK root>/stage/lib` folder into the `<SAS installation directory>/Web/WebAppServer/SASServer7/sas_webapps/sas.decisionservices.engine.war/WEB-INF/lib` directory.

2 Copy the stage/ci360staging.properties file from the SDK into the `<SAS installation directory>/Web/WebAppServer/SASServer7/conf` directory.

3 Make changes to these properties in the ci360staging.properties file:

```
apiURL=https://extapigwservice-<server>/marketingGateway/stagedOffers

  clientID=<tenantID for the access point>

clientSecret=<clientID for the access point>
```

Set the server name based on your region:

- For USE, set the server name to this value: `prod.ci360.sas.com`
- For EUW, set the server name to this value: `eu-prod.ci360.sas.com`

4 Restart SASServer7 by completing the following steps:

   a In Windows, search for `services`.

   b In the **Services (Local)** panel, right-click the service name for SASServer7 and click **Restart**.

5 Sign in to SAS Management Console for the SAS installation.

6 On the **Folders** tab, navigate to `System/Applications/SAS Decision Services/Decision Services 6.4/SASDSEngineRepository`.

7 Right-click the SASDSEngineRepository folder and then click **Import SAS Package**.

8 Click **Browse** and navigate to the CI360StagingAssetsXXX.spk file.

   Note: The assets are imported for the release of SAS Real-Time Decision Manager at your site.

9 Click **OK**.

10 Click **Next** three times.

11 Click **Finish**.

12 Click the **Plug-ins** tab.

13 Expand **Decision Services Manager** and the **SAS Decision Services servers** folder.

14 Expand the folder for the engine that contains the imported assets.

15 Click **Decision Flows**.

16 In the right-hand pane, right-click _SAS_ADD_STAGED_TREATMENTS_CI360_FLOW and select **Activate**.

Treatments that are staged by flows in this engine are now sent to SAS Customer Intelligence 360.

Step 2. Create SAS Real-Time Decision Manager Treatments to Stage to SAS Customer Intelligence 360

1 Sign in to SAS Real-Time Decision Manager.

2 In the **Designer** workspace, click the **Treatments** tab.

3 Create two treatments. For more information, see *SAS Real-Time Decision Manager: User’s Guide*.

Note: The treatment name is used when creating creatives in SAS Customer Intelligence 360 that are associated with these treatments.

Step 3. Create a SAS Real-Time Decision Manager Campaign to Be Executed When the SAS Customer Intelligence 360 Event Occurs

1 Sign in to SAS Real-Time Decision Manager and create an event definition.

Note: The name and request variables for the event are used when sending the REST request into the engine to run the campaign. Usually, one of the request variables contains the identity of the customer triggering the event “subject_id” so that the SAS Real-Time Decision Manager campaign can search customer data when determining the output of the campaign. The “subject_id” is also used during staging to SAS Customer Intelligence 360 to map the SAS Customer Intelligence 6.**x** identity to the data hub ID in SAS Customer Intelligence 360.

2 Create the SAS Real-Time Decision Manager campaign using the event that you created in the previous step.

Note: You might want to use existing customer data to create a branch.

3 Assign a treatment to the Stage node for each of the branches.

4 In the Stage node, ensure that the “Subject” is set correctly and that the value for the Subject is set to request the variable that contains the “subject_id”.

5 Mark the SAS Real-Time Decision Manager campaign for deployment.

6 Deploy and activate the campaign in the Decision Services engine.

Step 4. Upload SAS Real-Time Decision Manager Treatments to SAS Customer Intelligence 360

1 Sign in to the mid-tier server for the SAS Real-Time Decision Manager installation.

2 Navigate to **<*SASHome*>\SASCustomerIntelligenceUtilities\6.5**.

3 Run the following command:

```
sasciutils -uploadTreatments -userid <CI 6.x user ID> -password <CI 6.x password>
-bcname <CI 6.x Business context name> -debug -ci360userid <tenant user ID>
-ci360password <tenant password> -ci360serverurl https://design-<server>
/SASWebMarketingMid/rest/ -ci360logonurl https://platform-
```

```
<server>/SASLogon/v1/tickets/ > c:\temp\uploadLog.txt
```

Set the server name based on your region:

- For USE, set the server name to this value: `prod.ci360.sas.com`
- For EUW, set the server name to this value: `eu-prod.ci360.sas.com`

Step 5. Import the Uploaded Treatments as Creatives in SAS Customer Intelligence 360

1. Sign in to SAS Customer Intelligence 360.
2. Click **Creatives**.
3. Click ⋮ and select **Import Creatives**.
4. Select a treatment that you uploaded in “Step 4. Upload SAS Real-Time Decision Manager Treatments to SAS Customer Intelligence 360” on page 846.

   Note: An imported offer cannot be used as a creative if the offer has already been imported as a message. Delete the existing message and re-import the treatment offer.
5. (Optional) Select **Edit Properties** and modify the message name and description.
6. Click **Import**.

   Note: Custom details that are supported by SAS Customer Intelligence 360 are mapped to the properties for the creative. For more information about custom details for treatments, see *SAS Real-Time Decision Manager: User’s Guide*.
7. Click so that the imported creative appears in the Creatives table.
8. Double-click the imported creative.
9. Click **Edit**.
10. Click and enter the location of the image in the **URL** field and the text for the image in the **Alternative Text** field.
11. Click **OK**.
12. Click **Done**.
13. Click .
14. Navigate to the **Orchestration** tab and select **Mark Ready**.
15. To promote the creative from a Ready status to an Active status, click **Publish**.
16. Repeat steps 2–15 for each treatment that you want to import as a creative.

Step 6. Create a Spot to Display Treatments That Were Imported as Creatives

To define the spot on the website that displays a treatment that was imported as a creative:

1. Sign in to SAS Customer Intelligence 360.
2. Click **Spots**.
3. Click .
4. Click **Web Spot**. The website of the spot's location is displayed.
5. Navigate to the page that contains the spot.
6. Click **Select**, and then click the spot.
7. Click **Create Spot**.
8. Click .
9. Enter information in the **Name** field and click **Save**.
10. Navigate to the **Orchestration** tab and select **Mark Ready**.
11. To promote the spot from a Ready status to an Active status, click **Publish**.

Step 7. Create a Task to Serve the Creative to a Specified Spot

To create a task that specifies the spot where the creative will be served when the external event is fired:

1. Sign in to SAS Customer Intelligence 360.
2. Click **Tasks**.
3. Click .
4. Click **Web**.
5. Select the spot that you created in "Step 6. Create a Spot to Display Treatments That Were Imported as Creatives".
6. Click **Select Content**.
7. Select **Create a staged creative task that delivers content that is staged by an external system**.
8. Click **Create Task**.

9 On the **Content** tab, click **Select content** (+) where the spot is displayed.

10 In the **Select Content** window, select **Creatives** from the list next to the **Search** field.

11 Select the creative that you created in "Step 5. Import the Uploaded Treatments as Creatives in SAS Customer Intelligence 360".

12 Click **OK**.

13 Click .

14 Enter information in the **Name** field and click **Save**.

15 Navigate to the **Orchestration** tab and select **Mark Ready**.

16 To promote the task from a Ready status to an Active status, click **Publish**.

Step 8. Run the SAS Real-Time Decision Manager Campaign

Run the SAS Real-Time Decision Manager Campaign. If you completed the instructions in use case "Triggering a Campaign from a SAS Customer Intelligence 360 Event" on page 835, a click event on the website calls the SAS Real-Time Decision Manager campaign.

Otherwise, you must use a REST API call to send the information. Send a POST call similar to this example:

```
POST http://<server:port for the SAS Real-Time Decision Manager midtier>/RTDM/rest/runtim
```

Set the body of the call to JSON code that provides the inputs for the campaign:

Note: If the event contains an identity (other than datahub_id) that is not recognized by SAS Customer Intelligence 360, the external API gateway requests SAS Customer Intelligence 360 to create a new ID for that identity. If "datahub_id" is passed in the event as the identity and “datahub_id” is not recognized by SAS Customer Intelligence 360, the record will not be processed. For more information, see “Identity Types” on page 169.

```
{
  "version": 1,
  "correlationId": "11",
  "clientTimeZone": "America/New_York",
  "inputs": {
     "request variable from RTDM event": "subject_id_value”,
     "Other request variables:value pairs if needed"
  }
}
```

Injecting an External Event into SAS Customer Intelligence 360

Prerequisites for Injecting an External Event

To set up SAS Customer Intelligence 360 and the SAS Customer Intelligence 360 access point in order to inject an external event from SAS Event Stream Processing that enables a creative to be served to a website for a specified customer, complete the steps in “Setting Up the External API Gateway” on page 813. These steps include setting up the customer identity, creating an access point definition, and downloading the access point SDK to an on-premises system.

The endpoint is https://extapigwservice-<*server*>/marketingGateway/events.

Note: You must know the name of the access point definition and the tenant ID and client secret that are assigned to the access point definition.

Note: There are two ways to inject an external event into SAS Customer Intelligence 360:

- If you are running a general agent on premises, you can use http://<*hostname:port where agent is running*>/events. In this case, the agent forwards the message to SAS Customer Intelligence 360, and no JSON web token (JWT) is required in the message to the agent. (The token is added by the agent.)
- Send the message directly to the SAS Customer Intelligence 360 gateway at https://<*gateway hostname*>/marketingGateway/events. In this case, the authorization header must contain the JWT.

Step 1. Create an External Application Definition

To create an external event, an external application definition must be associated with the event. This definition is used to configure which external applications are allowed to inject which external events. External events that are coming from the wrong application must be dropped.

1 Select **General** ⇨ **External Applications**.

2 Click .

3 Enter information in the **Application name** and **Application ID** fields.

   Note: The application ID must match the ID for the external event.

4 Click **Done**.

Step 2. Create an External Event Definition

Note: Only external events can be injected from SAS Event Stream Processing into SAS Customer Intelligence 360 through the external API gateway.

To define the name of the event that is injected through the external API gateway or through the access point:

1 Click **Events**.

2 Click and select **External**.

3 Select the application that you created in “Step 1. Create an External Application Definition ” on page 850.

4 Click **Create Event**.

5 On the **Event Details** ⇨ **Action Details** tab, view the applications where the event occurs and enter a unique event ID. Click to modify the selection of applications.

   Note: The Event ID does not need to match the configuration for the access point.

6 On the **Event Details** ⇨ **Event Attributes** tab, specify custom event attributes by clicking **+**.

   Note: After an event is published, you can add new attributes but you cannot modify existing attributes.

   Adding attributes enables you to collect additional information about the action that triggers the event and the page that contains the event. The attribute data that is collected can be used elsewhere. For example, attributes that you add to this event can be selected as criteria when you define a segment. The available attributes vary by event type.

7 (Optional) Select **Personally identifiable information** if the associated data is considered personal information. For some attribute types, this option is not available.

   When this option is enabled, the system stores the data in a temporary table. The data is then discarded after it is used by associated tasks.

8 Click .

9 Enter information in the **Name** field, and then click **Save**.

   Note: The event name must match the configuration for the on-premises access point and in the actual event that is sent into the access point.

10 Navigate to the **Orchestration** tab and select **Mark Ready**.

11 To promote the event from a Ready status to an Active status, click **Publish**.

Step 3. Send in an External Event Using the Access Point REST Interface

Use the following values for the REST API call to send in an external event:

- URL: http://<*server.port where the agent is running*>/events

  Note: The default port is 8080. However, if multiple access points are running on different ports, the port number in the REST API request must match the access point that is sending external events to SAS Customer Intelligence 360.

- Authorization Type: "No Auth"
- Content-type: application/json
- HTTP Method: POST
- Body (raw):

  Note: The identity field that is used in the REST call (in this example, `subject_id`) must match one of the “identityField” attributes in the external event mappings file. For more information, see “Set Up Customer Identities for Access Points” on page 817.

```
{
  "eventName": "name of external event created above",
  "subject_id": "identity of user who will see the creative in the web site
    when this event is injected (for example, 114431)",
  “applicationId”: “identity of external application definition created in
    SAS Customer Intelligence 360 to process external events”
  "attribute1": "attribute1 value"
 }
```

  Note: If the event contains an identity that is not recognized by SAS Customer Intelligence 360 (other than the internal system ID), the external API gateway requests SAS Customer Intelligence 360 to create a new internal ID for that identity. If the internal ID is passed in the event as the identity and the internal ID is not recognized by SAS Customer Intelligence 360, the record is not processed. For more information, see “Identity Types” on page 169.

  Note: You can specify external identities to be associated with the access point. When you inject an event, one of those external identities (“email_id,” “login_id,” “subject_id,” or “customer_id”) must have a value specified in the injected event. Alternatively, “datahub_id” can have a value specified in the injected event. For example, if you associate “login_id” with the access point, each event that is injected must have either a “login_id:value” or a “datahub_id:value” entry in the injected message. If the injected event has neither entry, the http request returns an “HTTP 400 (Bad Request)” error message.

More Information

Click these links to find information about the following actions:

- Configuring the access point on page 54

- Starting the access point on page 66
- Using messages on page 437
- Using creatives on page 435
- Using events on page 457

Injecting SAS Event Stream Processing Events

Prerequisites

To inject SAS Event Stream Processing events into SAS Customer Intelligence 360, make sure that you have completed these prerequisites:

- Have access to SAS Customer Intelligence 360, and complete the steps for onboarding and environment configuration.
- Install and license SAS Event Stream Processing on a local system.
- Complete the steps in "Setting Up the External API Gateway" on page 813.. These steps include setting up the customer identity, creating an access point definition, and downloading the access point SDK to an on-premises system.

  Note: You must know the name of the access point definition and the tenant ID and client secret that are assigned to the access point definition.

Step 1. Create a Creative to Be Served When the SAS Event Stream Processing Event Is Injected

To create a creative in SAS Customer Intelligence 360 that is eventually displayed to the customer when the SAS Event Stream Processing event is injected:

1. Determine the location of a PNG file that contains an image that you want to be displayed when the external event is injected.
2. Sign in to SAS Customer Intelligence 360.
3. From the navigation bar, click **Creatives**.
4. Click .
5. Click **HTML**.
6. Click .
7. Click **From URL** and then enter the **Image URL** for the PNG file.

8 In the **Alternative text** field, enter a name for the image.

9 Click **Done**.

10 Click .

11 Click .

12 Enter a name for the creative and click **Save**.

13 When your creative is ready to be published, navigate to the **Orchestration** tab and update the status.

- Select **Mark Ready** to change the status from Designing to Ready. A Ready status indicates that this item is ready to be published. When you are ready to promote an item from a Ready status to an Active status, click **Publish**.

  Note: When you publish an item, you are prompted to publish any dependent items that are marked Ready.

  Items with a Ready status can be changed back to a Designing status by clicking **Return to Designing**. Changing this status to Designing prevents the item from being published.

  Note: If your item has a Ready status and a start date, the item is not automatically published when the start date is reached. For example, if you are creating a task, it must be published in order for the start date to activate the task.

- Select **Mark Ready and Publish** to change the status from Designing to Active. Items with an Active status cannot be changed back to Designing.

If the content of a published item is changed and saved, that item becomes out of sync with the published version. To synchronize the content, select **Republish**. Otherwise, the item stays out of sync with the published version and the updates are not delivered.

For more information, see "Republishing Out of Sync Items" on page 138.

Step 2. Create an External Application Definition

To inject an external event from SAS Event Stream Processing that is on premises, an external application definition must be associated with the event. This definition is used to configure which external applications are allowed to inject which external events. External events that are coming from the incorrect application must be dropped.

1 Sign in to SAS Customer Intelligence 360.

2 Select **General Settings** ⇨ **External Applications**.

3 Click .

4 Enter information in the **Application name** and **Application ID** fields.

Note: The application ID must match the name of the on-premises access point.

5 Click **Done**.

Step 3. Create an External Event Definition in SAS Customer Intelligence 360

To define the name of the event that is injected through the external API gateway or through the access point from SAS Event Stream Processing:

1. Sign in to SAS Customer Intelligence 360.
2. Click **Events**.
3. Click and select **External**.
4. Select the application that you created in "Step 2. Create an External Application Definition " on page 854.
5. Click **Create Event**.
6. Enter an **Event ID**.
7. Click .
8. Enter information in the **Name** field and click **Save**.

   Note: The event name must match the configuration for the on-premises access point and in the actual event that is sent into the access point.
9. Navigate to the **Orchestration** tab and select **Mark Ready**.
10. To promote the event from a Ready status to an Active status, click **Publish**.

Step 4. Create a Spot to Display the Creative

To define the spot on the website that displays the creative:

1. Sign in to SAS Customer Intelligence 360.
2. Click **Spots**.
3. Click and select **Web Spot**. The website of the spot's location is displayed.
4. Navigate to the page that contains the spot.
5. Click **Select**, and then click the spot.
6. Click **Create Spot**.
7. Enter an **Event ID**.
8. Click .
9. Enter information in the **Name** field and click **Save**.

10 Navigate to the **Orchestration** tab and select **Mark Ready**.

11 To promote the spot from a Ready status to an Active status, click **Publish**.

Step 5. Create a SAS Event Stream Processing Model from Which the SAS Customer Intelligence 360 Event Is Generated

To create a SAS Event Stream Processing model that accepts the SAS Customer Intelligence 360 event that is sent:

1. Sign in to the local server with a SAS Event Stream Processing installation.
2. Navigate to `<`***SAS Event Stream Processing install directory***`>/src`.
3. Follow the instructions in the README file to create the subscribe server.
4. Navigate to `<`***SAS Event Stream Processing install directory***`>/src/subscribe_server`.
5. Open the subscribe_server.cpp file and add the following information to the Initialize function:

```
//     **********************   Create the Project  **********
dfESPproject *sub_project2 = engine->newProject("sub_project2");

//     **********************   Create the Continuous Query  ***
dfESPcontquery *subscribeServer5 = sub_project2->
    newContquery("espEvents");

//     **********************   Create the Window  **********
dfESPwindow_source *espEventsSubscribe =
subscribeServer5->
    newWindow_source("espEventsSubscribe",
dfESPindextypes::pi_HASH,
    dfESPstring("rowKey*:string,subject_id:string,
score:int64 "));

// Enable this window to support clients via the pub/sub API.
sub_project2->enableWindowSubs(espEventsSubscribe);
```

Note: The window name and variables are used when configuring the on-premises access point. One of the variables usually contains the identity of the customer so that SAS Event Stream Processing can perform per-customer processing.

Step 6. Configure the On-Premises Access Point SDK for Injecting SAS Event Stream

Processing Events Into SAS Customer Intelligence 360

In order for on-premises processes to interact with SAS Customer Intelligence 360, an on-premises access point SDK must be downloaded from SAS Customer Intelligence 360 and configured. For information about downloading the on-premises access point SDK, see "Add a General Access Point" on page 54. Information about setting up the access point is included in the On Premise Agent Installation Guide.docx for the downloaded access point SDK.

To configure the on-premises access point to publish SAS Event Processing events to SAS Customer Intelligence 360, edit these files in the unzipped SDK:

1 Open the config/agent-endpoints.properties file, and modify the event.streaming.endPointNodeName property:

```
event.streaming.endPointNodeName=extapigwservice-<server name>:443
event.streaming.eventStreamProcessingEndpoint=dfESP:
//<address of ESP install>:9292
```

Set the server name based on your region:

- For USE, set the server name to this value: **prod.ci360.sas.com**
- For EUW, set the server name to this value: **eu-prod.ci360.sas.com**

2 Open the config/event-streaming-configuration.properties file, and modify these properties:

```
event.streaming.tenantID=<tenantID from the "Create an access point definition"
  step>
event.streaming.clientSecret=<clientID from the "Create an access point
  definition" step>

# Set all unused properties to false.
```

3 Create the eventStreamProcessing-to-customerIntelligence-event-mappings.json file. Use JSON code similar to the following example:

```
{
  "eventStreamProcessingToCustomerIntelligenceStream": [
    {
      "eventName": "name of external event created above",
      "eventStreamProcessingWindow": "name of ESP window
         created above for example, sub_project2/espEvents/
         espEventsSubscribe",
      "eventStreamProcessingMappings": {
          "subject_id": "subject_id",
          "score": "score"
      }
    }
  ]
}
```

4 Open the data/agent-name.properties file and modify the event.streaming.agentName property:

```
event.streaming.agentName=<name of access point used
   from the "Create an Access Point Definition" step>
```

Step 7: Start the Access Point

1 Verify that the Java (1.8 or later) executable is in your PATH or that the JAVA_HOME environment variable is set.

2 Enter this command:

```
* cd <SDK path>/bin
```

3 To start the access point, run the UNIX script or the Windows script that is in the bin folder. The access point prompt (>) appears in the user interface.

   To stop the access point, enter **`agent stop`** on the command line and press Enter.

   As the access point runs, it listens to port 8080 (by default) for REST requests with external events.

Step 8. Publish an Event

1 Sign in to the local server with a SAS Event Stream Processing installation.

2 Navigate to **`<SAS Event Stream Processing install directory>/src`**.

3 Follow the instructions in the README file to build the csv2bin and publish_client utilities.

4 Navigate to **`<SAS Event Stream Processing install directory>/src/publish_client`** folder.

5 To match the variables in the SAS Event Stream Processing window created earlier, create a test.csv file that contains the following variables:

```
i,n,"1","114431",11
```

6 Execute this command to generate the .bin file:

```
../csv2bin/csv2bin -s
"rowKey*:string,subject_id:string,score:int64" -o
test.bin < test.csv
```

7 Execute this command to inject the event into the SAS Event Stream Processing window:

```
./publish_client
dfESP://localhost:9292/sub_project2/
espEvents/
espEventsSubscribe < test.bin
```

Step 9. Verify the Creative Was Served to the Specified Spot

1 Navigate to the page on the website where the customer signs in and sign the customer in.

2 Navigate to the page that contains the spot where the creative should be served.

3 Verify the creative is displayed.

Publishing an Event to a SAS Event Stream Processing Window

Prerequisites

To publish a SAS Customer Intelligence 360 event to a SAS Event Stream Processing window:

- Create a stack where a tenant has been onboarded and configured.
- Install and license SAS Event Stream Processing on a local system.
- Complete the steps in "Setting Up the External API Gateway" on page 813, including setting up the customer identity, creating an access point definition, and downloading the access point SDK to an on-premises system.

  Note: You must know the name of the access point definition and the tenant ID and client secret that are assigned to the access point definition.

Step 1. Create a Click Event Definition in SAS Customer Intelligence 360

To configure an event to be generated when the customer clicks a spot on the website:

1 Sign in to SAS Customer Intelligence 360.

2 Click **Events**.

3 Click and select **Click**.

4 Navigate to the web page that contains the click target that will be published to a SAS Event Stream Processing window.

5 Select the click target and click **Select Parent** to refine the selector. Click **Create Event**.

Note: You can change or validate the selector anytime from the **Target Location** tab.

6 Click 💾.

7 Enter a name for the event (for example, *Ad100ClickedEvent*).

Note: The event name must match the name that is configured for the on-premises access point. (For instructions, see "Step 3. Configure the SAS Customer Intelligence 360 Access Point So That the Event Is Forwarded by the Access Point" on page 861.)

8 Make your event available to other items by clicking the **Orchestration** tab and selecting **Mark Ready**. This action changes the status of your event from Designing to Ready.

Click **Publish** to move the event from a Ready status to an Active status. Events with an Active status cannot be changed back to Designing. An event with an Active status does not prevent an item that contains the event from publishing.

Step 2. Create a SAS Event Stream Processing Model That Contains a Window Where the SAS Customer Intelligence 360 Event Will Be Published

To create a SAS Event Stream Processing model that accepts the event that is sent fromSAS Customer Intelligence 360:

1 Sign in to the local server with a SAS Event Stream Processing installation.

2 Navigate to **<*SAS Event Stream Processing install directory*>/src**.

3 Follow the instructions in the README file to create the subscribe server, but do not start the server.

4 Navigate to **<*SAS Event Stream Processing install directory*>/src/subscribe_server**.

5 Open the subscribe_server.cpp file and add this information to the Initialize function:

```
// ********************** Create the Project **********

dfESPproject *sub_project2 = engine->newProject("sub_project2");


// ********************** Create the Continuous Query ***

dfESPcontquery *subscribeServer4 = sub_project2->

newContquery("ci360Events");
```

```
// ********************** Create the Window **********

dfESPwindow_source *ci360EventsPublish =
subscribeServer4->

newWindow_source("ci360EventsPublish",
dfESPindextypes::pi_HASH,

dfESPstring("rowKey*:string,subject_id:string,eventName:string,

eventType:string,timeStamp:date,tenantId:int64,referrer:string"));


// Enable this window to support clients via the pub/sub API.

sub_project2->enableWindowSubs(ci360EventsPublish);
```

Note: The window name and variables are used when configuring the on-premises access point. One of the variables usually contains the identity of the customer so that SAS Event Stream Processing can perform per-customer processing.

Step 3. Configure the SAS Customer Intelligence 360 Access Point So That the Event Is Forwarded by the Access Point

In order for the on-premises access point to forward the event that was created in “Step 1. Create a Click Event Definition in SAS Customer Intelligence 360” on page 859 , associated events must be configured in the definition for the external access point in SAS Customer Intelligence 360.

To configure the associated events for the access point definition:

1 Sign in to SAS Customer Intelligence 360.

2 Navigate to and then select **External** ⇨ **Access**.

3 Open the access point that was created in “Create an Access Point Definition” on page 815.

4 Select **Select events**, and then complete these actions:

   a Click .

   b Select the check box in the row for the event that you created in “Step 1. Create a Click Event Definition in SAS Customer Intelligence 360” on page 859

   c Click **OK**.

5 Click **Done**.

Step 4. Configure the On-Premises Access Point SDK for Publishing a SAS Customer Intelligence 360 Event to a SAS Event Stream Processing Window

In order for on-premises processes to interact with SAS Customer Intelligence 360, an on-premises access point SDK must be downloaded from SAS Customer Intelligence 360 and configured. For information about downloading the on-premises access point, see “Add a General Access Point” on page 54. Information about setting up the access point is included in the On Premise Agent Installation Guide.docx for the downloaded access point SDK.

To configure the on-premises access point to publish some SAS Customer Intelligence 360 events to a SAS Event Stream Processing window, edit these files in the unzipped SDK:

1 Open the config/agent-endpoints.properties file and modify these properties:

```
event.streaming.endPointNodeName=extapigwservice-<server name>:443
event.streaming.eventStreamProcessingEndpoint=dfESP:
//<address of ESP install>:9292
```

Set the server name based on your region:

- For USE, set the server name to this value: **prod.ci360.sas.com**
- For EUW, set the server name to this value: **eu-prod.ci360.sas.com**

2 Open the config/event-streaming-configuration.properties and modify these properties:

```
event.streaming.tenantID=<tenantID from the "Create an agent definition" step
  in the common document>
event.streaming.clientSecret=<clientID from the "Create an agent definition"
  step in the common document>

#Set all unused properties to false.
```

3 Create the customerIntelligence-to-eventStreamProcessing-event-mappings.json file to map the SAS Customer Intelligence 360 event to a SAS Event Stream Processing window:

```
{
  "eventStreamProcessingStream": [
    {
      "eventName": "Ad100ClickedEvent",
      "eventStreamProcessingWindow": "sub_project2/ci360Events/ci360EventsPublish",
      "eventStreamProcessingMappings": {
        "rowKey": "rowKey",
        "subject_id": "subject_id",
        "eventName": "eventname",
        "eventType": "event_type",
        "timeStamp": "entryTimeStamp",
        "referrer": "referrer",
        "tenantId": "tenantId"
      }
```

```
    }
  ]
}
```

Step 5: Start the Access Point

1 Verify that the Java (1.8 or later) executable is in your PATH or that the JAVA_HOME environment variable is set.

2 Enter this command: `* cd <SDK path>/bin`.

3 To start the access point, run the UNIX script or the Windows script that is in the bin folder. The access point prompt (>) appears in the user interface.

   To stop the access point, enter **`agent stop`** and press Enter.

   As the access point runs, it listens to port 8080 (by default) for REST requests with external events.

   Note: For information about setting unique ports for access points, see the On Premise Agent Installation Guide.docx in the doc folder in the access point SDK ZIP file.

Step 6. Generate the Web Event

To generate the event to be published to the SAS Event Stream Processing window:

1 From the website, navigate to the page where the customer signs in and sign the customer in.

2 Navigate to the page with the spot where the click event was configured.

3 Click the spot.

Step 7. Verify the Event Was Published to the SAS Event Stream Processing Window

1 Sign in to the local server with a SAS Event Stream Processing installation.

2 Navigate to **`<`*`SAS Event Stream Processing install directory`*`>/src`**.

3 Follow the instructions in the README file to build the subscribe client.

4 Start the subscribe client by entering this command:

```
./subscribe_client dfESP:
//localhost:9292/sub_project2/ci360Events/
ci360EventsPublish?snapshot=true
```

All data from the SAS Event Stream Processing window is displayed. You can also set `snapshot=false` to display only the data that was added after the client was started. In this case, you must start the subscribe_client before generating the event as described in "Step 6. Generate the Web Event" on page 863.

Retrieve On-Premises Data Using a SAS Real-Time Decision Manager Campaign

Prerequisites

To enable SAS Customer Intelligence 360 to retrieve on-premises data using a SAS Real-Time Decision Manager campaign, you must first complete the steps in "Setting Up the External API Gateway" on page 813, including setting up the customer identity, creating an access point definition, and downloading the access point SDK to an on-premises system.

Note: You must know the identity type for the identity that is used by the external API gateway and access point, the name of the access point definition, and the tenant ID and client secret that are assigned to the access point definition.

Step 1. Create a Trigger Event Definition in SAS Customer Intelligence 360

To configure an event to be generated when the customer clicks a spot on the website:

1. Sign in to SAS Customer Intelligence 360.
2. Click **Events**.
3. Click and select an event type.
4. Follow the instructions for creating the event type in Chapter 27, "Creating Web Events," on page 309.

   Note: The event name must match the name that is configured for the on-premises access point. (For instructions, see "Step 5. Configure the SAS Access Point So That the Trigger Event Is Forwarded to the Access Point" on page 866.)

Step 2. Create a Campaign to Be Executed When a SAS Customer Intelligence 360 Event Occurs

1 Sign in to SAS Real-Time Decision Manager and create an event definition.

   Note: The name and request variables for the event are used when sending the REST request into the engine to run the campaign. Usually, one of the request variables contains the identity of the customer triggering the event “subject_id” so that the SAS Real-Time Decision Manager campaign can look up customer data when determining the output of the campaign. Reply variables must also be defined for the event to contain the data that is returned to SAS Customer Intelligence 360.

2 Create the SAS Real-Time Decision Manager campaign using the event that was created in the previous step.

   Note: Consider using existing customer data to create a branch node or to create a process node that retrieves data for the customer.

3 Mark the campaign for deployment.

4 Deploy and activate the campaign in the Decision Services engine.

Step 3. Create an External Application Definition

To create an external event, an external application definition must be associated with the event. This definition is used to configure which external applications are allowed to inject which external events. External events that are coming from the wrong application must be dropped.

1 Sign in to SAS Customer Intelligence 360.

2 Select **General Settings** ⇨ **External Applications**.

3 Click .

4 Enter information in the **Application name** and **Application ID** fields.

   Note: The application ID must match the ID for the external event in “Step 4. Create an External Event Definition” on page 866.

5 Click **Done**.

Step 4. Create an External Event Definition

To define the name of the event that is injected through the external API gateway or through the access point:

1 Sign in to SAS Customer Intelligence 360.

2 Click **Events**.

3 Click and select **External**.

4 Select the application that you created in "Step 1. Create an External Application Definition " on page 850.

5 Click **Create Event**.

6 Enter an **Event ID**.

7 On the **Event Attributes** tab, define the attributes in the external event that contains the data returned from the SAS Real-Time Decision Manager campaign. The attribute names must match the names of the reply variables that are defined in the campaign.

8 Click .

9 Enter information in the **Name** field and click **Save**.

Note: The event name must match the configuration for the on-premises access point and in the actual event that is sent to the access point.

10 Navigate to the **Orchestration** tab and select **Mark Ready**.

11 Click **Publish**.

Step 5. Configure the SAS Access Point So That the Trigger Event Is Forwarded to the Access Point

1 Sign in to SAS Customer Intelligence 360.

2 Navigate to **General Settings** and then select **External** ⇨ **Access**.

3 Open the access point that you created in "Setting Up the External API Gateway" on page 813.

4 Select **Associations**.

5 Select **Select events**, and then click .

6 Select the row for the trigger event that you created in "Step 2. Create an External Event Definition" on page 851. Click **OK**.

7 Click **Done**.

Step 6. Configure the On-Premises Access Point SDK

In order for on-premises processes to interact with SAS Customer Intelligence 360, an on-premises access point SDK must be downloaded from SAS Customer Intelligence 360 and configured. For information about downloading the on-premises access point SDK, see “External Access” on page 53. Information about setting up the access point is included in the On Premises Agent Installation Guide.docx file in the downloaded mkt_extapigw.sdk.zip file.

The on-premises access point SDK must be configured in order to perform the following actions:

- run a SAS Real-Time Decision Manager campaign when the trigger event occurs
- return the result from running the campaign as a SAS Customer Intelligence 360 external event

To configure the on-premises access point SDK:

1 Open the config/agent-endpoints.properties file and modify this property:

```
event.streaming.endPointNodeName=extapigwservice-<stackname_here>:443
event.streaming.rtdmEndpoint=http://<address of RTDM install>/RTDM/rest/
runtime/decisions
```

The property for USE must be

```
event.streaming.endPointNodeName=extapigwservice-prod.ci360.sas.com:443
```

because the stack name is *prod.ci360.sas.com*. The property for EUW must be

```
event.streaming.endPointNodeName=extapigwservice-eu-prod.ci360.sas.com:443
```

because the stack name is *eu-prod.ci360.sas.com*.

2 Open the config/event-streaming-configuration.properties file and modify these properties:

```
event.streaming.tenantID=<tenantID from the "Create an access point definition"
step>
event.streaming.clientSecret=<clientID from the "Create an access point definition"
step>

# Set all unused properties to false.
```

3 Create the ci360-to-rtdm-event-mappings.json file to map the SAS Customer Intelligence 360 event to a SAS Real-Time Decision Manager event:

```
{
      "rtdmStreams": [
        {
"eventName": "name of CI360 Trigger Event created above",
"rtdmEvent": "name of RTDM Event created above",
“responseEventName”: “name of CI360 external event created above”,
            "rtdmEventMetadata": {
```

```
    "name of RTDM request variable": "type of RTDM request variable",
    "name of RTDM another request variable": "type of another RTDM request variable
            },
            "rtdmEventMappings": {
"CI360 event variable": " name of RTDM request variable ",
"another CI360 event variable": " name of another RTDM request
variable "
            }
        }
      ]
    }
```

Step 7. Start the Access Point

1 Verify that the Java (1.8 or later) executable is in your PATH or that the JAVA_HOME environment variable is set.

2 Enter the following command: * cd <SDK path>/bin

3 To start the access point, run the UNIX script or the Windows script that is in the bin folder. The access point prompt (>) appears in the user interface.

   To stop the access point, enter **agent stop** and press Enter.

   As the access point runs, it listens to port 8080 (by default) for REST requests with external events.

   Note: If multiple access points are running, all of the access points must be assigned unique ports. For more information, see the On Premises Agent Installation Guide.docx file that is included in the downloaded mkt_extapigw-sdk.zip file.

Step 8. Generate the Web Event

To generate the event that triggers the execution of the SAS Real-Time Decision Manager campaign:

1 From the website, navigate to the page where the customer signs in and sign the customer in.

2 Navigate to the page with the spot where the click event was configured.

3 Click the spot.

Using the REST API to Bulk Load External Events

To transmit external events to the external API gateway in bulk for processing:

1. Set up the external API gateway on page 813 and verify that you can connect to it.

2. Send a POST call to the bulkEeventsFileLocation endpoint to get a temporary S3 URL for a bulk request. Use a call similar to this example:

```
POST https://extapigwservice-<server>/marketingGateway/bulkEventsFileLocation
```

   Set the server name based on your region (for example, USE, EUW, or APN).

   In the body of the REST call, specify the JSON code for the event generator:

```
{
  "version":1,
  "applicationId":"eventGenerator"
}
```

   Note: Use the signed S3 URL returned by the external API gateway for only one bulk external events request. You must get a new address for each bulk request.

   After receiving a successful return code of 200, the return value from the call contains the signed S3 file location. The return code looks similar to this example:

```
{
    "version": 1,
    "links": [
      {
        "method": "PUT",
        "rel": "self",
        "href": "https://<temporary URL>/transfers/dev/2017032915/
                MAExternalOPDMaster/abc/9df245fdf827e8d5b3505bd1e8184cc4?
                X-Amz-Security-Token=<security token>&X-Amz-Algorithm=AWS4-HMAC-SHA256
                &X-Amz-Date=20171218T140105Z&X-Amz-SignedHeaders=content-type%3Bhost&X-Amz-Expires=899
                &X-Amz-Credential=<credentials>&X-Amz-Signature=<signature>",
        "uri": null,
        "type": "application/octet-stream"
        }
    ],
    "creationTimeStamp": "2017-12-18T14:01:05.318Z",
    "expiresTimeStamp": "2017-12-18T14:16:05.318Z"
}
```

3. Create a local comma-separated-value (CSV) file that contains the external event values that you want to upload. The file must contain one event per line. Each event uses the following format:

```
<external event name>,<identity type>,<identity value>,<attribute name 1>,<attribute value 1>,<attribute name 2>,<attribute value 2>...
```

   Note: The CSV file that you create cannot contain header rows.

The CSV file must contain only external events that are valid, or the file cannot be processed.

Note: If the event contains an identity (other than datahub_id) that is not recognized by SAS Customer Intelligence 360, the external API gateway requests SAS Customer Intelligence 360 to create a new ID for that identity. If "datahub_id" is passed in the event as the identity and “datahub_id” is not recognized by SAS Customer Intelligence 360, the record will not be processed. For more information, see “Identity Types” on page 169.

4 Send a PUT request to the temporary URL from step 1. The REST call is similar to this example:

```
PUT https://<temporary URL>/transfers/dev/2017032915/
   MAExternalOPDMaster/abc/9df245fdf827e8d5b3505bd1e8184cc4?X-Amz-Security-Token=<s
   &X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Date=20171218T140105Z&X-Amz-SignedHeader
   %3Bhost&X-Amz-Expires=899&X-Amz-Credential=<credentials>&X-Amz-Signature=<signat
```

Note: Your PUT request must have a header of Content-Type = application/octet-stream.

After receiving a successful return code of 200, the following script appears:

```
Content-Type application/octet-stream
Body Type binary
Select File <uploaded file>
```

After the file is uploaded, SAS Customer Intelligence 360 reads the file and generates an event in SAS Customer Intelligence 360 for each row of the file.

Downloading Data from SAS Customer Intelligence 360

SAS Customer Intelligence 360 Download API Design and Implementation Overview

The SAS Customer Intelligence 360 Download API provides a simple method for consumers to request data for download, either for a specific date range or without any date range at all. This API returns pre-signed URLs for download to data files per entity per hour (one pre-signed URL per data file). These pre-signed URLs are valid for one hour. The SAS Customer Intelligence 360 Download API returns a response instantaneously, without any data preparation required for the specific time period. The data is returned via paginated responses, as the data could be spread across multiple hours, days, or months, thus leading to many pre-signed URLs. Links are available so that users can navigate through the complete paginated view. The same mechanism and structure are used for the detail and Discover base table (DBT) report marts, as well as for the identity tables; only the endpoint is different.

Data Availability

The SAS Customer Intelligence 360 Download API provides access to up to 62 days of detail data and up to 124 days of DBT data.

Downloading Data from SAS Customer Intelligence 360

Use the external API gateway to download data that was collected by SAS Customer Intelligence 360. After setting up the access point in the user interface, you access the SAS Customer Intelligence 360 Download API through a REST client or by using PROC HTTP in SAS.

To set up and use this API:

1 Set up the access point in SAS Customer Intelligence 360.

   In this step, you determine the URL to use for the REST calls to the API. This step is performed only once at the beginning of the process.

2 Generate the JSON Web token (JWT) . This step is performed only once at the beginning of the process (or whenever the client secret is changed).

3 Use REST to get a list of signed URLs for downloading the data.

   The data files have the following characteristics:

   - Data files are gzipped and are delimited by the 0x01 (start of heading) ASCII character.
   - Data files are downloaded via HTTPS URLs that are valid for 1 hour before expiring.

   Here are the types of files that you can download from the API:

   - non-partitioned identity data files. For more information about how SAS Customer Intelligence 360 generates this type of data, see Chapter 19, “Managing Customer Identities,” on page 167.
   - partitioned detail data files. These files are downloaded as packages that are partitioned in hourly chunks.
   - DBT files from the report mart. DBTs are data tables that are organized by subject area and are ready for processing and analytics downstream. Only completed sessions are available for download.

   For more information about the detail mart, see “Discover 2.0” on page 1073.

   For more information about the DBTs, see “Discover Base Table Mart Tables and Columns” on page 1108.

4 Download and process the data file.

Send a REST Call to Get the Download Location

After you have generated the JWT, use a REST call to get a list of data files and schema files (in JSON format) to download. You can issue REST calls from a REST client (such as REST Client for Firefox or the stand-alone Insomnia REST Client), the PROC HTTP method in SAS, or a command line application such as curl.

Generally, the URL for a REST call looks similar to this example:

```
GET https://<external gateway address>/discoverService/dataDownload/eventData/
detail/<download_type>?params...
```

Use these guidelines to construct the URLs:

- The protocol for the REST call is HTTPS.
- The external gateway address for the SAS Customer Intelligence 360 Download API depends on the region in which your tenant is hosted. The external gateway address can be obtained by logging in to SAS Customer Intelligence 360 and opening the list of access points under **General** ⇨ **Access**. The address is shown directly above the list of defined access points.
- With each REST call, be sure to include the JWT in the header. The JWT must be passed as a bearer token in the header of the REST call. Depending on the tool being used, this can be accomplished as follows:
  - In SAS, specify the header statement in PROC HTTP. For example:

    ```
    proc http
       url="<REST call>"
       out=resp;
     headers
       "token"="<JWT>";
    run;
    ```

  - Specify the JWT in the header option or header tab of the REST client that you are using. For more information, see the documentation for your REST client. Typically, the value for the JWT is similar to this example:

    ```
    Bearer <JWT>
    ```

  - If you are using curl to send REST calls, specify the JWT with the **-H** parameter. Use a call similar to this example:

    ```
    curl -X GET '<HTTP address>'
       -H 'Authorization: Bearer <JWT>'
    ```

The URL string for the REST call depends on the data that you want to download:

- non-partitioned identity data
- partitioned detail data
- DBT data from the report mart

About Invocation Modes

For data in the detail mart and the DBT report mart, the SAS Customer Intelligence 360 Download API supports either a default invocation mode where no date range is requested or a specific date range invocation mode, which is used when you specify the dataRangeStartTimeStamp and dataRangeEndTimeStamp parameters.

Here is more information about these modes:

default

The default invocation mode occurs when you do not pass start and end date ranges. This mode is typically useful in the following cases:

- You do not have a specific date range to use.
- You want to navigate through the entire range of data that is available.
- It is the initial download of data.

The response to a REST call in this mode returns a paginated view of all data that is available for download from the most recent to the oldest. Pagination is required because the number of data files is based on the number of time periods that are available in the partitioned storage, and the amount of data might be very large.

For example, the response to the first REST call contains this information:

- URLs for the latest `n` hours of data, where `n` is the pagination size limit.
- links to navigate the pages of data. These navigation URIs enable you to navigate to specific points in the past, page by page, or directly back to the oldest data.

The limit= parameter limits the number of date ranges shown and displays all files available for a given range. Otherwise, the API returns the last page of the paginated response, as well as links to the “First” and “Prev” pages. These links also contain the appropriate start= and limit= parameters to navigate to the appropriate page in the paginated response. The link to the “First” page contains “start=0” as one of the parameters.

For example, if approximately 70 hours of data exist for various tables, but you are not aware of the amount of data, the API can enable you to download all or part of the data via the paginated response mechanism. The initial API request without any specified parameters returns the “Last” page with the most recent 20 hours (driven by the limit= parameter, for which the default is 20). In this case, the “Prev” page would include “start=50” as a parameter, and the “First” page would include “start=0” as a parameter. The API also returns the overall count that is available (in this example, 70 hours). You can use this summary data (for example, start, limit, and count) along with links to the “First,” “Prev,” “Next,” and “Last” pages to download the data URL either from the beginning (start=0 for the initial load) or from any specific page onward (start=`n`).

You can also use date-bound querying to download data for specific hour ranges. Each hour would contain the download URL for various data files against each available table. If a particular table does not have any data for a specific hour, then that table would not be returned as part of the API, although the hour could be returned if other tables have data within that hour. Similarly, if there is no data for a specific hour for any table, then the hour itself would not be returned by the API.

This behavior is different from the specific date range invocation mode, in which you might not need to download as much past data.

> **TIP** You can also use the start and limit parameters to specify which record number to start from and how many records to fetch from the overall result set that is going to be returned in paginated form.To retrieve the most recent hour available, the limit parameter should be set to *1*:
>
> ```
> https://<external gateway address>/marketingGateway
>                   /discoverService/dataDownload/eventData/detail/partitionedData&limit=
> ```
>
> To retrieve the oldest data available, the start parameter should be set to *0* and the limit parameter should be set to *1*:
>
> ```
> https://<external gateway address>/marketingGateway
>                   /discoverService/dataDownload/eventData/detail/partitionedData?start=
> ```

For more information about these parameters, see the parameter tables for each data type.

specific date range

In the specific date range invocation mode, API users must specify the dataRangeStartTimeStamp and dataRangeEndTimeStamp parameters for the data download. This action is typically useful for cases in which users want to download data for a specific date range because they download data on a regular basis and keep track of the data that has already been downloaded.

The response to an API call returns a paginated view of the data falling within the requested date range available for download. Unlike the default invocation mode, the paginated response returns data from the oldest to the most recent.

In addition to date range parameters, you can use the start and limit parameters to specify which record number to start from and how many records to fetch from the overall result set that is going to be returned in paginated form.

For more information about these parameters, see the parameter tables for partitioned detail data or DBT data from the report mart..

Download Non-Partitioned Identity Data

Use this REST call:

```
GET https://<external gateway address>/discoverService/dataDownload/eventData/
  detail/nonPartitionedData?start=<start_index>&limit=<maximum_entries>
```

This REST call can have these parameters:

Note: Parameters are optional unless they are noted as being required.

Table 64.1 Parameters for Non-Partitioned Identity Data

Name	Type	Description
start	Number	The start index of the items to return. The default value is `0`.

Name	Type	Description
limit	Number	The maximum number of items to return. The default value is `20`.

For non-partitioned identity data, the SAS Customer Intelligence 360 Download API does not support the dataRangeStartTimeStamp and dataRangeEndTimeStamp parameters.

To avoid downloading tables that are not updated frequently, the REST response for this data type includes a lastModifiedTimeStamp for each file that is downloaded. The date value used is the UTC timestamp for when the file was last modified. The API uses the lastModifiedTimestamp to determine whether updated non-partitioned identity data is available. If the data is available, it is downloaded in its entirety as a single file. Otherwise, no data is downloaded.

The response looks similar to the following example:


```
{
    "links": [
        {
            "method": "GET",
            "rel": "self",
            "href": "/marketingGateway/discoverService/dataDownload/eventData
              /detail/nonPartitionedData",
            "uri": "/marketingGateway/discoverService/dataDownload/eventData
              /detail/nonPartitionedData"
        }
    ],
    "accept": "application/json application/xml",
    "start": 0,
    "count": 1,
    "items": [
        {
            "schemaUrl": "<endpoint>/discover/metadata/detail_schema_v1.json
               ?X-Amz-Security-Token=<JWT>",
            "schemaVersion": "1.0",
            "entities": [
                {
                    "entityName": "IDENTITY",
                    "dataUrlDetails": [
                        {
                            "url": "<endpoint>/dfs/data/detail/IDENTITY/
                              000000_0.gz?X-Amz-Security-Token=<JWT>",
                            "lastModifiedTimestamp": "2017-08-25T09:49:25.000Z"
                        }
                    ]
                },
                {
                    "entityName": "IDENTITY_ATTRIBUTES",
                    "dataUrlDetails": [
                        {
                            "url": "<endpoint>/dfs/data/detail/IDENTITY_ATTRIBUTES
                              /000000_0.gz?X-Amz-Security-Token=<JWT>",
                            "lastModifiedTimestamp": "2017-08-25T09:49:14.000Z"
                        }
```

```
                    ]
                },
                {
                    "entityName": "IDENTITY_MAP",
                    "dataUrlDetails": [
                        {
                            "url": "<endpoint>/dfs/data/detail/IDENTITY_MAP/
                              000000_0.gz?X-Amz-Security-Token=<JWT>",
                            "lastModifiedTimestamp": "2017-08-25T09:49:20.000Z"
                        }
                    ]
                }
            ]
        }
    ],
    "limit": 20,
    "version": 2
}
```


The response contains these entityName items:

- IDENTITY
- IDENTITY_ATTRIBUTES
- IDENTITY_MAP

The output has these data items:

- Links: self link
- Start: start of the record
- Count: total number of records

There are a number of items based on the limit set. Each item consists of the following parameters:

Table 64.2 *Download Non-Partitioned Identity Data*

Parameter	Description
schemaUrl	Metadata for all subject areas.
entityName	The subject area for the link that is provided.
dataUrlDetails	The link to data for a given range of entities. There can be multiple URLs for the same entity depending on the number of files available. The <*filename*>.gz file is downloaded after a user clicks the URL.
lastModifiedTimestamp	The date on which data for the entity was last modified.

Download Partitioned Detail Data

Use this REST call:

```
GET https://<external gateway address>/discoverService/dataDownload/eventData/
  detail/partitionedData?start=<start_index>
  &limit=<maximum_entries>&dataRangeStartTimeStamp=<start_time>&
  dataRangeEndTimeStamp=<end_time>
```

This REST call can have these parameters:

Note: Parameters are optional unless they are noted as being required.

Table 64.3 Parameters for Partitioned Detail Data

Name	Type	Description
start	Number	The start index of the items to return. The default value is `0`.
limit	Number	The maximum number of items to return. The default value is `20`.
dataRangeStartTimeStamp	Timestamp	The start timestamp to use in UTC format. For example: `2017-05-09T12:00:00.000Z`
dataRangeEndTimeStamp	Timestamp	The end timestamp to use in UTC format. For example: `2017-05-09T12:59:59.999Z`
includeAllHourStatus	True/False	When set to *true*, includes all ranges with the dataRangeProcessingStatus parameter with one of these values: DATA_AVAILABLE NO_DATA ERROR RESET_IN_PROGRESS
subHourlyDataRangeInMinutes	Integer	The number of minutes desired by the user. The default value is `60`.
schemaVersion	Integer	The schema version. The default value is `1`.

The response looks similar to the following example:

```
{
  "links": [
    {
      "method": "GET",
```

```
          "rel": "self",
          "href": "http://rdcesx08068.race.sas.com:8680/SASWebMarketingDiscoverService/rest/d
                detail?start=181&limit=10",
          "uri": "/datahub/eventData/detail?start=181&limit=10"
        },
        {
          "method": "GET",
          "rel": "first",
          "href": "http://rdcesx08068.race.sas.com:8680/SASWebMarketingDiscoverService/rest/d
                detail?start=0&limit=10",
          "uri": "/datahub/eventData/detail?start=0&limit=10"
        },
        {
          "method": "GET",
          "rel": "prev",
          "href": "http://rdcesx08068.race.sas.com:8680/SASWebMarketingDiscoverService/rest/d
                detail?start=171&limit=10",
          "uri": "/datahub/eventData/detail?start=171&limit=10"
        },
    {
                "method": "GET",
                "rel": "resets",
                "href": "http://datahubDiscoverService-dhubtest.cidev.sas.us:8080/SASWebMarke
                rest/dataDownload/eventData/partitionedData/resets?martType=detail",
                "uri": "/dataDownload/eventData/partitionedData/resets?martType=detail",
                "type": "application/json application/xml"
            }
      ],
      "accept": "application/json application/xml",
      "start": 181,
      "count": 191,
      "items": [
        {
          "dataRangeStartTimeStamp": "2016-12-07T19:00:00.000Z",
          "dataRangeEndTimeStamp": "2016-12-07T19:59:59.999Z",
          "schemaUrl": "schema-url",
          "schemaVersion": "1.0",
          "entities": [
            {
              "entityName": "PAGE_ERRORS",
              "dataUrlDetails": [
                {
                  "url": "https://discover-sample-data.s3.amazonaws.com/DWH/PART/PAGE_ERRORS/
                        month%3D12/day%3D7/hour%3D19/000000_0?x-amz-security-token=FQoDYXdzED
                        FSLEAiH7sT4isvVIe1YZuSKE0My0MqjTZo037pVtREGBE3hMS6DMz8xPoWG9AXT%2B5G3
                        I0peP7x88Vf8HkjHIqmKjbnC00MBf%2BWDOSfefAoqw%2BEVKtVKKf8nzLDmvUOGlio19
                        FazPIp%2Bv%2Fq6b3bJzo992VzKTLzT%2Bj%2FLDAkgkp7DdxCZNiN4TFi4Gdbu%2Bjvn
                        yAAcRmdpYPIG8A%2FXNG3zcCgABOE977kc16moLGjzLmDU94dSuaTXp42A4QW82DuYtsn
                        WVSyHH6fBcXV2IHb7W64p6hMEdwPTpQrP7ulW47ZYI5Wihr2u8j%2BotlzW2Qh6NJZiGN
                        sbU9ggV%2FGBgbu1oXMuUa9qSseRd7dNZvSj2%2BKHHBQ%3D%3D&AWSAccessKeyId=AS
                        &Expires=1491638580&Signature=0pTL9XgxzxijY7mBxkSSoSzRC6A%3D"
                }
              ]
            },
            {
              "entityName": "PAGE_ERRORS_NEW",
```

```
          "dataUrlDetails": [
            {
              "url": "https://discover-sample-data.s3.amazonaws.com/DWH/PART/PAGE_ERRORS_
                    %3D2016/month%3D12/day%3D7/hour%3D19/000412_0.gz?x-amz-security-token
                    DBvYDUGefSnzZDgxF    SLEAiH7sT4isvVIe1YZuSKE0My0MqjTZo037pVtREGBE3hMS
                    G3M16j57%2B4XK%2FO4zI0peP7x88Vf8HkjHIqmKjbnC00MBf%2BWDOSfefAoqw%2BEVK
                    OGlio19rNL%2Fj0M7BmNErLG4FazPIp%2B    v%2Fq6b3bJzo992VzKTLzT%2Bj%2FLD
                    4Gdbu%2Bjvnd3clEduI3It%2B9plRyAAcRmdpYPIG8A%2FXNG3zcCgABOE977kc16moLG
                    p42A4QW82DuYtsn1yR523NWZRNAmSjMmJWVSyHH6fBcXV2IHb7W64p6hMEdwPTpQrP7ul
                    j%2BotlzW2Qh6NJZiGNFf1R75mpAeyJ%2BKCQsbU9ggV%2FGBgbu1oXMuUa9qSseRd7dN
                    3D%3D&AWSAccessKeyId=ASIAITIUAJX4NY74BQOA&Expires=1491638580
                    &Signature=kVd%2BK8Lxdl%2Be644j2SFRfPW4mFc%3D"
            }
          ]
        }
      ]
    },
    {
      "dataRangeStartTimeStamp": "2016-12-07T20:00:00.000Z",
      "dataRangeEndTimeStamp": "2016-12-07T20:59:59.999Z",
      "schemaUrl": "schema-url",
      "schemaVersion": "1.0",
      "entities": [
        {
          "entityName": "PAGE_ERRORS",
          "dataUrlDetails": [
            {
              "url": "https://discover-sample-data.s3.amazonaws.com/DWH/PART/PAGE_ERRORS/
                    month%3D12/day%3D7/hour%3D20/000000_0?x-amz-security-token=FQoDYXdzED
                    FSLEAiH7sT4isvVIe1YZuSKE0My0MqjTZo037pVtREGBE3hMS6DMz8xPoWG9AXT%2B5G3
                    I0peP7x88Vf8HkjHIqmKjbnC00MBf%2BWDOSfefAoqw%2BEVKtVKKf8nzLDmvUOGlio19
                    FazPIp%2Bv%2Fq6b3bJzo992VzKTLzT%2Bj%2FLDAkgkp7DdxCZNiN4TFi4Gdbu%2Bjvn
                    yAAcRmdpYPIG8A%2FXNG3zcCgABOE977kc16moLGjzLmDU94dSuaTXp42A4QW82DuYtsn
                    WVSyHH6fBcXV2IHb7W64p6hMEdwPTpQrP7ulW47ZYI5Wihr2u8j%2BotlzW2Qh6NJZiGN
                    sbU9ggV%2FGBgbu1oXMuUa9qSseRd7dNZvSj2%2BKHHBQ%3D%3D&AWSAccessKeyId=AS
                    &Expires=1491638580&Signature=74FUF1y4ZaQJ%2BFjkqqONQFtAvFo%3D"
            }
          ]
        },
        {
          "entityName": "PAGE_ERRORS_NEW",
          "dataUrlDetails": [
            {
              "url": "https://discover-sample-data.s3.amazonaws.com/DWH/PART/PAGE_ERRORS_
                    %3D2016/month%3D12/day%3D7/hour%3D20/000413_0.gz?x-amz-security-token
                    DBvYDUGefSnzZDgxF    SLEAiH7sT4isvVIe1YZuSKE0My0MqjTZo037pVtREGBE3hMS
                    G3M16j57%2B4XK%2FO4zI0peP7x88Vf8HkjHIqmKjbnC00MBf%2BWDOSfefAoqw%2BEVK
                    Glio19rNL%2Fj0M7BmNErLG4FazPIp%2Bv%2Fq6b3bJzo992VzKTLzT%2Bj%2FLDAkgkp
                    Gdbu%2Bjvnd3clEduI3It%2B9plRyAAcRmdpYPIG8A%2FXNG3zcCgABOE977kc16moLGj
                    42A4QW82DuYtsn1yR523NWZRNAmSjMmJWVSyHH6fBcXV2IHb7W64p6hMEdwPTpQrP7ulW
                    %2BotlzW2Qh6NJZiGNFf1R75mpAeyJ%2BKCQsbU9ggV%2FGBgbu1oXMuU    a9qSseRd
                    D%3D&AWSAccessKeyId=ASIAITIUAJX4NY74BQOA&Expires=1491638580
                    &Signature=fOblaUZ8zy1m%2BNA44oPwHMeetfs%3D"
            }
          ]
        }
```

```
    ]
  },
  {
    "dataRangeStartTimeStamp": "2016-12-07T21:00:00.000Z",
    "dataRangeEndTimeStamp": "2016-12-07T21:59:59.999Z",
    "schemaUrl": "schema-url",
    "schemaVersion": "1.0",
    "entities": [
      {
        "entityName": "PAGE_ERRORS",
        "dataUrlDetails": [
          {
            "url": "https://discover-sample-data.s3.amazonaws.com/DWH/PART/PAGE_ERRORS/
                  month%3D12/day%3D7/hour%3D21/000000_0?x-amz-security-token=FQoDYXdzED
                  FSLEAiH7sT4isvVIe1YZuSKE0My0MqjTZo037pVtREGBE3hMS6DMz8xPoWG9AXT%2B5G3
                  I0peP7x88Vf8HkjHIqmKjbnC00MBf%2BWDOSfefAoqw%2BEVKtVKKf8nzLDmvUOGlio19
                  FazPIp%2Bv%2Fq6b3bJzo992VzKTLzT%2Bj%2FLDAkgkp7DdxCZNiN4TFi4Gdbu%2Bjvn
                  yAAcRmdpYPIG8A%2FXNG3zcCgABOE977kc16moLGjzLmDU94dSuaTXp42A4QW82DuYtsn
                  WVSyHH6fBcXV2IHb7W64p6hMEdwPTpQrP7ulW47ZYI5Wihr2u8j%2BotlzW2Qh6NJZiGN
                  sbU9ggV%2FGBgbu1oXMuUa9qSseRd7dNZvSj2%2BKHHBQ%3D%3D&AWSAccessKeyId=AS
                  &Expires=1491638580&Signature=TmUmMWbU4eT3xtOjsnGD2lDBmGo%3D"
          }
        ]
      },
      {
        "entityName": "PAGE_ERRORS_NEW",
        "dataUrlDetails": [
          {
            "url": "https://discover-sample-data.s3.amazonaws.com/DWH/PART/PAGE_ERRORS_
                  %3D2016/month%3D12/day%3D7/hour%3D21/000414_0.gz?x-amz-security-token
                  BvYDUGefSnzZDgxFSLEAiH7sT4isvVIe1YZuSKE0My0MqjTZo037pVtREGBE3hMS6DMz8
                  3M16j57%2B4XK%2FO4zI0peP7x88Vf8HkjHIqmKjbnC00MBf%2BWDOSfefAoqw%2BEVKt
                  lio19rNL%2Fj0M7BmNErLG4FazPIp%2Bv%2Fq6b3bJzo992VzKTLzT%2Bj%2FLDAkgkp7
                  dbu%2Bjvnd3clEduI3It%2B9plRyAAcRmdpYPIG8A%2FXNG3zcCgABOE977kc16moLGjz
                  2A4QW82DuYtsn1yR523NWZRNAmSjMmJWVSyHH6fBcXV2IHb7    W64p6hMEdwPTpQrP7
                  %2BotlzW2Qh6NJZiGNFf1R75mpAeyJ%2BKCQsbU9ggV%2FGBgbu1oXMuU    a9qSseRd
                  D%3D&AWSAccessKeyId=ASIAITIUAJX4NY74BQOA&Expires=1491638580
                  &Signature=fxOdfjAEBvXnbbT2ePmVbzjatPo%3D"
          }
        ]
      }
    ]
  },
  {
    "dataRangeStartTimeStamp": "2016-12-07T22:00:00.000Z",
    "dataRangeEndTimeStamp": "2016-12-07T22:59:59.999Z",
    "schemaUrl": "schema-url",
    "schemaVersion": "1.0",
    "entities": [
      {
        "entityName": "PAGE_ERRORS",
        "dataUrlDetails": [
          {
            "url": "https://discover-sample-data.s3.amazonaws.com/DWH/PART/PAGE_ERRORS/
                  %3D2016/month%3D12/day%3D7/hour%3D22/000000_0?x-amz-security-token=FQ
                  DBvYDUGefSnzZDgxFSLEAiH7sT4isvVIe1YZuSKE0My0MqjTZo037pVtREGBE3hMS6DMz
```

```
                %2B5G3M16j57%2B4XK%2FO4zI0peP7x88Vf8HkjHIqmKjbnC00MBf%2BWDOSfefAoqw%2
                nzLDmvUOGlio19rNL%2Fj0M7BmNErLG4FazPIp%2Bv%2Fq6b3bJzo992VzKTLzT%2Bj%2
                dxCZNiN4TFi4Gdbu%2Bjvnd3clEduI3It%2B9plRyAAcRmdpYPIG8A%2FXNG3zcCgABOE
                GjzLmDU94dSuaTXp42A4QW82DuYtsn1yR523NWZRNAmSjMmJ    WVSyHH6fBcXV2IHb7
                QrP7ulW47ZYI5Wihr2u8j%2BotlzW2Qh6NJZiGNFf1R75mpAeyJ%2BKCQ    sbU9ggV%
                9qSseRd7dNZvSj2%2BKHHBQ%3D%3D&AWSAccessKeyId=ASIAITIUAJX4NY74BQOA
                &Expires=1491638580&Signature=iNRapZhPu3k3L2snTV5KQhSh%2BTo%3D"
          }
        ]
      },
      {
        "entityName": "PAGE_ERRORS_NEW",
        "dataUrlDetails": [
          {
            "url": "https://discover-sample-data.s3.amazonaws.com/DWH/PART/PAGE_ERRORS_
                %3D2016/month%3D12/day%3D7/hour%3D22/000415_0.gz?x-amz-security-token
                BvYDUGefSnzZDgxFSLEAiH7sT4isvVIe1YZuSKE0My0MqjTZo037pVtREGBE3hMS6DMz8
                3M16j57%2B4XK%2FO4zI0peP7x88Vf8HkjHIqmKjbnC00MBf%2BWDOSfefAoqw%2BEVKt
                lio19rNL%2Fj0M7BmNErLG4FazPIp%2Bv%2Fq6b3bJzo992VzKTLzT%2Bj%2FLDAkgkp7
                dbu%2Bjvnd3clEduI3It%2B9plRyAAcRmdpYPIG8A%2FXNG3zcCgABOE977kc16moLGjz
                2A4QW82DuYtsn1yR523NWZRNAmSjMmJWVSyHH6fBcXV2IHb7W64p6hMEdwPTpQrP7ulW4
                2BotlzW2Qh6NJZiGNFf1R75mpAeyJ%2BKCQsbU9ggV%2FGBgbu1oXMuUa9qSseRd7dNZv
                %3D&AWSAccessKeyId=ASIAITIUAJX4NY74BQOA&Expires=1491638580
                &Signature=50P5QR22ZFVqwS0ycw2tWNgFygE%3D"
          }
        ]
      }
    ]
  },
  {
    "dataRangeStartTimeStamp": "2016-12-07T23:00:00.000Z",
    "dataRangeEndTimeStamp": "2016-12-07T23:59:59.999Z",
    "schemaUrl": "schema-url",
    "schemaVersion": "1.0",
    "entities": [
      {
        "entityName": "PAGE_ERRORS",
        "dataUrlDetails": [
          {
            "url": "https://discover-sample-data.s3.amazonaws.com/DWH/PART/PAGE_ERRORS/
                %3D2016/month%3D12/day%3D7/hour%3D23/000000_0?x-amz-security-token=FQ
                DBvYDUGefSnzZDgxFSLEAiH7sT4isvVIe1YZuSKE0My0MqjTZo037pVtREGBE3hMS6DMz
                %2B5G3M16j57%2B4XK%2FO4zI0peP7x88Vf8HkjHIqmKjbnC00MBf%2BWDOSfefAoqw%2
                nzLDmvUOGlio19rNL%2Fj0M7BmNErLG4FazPIp%2Bv%2Fq6b3bJzo992VzKTLzT%2Bj%2
                dxCZNiN4TFi4Gdbu%2Bjvnd3clEduI3It%2B9plRyAAcRmdpYPIG8A%2FXNG3zcCgABOE
                GjzLmDU94dSuaTXp42A4QW82DuYtsn1yR523NWZRNAmSjMmJ    WVSyHH6fBcXV2IHb7
                QrP7ulW47ZYI5Wihr2u8j%2BotlzW2Qh6NJZiGNFf1R75mpAeyJ%2BKCQ    sbU9ggV%
                9qSseRd7dNZvSj2%2BKHHBQ%3D%3D&AWSAccessKeyId=ASIAITIUAJX4NY74BQOA
                &Expires=1491638580&Signature=PQBfjhJgA0lu%2BPtKIHnSgLHYv%2Fs%3D"
          }
        ]
      },
      {
        "entityName": "PAGE_ERRORS_NEW",
        "dataUrlDetails": [
          {
```

```
          "url": "https://discover-sample-data.s3.amazonaws.com/DWH/PART/PAGE_ERRORS_
                %3D2016/month%3D12/day%3D7/hour%3D23/000416_0.gz?x-amz-security-token
                BvYDUGefSnzZDgxFSLEAiH7sT4isvVIe1YZuSKE0My0MqjTZo037pVtREGBE3hMS6DMz8
                3M16j57%2B4XK%2FO4zI0pePx88Vf8HkjHIqmKjbnC00MBf%2BWDOSfefAoqw%2BEVKtV
                io19rNL%2Fj0M7BmNErLG4FazPIp%2Bv%2Fq6b3bJzo992VzKTLzT%2Bj%2FLDAkgkp7D
                bu%2Bjvnd3clEduI3It%2B9plRyAAcRmdpYPIG8A%2FXNG3zcCgABOE977kc16moLGjzL
                A4QW82DuYtsn1yR523NWZRNAmSjMmJWVSyHH6fBcXV2IHb7W64p6hMEdwPTpQrP7ulW47
                BotlzW2Qh6NJZiGNFf1R75mpAeyJ%2BKCQsbU9ggV%2FGBgbu1oXMuUa9qSseRd7dNZvS
                3D&AWSAccessKeyId=ASIAITIUAJX4NY74BQOA&Expires=1491638580
                &Signature=eifTv8dCmR%2B3VcIiU%2Ft76%2BwuB2w%3D"
        }
      ]
    }
  ]
},
{
  "dataRangeStartTimeStamp": "2016-12-08T00:00:00.000Z",
  "dataRangeEndTimeStamp": "2016-12-08T00:59:59.999Z",
  "schemaUrl": "schema-url",
  "schemaVersion": "1.0",
  "entities": [
    {
      "entityName": "PAGE_ERRORS",
      "dataUrlDetails": [
        {
          "url": "https://discover-sample-data.s3.amazonaws.com/DWH/PART/PAGE_ERRORS/
                month%3D12/day%3D8/hour%3D0/000000_0?x-amz-security-token=FQoDYXdzED8
                SLEAiH7sT4isvVIe1YZuSKE0My0MqjTZo037pVtREGBE3hMS6DMz8xPoWG9AXT%2B5G3M
                0peP7x88Vf8HkjHIqmKjbnC00MBf%2BWDOSfefAoqw%2BEVKtVKKf8nzLDmvUOGlio19r
                azPIp%2Bv%2Fq6b3bJzo992VzKTLzT%2Bj%2FLDAkgkp7DdxCZNiN4TFi4Gdbu%2Bjvnd
                AAcRmdpYPIG8A%2FXNG3zcCgABOE977kc16moLGjzLmDU94dSuaTXp42A4QW82DuYtsn1
                VSyHH6fBcXV2IHb7W64p6hMEdwPTpQrP7ulW47ZYI5Wihr2u8j%2BotlzW2Qh6NJZiGNF
                bU9ggV%2FGBgbu1oXMuUa9qSseRd7dNZvSj2%2BKHHBQ%3D%3D&AWSAccessKeyId=ASI
                &Expires=1491638580&Signature=iZtjLqe%2FN5mMxqlicccc7%2BX6xk0%3D"
        }
      ]
    },
    {
      "entityName": "PAGE_ERRORS_NEW",
      "dataUrlDetails": [
        {
          "url": "https://discover-sample-data.s3.amazonaws.com/DWH/PART/PAGE_ERRORS_
                %3D2016/month%3D12/day%3D8/hour%3D0/000424_0.gz?x-amz-security-token=
                vYDUGefSnzZDgxFSLEAiH7sT4isvVIe1YZuSKE0My0MqjTZo037pVtREGBE3hMS6DMz8x
                M16j57%2B4XK%2FO4zI0peP7x88Vf8HkjHIqmKjbnC00MBf%2BWDOSfefAoqw%2BEVKtV
                io19rNL%2Fj0M7BmNErLG4FazPIp%2Bv%2Fq6b3bJzo992VzKTLzT%2Bj%2FLDAkgkp7D
                bu%2Bjvnd3clEduI3It%2B9plRyAAcRmdpYPIG8A%2FXNG3zcCgABOE977kc16moLGjzL
                A4QW82DuYtsn1yR523NWZRNAmSjMmJWVSyHH6fBcXV2IHb7W64p6hMEdwPTpQrP7ulW47
                BotlzW2Qh6NJZiGNFf1R75mpAeyJ%2BKCQsbU9ggV%2FGBgbu1oXMuUa9qSseRd7dNZvS
                3D&AWSAccessKeyId=ASIAITIUAJX4NY74BQOA&Expires=1491638580
                &Signature=ZvtZa%2B%2FXPFEWsV5d8fseH0pcWHo%3D"
        }
      ]
    }
  ]
},
```

```
{
  "dataRangeStartTimeStamp": "2016-12-08T01:00:00.000Z",
  "dataRangeEndTimeStamp": "2016-12-08T01:59:59.999Z",
  "schemaUrl": "schema-url",
  "schemaVersion": "1.0",
  "entities": [
    {
      "entityName": "PAGE_ERRORS",
      "dataUrlDetails": [
        {
          "url": "https://discover-sample-data.s3.amazonaws.com/DWH/PART/PAGE_ERRORS/
                month%3D12/day%3D8/hour%3D1/000000_0?x-amz-security-token=FQoDYXdzED8
                SLEAiH7sT4isvVIe1YZuSKE0My0MqjTZo037pVtREGBE3hMS6DMz8xPoWG9AXT%2B5G3M
                0peP7x88Vf8HkjHIqmKjbnC00MBf%2BWDOSfefAoqw%2BEVKtVKKf8nzLDmvUOGlio19r
                azPIp%2Bv%2Fq6b3bJzo992VzKTLzT%2Bj%2FLDAkgkp7DdxCZNiN4TFi4Gdbu%2Bjvnd
                AAcRmdpYPIG8A%2FXNG3zcCgABOE977kc16moLGjzLmDU94dSuaTXp42A4QW82DuYtsn1
                VSyHH6fBcXV2IHb7W64p6hMEdwPTpQrP7ulW47ZYI5Wihr2u8j%2BotlzW2Qh6NJZiGNF
                bU9ggV%2FGBgbu1oXMuUa9qSseRd7dNZvSj2%2BKHHBQ%3D%3D&AWSAccessKeyId=ASI
                &Expires=1491638580&Signature=3euMd6V9AhO9if9HXV5%2FgyJIq6U%3D"
        }
      ]
    },
    {
      "entityName": "PAGE_ERRORS_NEW",
      "dataUrlDetails": [
        {
          "url": "https://discover-sample-data.s3.amazonaws.com/DWH/PART/PAGE_ERRORS_
                %3D2016/month%3D12/day%3D8/hour%3D1/000425_0.gz?x-amz-security-token=
                vYDUGefSnzZDgxFSLEAiH7sT4isvVIe1YZuSKE0My0MqjTZo037pVtREGBE3hMS6DMz8x
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                io19rNL%2Fj0M7BmNErLG4FazPIp%2Bv%2Fq6b3bJzo992VzKTLzT%2Bj%2FLDAkgkp7D
                bu%2Bjvnd3clEduI3It%2B9plRyAAcRmdpYPIG8A%2FXNG3zcCgABOE977kc16moLGjzL
                A4QW82DuYtsn1yR523NWZRNAmSjMmJWVSyHH6fBcXV2IHb7W64p6hMEdwPTpQrP7ulW47
                BotlzW2Qh6NJZiGNFf1R75mpAeyJ%2BKCQsbU9ggV%2FGBgbu1oXMuUa9qSseRd7dNZvS
                3D&AWSAccessKeyId=ASIAITIUAJX4NY74BQOA&Expires=1491638580
                &Signature=kmxYB78phPBdafAYna%2Fpcz6V7%2FU%3D"
        }
      ]
    }
  ]
},
{
  "dataRangeStartTimeStamp": "2016-12-08T02:00:00.000Z",
  "dataRangeEndTimeStamp": "2016-12-08T02:59:59.999Z",
  "schemaUrl": "schema-url",
  "schemaVersion": "1.0",
  "entities": [
    {
      "entityName": "PAGE_ERRORS",
      "dataUrlDetails": [
        {
          "url": "https://discover-sample-data.s3.amazonaws.com/DWH/PART/PAGE_ERRORS/
                month%3D12/day%3D8/hour%3D2/000000_0?x-amz-security-token=FQoDYXdzED8
                SLEAiH7sT4isvVIe1YZuSKE0My0MqjTZo037pVtREGBE3hMS6DMz8xPoWG9AXT%2B5G3M
                0peP7x88Vf8HkjHIqmKjbnC00MBf%2BWDOSfefAoqw%2BEVKtVKKf8nzLDmvUOGlio19r
                azPIp%2Bv%2Fq6b3bJzo992VzKTLzT%2Bj%2FLDAkgkp7DdxCZNiN4TFi4Gdbu%2Bjvnd
```

```
                        AAcRmdpYPIG8A%2FXNG3zcCgABOE977kc16moLGjzLmDU94dSuaTXp42A4QW82DuYtsn1
                        VSyHH6fBcXV2IHb7W64p6hMEdwPTpQrP7ulW47ZYI5Wihr2u8j%2BotlzW2Qh6NJZiGNF
                        bU9ggV%2FGBgbu1oXMuUa9qSseRd7dNZvSj2%2BKHHBQ%3D%3D&AWSAccessKeyId=ASI
                        &Expires=1491638580&Signature=qYa%2FSwgS4YVHS0DaNjGOtQ%2FilDE%3D"
                }
              ]
            },
            {
              "entityName": "PAGE_ERRORS_NEW",
              "dataUrlDetails": [
                {
                  "url": "https://discover-sample-data.s3.amazonaws.com/DWH/PART/PAGE_ERRORS_
                        %3D2016/month%3D12/day%3D8/hour%3D2/000426_0.gz?x-amz-security-token=
                        vYDUGefSnzZDgxFSLEAiH7sT4isvVIe1YZuSKE0My0MqjTZo037pVtREGBE3hMS6DMz8x
                        M16j57%2B4XK%2FO4zI0peP7x88Vf8HkjHIqmKjbnC00MBf%2BWDOSfef    Aoqw%2BE
                        io19rNL%2Fj0M7BmNErLG4FazPIp%2Bv%2Fq6b3bJzo992VzKTLzT%2Bj%2FLDAkgkp7D
                        bu%2Bjvnd3clEduI3It%2B9plRyAAcRmdpYPIG8A%2FXNG3zcCgABOE977kc16moLGjzL
                        A4QW82DuYtsn1yR523NWZRNAmSjMmJWVSyHH6fBcXV2IHb7W64p6hMEdwPTpQrP7ulW47
                        BotlzW2Qh6NJZiGNFf1R75mpAeyJ%2B    KCQsbU9ggV%2FGBgbu1oXMuUa9qSseRd7d
                        3D&AWSAccessKeyId=ASIAITIUAJX4NY74BQOA&Expires=1491638580
                        &Signature=ZwBED8VaxUsFxkZiHPHrJpzDMZI%3D"
                }
              ]
            }
          ]
        },
        {
          "dataRangeStartTimeStamp": "2016-12-08T03:00:00.000Z",
          "dataRangeEndTimeStamp": "2016-12-08T03:59:59.999Z",
          "schemaUrl": "schema-url",
          "schemaVersion": "1.0",
          "entities": [
            {
              "entityName": "PAGE_ERRORS",
              "dataUrlDetails": [
                {
                  "url": "https://discover-sample-data.s3.amazonaws.com/DWH/PART/PAGE_ERRORS/
                        month%3D12/day%3D8/hour%3D3/000000_0?x-amz-security-token=FQoDYXdzED8
                        SLEAiH7sT4isvVIe1YZuSKE0My0MqjTZo037pVtREGBE3hMS6DMz8xPoWG9AXT%2B5G3M
                        0peP7x88Vf8HkjHIqmKjbnC00MBf%2BWDOSfefAoqw%2BEVKtVKKf8nzLDmvUOGlio19r
                        azPIp%2Bv%2Fq6b3bJzo992VzKTLzT%2Bj%2FLDAkgkp7DdxCZNiN4TFi4Gdbu%2Bjvnd
                        AAcRmdpYPIG8A%2FXNG3zcCgABOE977kc16moLGjzLmDU94dSuaTXp42A4QW82DuYtsn1
                        VSyHH6fBcXV2IHb7W64p6hMEdwPTpQrP7ulW47ZYI5Wihr2u8j%2BotlzW2Qh6NJZiGNF
                        bU9ggV%2FGBgbu1oXMuUa9qSseRd7dNZvSj2%2BKHHBQ%3D%3D&AWSAccessKeyId=ASI
                        &Expires=1491638580&Signature=%2FtjlFEF%2FZBtqnhPFrvmkivR64vE%3D"
                }
              ]
            },
            {
              "entityName": "PAGE_ERRORS_NEW",
              "dataUrlDetails": [
                {
                  "url": "https://discover-sample-data.s3.amazonaws.com/DWH/PART/PAGE_ERRORS_
                        %3D2016/month%3D12/day%3D8/hour%3D3/000427_0.gz?x-amz-security-token=
                        vYDUGefSnzZDgxFSLEAiH7sT4isvVIe1YZuSKE0My0MqjTZo037pVtREGBE3hMS6DMz8x
                        M16j57%2B4XK%2FO4zI0peP7x88Vf8HkjHIqmKjbnC00MBf%2BWDOSfefAoqw%2BEVKtV
```

```
                    io19rNL%2Fj0M7BmNErLG4FazPIp%2Bv%2Fq6b3bJzo992VzKTLzT%2Bj%2FLDAkgkp7D
                    bu%2Bjvnd3clEduI3It%2B9plRyAAcRmdpYPIG8A%2FXNG3zcCgABOE977kc16moLGjzL
                    A4QW82DuYtsn1yR523NWZRNAmSjMmJWVSyHH6fBcXV2IHb7W64p6hMEdwPTpQrP7ulW47
                    BotlzW2Qh6NJZiGNFf1R75mpAeyJ%2BKCQsbU9ggV%2FGBgbu1oXMuUa9qSseRd7dNZvS
                    3D&AWSAccessKeyId=ASIAITIUAJX4NY74BQOA&Expires=1491638580
                    &Signature=5lnlIAbBXbtY4iIYAJpI%2Fge6wng%3D"
                }
              ]
            }
          ]
        },
        {
          "dataRangeStartTimeStamp": "2016-12-08T04:00:00.000Z",
          "dataRangeEndTimeStamp": "2016-12-08T04:59:59.999Z",
          "schemaUrl": "schema-url",
          "schemaVersion": "1.0",
          "entities": [
            {
              "entityName": "PAGE_ERRORS",
              "dataUrlDetails": [
                {
                  "url": "https://discover-sample-data.s3.amazonaws.com/DWH/PART/PAGE_ERRORS/
                    month%3D12/day%3D8/hour%3D4/000000_0?x-amz-security-token=FQoDYXdzED8
                    SLEAiH7sT4isvVIe1YZuSKE0My0MqjTZo037pVtREGBE3hMS6DMz8xPoWG9AXT%2B5G3M
                    0peP7x88Vf8HkjHIqmKjbnC00MBf%2BWDOSfefAoqw%2BEVKtVKKf8nzLDmvUOGlio19r
                    azPIp%2Bv%2Fq6b3bJzo992VzKTLzT%2Bj%2FLDAkgkp7DdxCZNiN4TFi4Gdbu%2Bjvnd
                    AAcRmdpYPIG8A%2FXNG3zcCgABOE977kc16moLGjzLmDU94dSuaTXp42A4QW82DuYtsn1
                    VSyHH6fBcXV2IHb7W64p6hMEdwPTpQrP7ulW47ZYI5Wihr2u8j%2BotlzW2Qh6NJZiGNF
                    bU9ggV%2FGBgbu1oXMuUa9qSseRd7dNZvSj2%2BKHHBQ%3D%3D&AWSAccessKeyId=ASI
                    &Expires=1491638580&Signature=ua5eAxq4gWukAfjcghoO0iaEuWs%3D"
                }
              ]
            },
            {
              "entityName": "PAGE_ERRORS_NEW",
              "dataUrlDetails": [
                {
                  "url": "https://discover-sample-data.s3.amazonaws.com/DWH/PART/PAGE_ERRORS_
                    %3D2016/month%3D12/day%3D8/hour%3D4/000428_0.gz?x-amz-security-token=
                    vYDUGefSnzZDgxFSLEAiH7sT4isvVIe1YZuSKE0My0MqjTZo037pVtREGBE3hMS6DMz8x
                    M16j57%2B4XK%2FO4zI0peP7x88Vf8HkjHIqmKjbnC00MBf%2BWDOSfefAoqw%2BEVKtV
                    io19rNL%2Fj0M7BmNErLG4FazPIp%2Bv%2Fq6b3bJzo992VzKTLzT%2Bj%2FLDAkgkp7D
                    bu%2Bjvnd3clEduI3It%2B9plRyAAcRmdpYPIG8A%2FXNG3zcCgABOE977kc16moLGjzL
                    A4QW82DuYtsn1yR523NWZRNAmSjMmJWVSyHH6fBcXV2IHb7W64p6hMEdwPTpQrP7ulW47
                    BotlzW2Qh6NJZiGNFf1R75mpAeyJ%2BKCQsbU9ggV%2FGBgbu1oXMuUa9qSseRd7dNZvS
                    3D&AWSAccessKeyId=ASIAITIUAJX4NY74BQOA&Expires=1491638580
                    &Signature=f3lyv23VSWoT7lCazCypKT%2BYYcE%3D"
                }
              ]
            }
          ]
        }
      ],
      "limit": 10,
      "version": 2
    }
```

The response contains these entityName items:

- BUSINESS_PROCESS_DETAILS
- BUSINESS_PROCESS_DETAILS_EXT
- CART_ACTIVITY_DETAILS
- CART_ACTIVITY_DETAILS_EXT
- CUSTOM_ATTRIBUTES
- DOCUMENT_DETAILS
- FORM_DETAILS
- GOAL_DETAILS
- GOAL_DETAILS_EXT
- MEDIA_ACTIVITY_DETAILS
- MEDIA_DETAILS
- MEDIA_DETAILS_EXT
- ORDER DETAILS
- ORDER_SUMMARY
- PAGE_DETAILS
- PAGE_DETAILS_EXT
- PAGE_ERRORS
- PRODUCT_VIEWS
- PROMOTION_DISPLAYED
- PROMOTION_USED
- SEARCH_RESULTS
- SEARCH_RESULTS_EXT
- SESSION_DETAILS
- SESSION_DETAILS_EXT
- VISIT_DETAILS

The output contains these links:

Table 64.4 Links in REST Response

Name	Description
Link to self	Specifies that the start is 0 and the limit of every page is 20 by default
Next page	A link for accessing the next page with a start and limit
Previous link	A link for accessing the previous page with a start and limit
Last page	A link that represents a link to the last page with a start and limit

Name	Description
Resets	A link for accessing data for reprocessed date ranges
Schema version	The schema version. The default value is 1.

Note: To use links in the REST response, copy the link from the output. Then, append the actual value for the SAS Customer Intelligence 360 Download API, the generated JWT, and the access point to the URL string. Submit this new string as the REST call.

- Start: start of the record
- Count: total number of records

There are a number of items based on the limit set. Each item consists of the following parameters:

Table 64.5 *Download Partitioned Detail Data*

Parameter	Description
dataRangeStartTimeStamp	The start date of the range for which the data must be downloaded.
dataRangeEndTimeStamp	The end date of the range for which the data must be downloaded.
schemaUrl	Metadata for all subject areas.
entityName	The subject area for the link that is provided.
dataUrlDetails	The link to data for the given range of entities. There can be multiple URLs for the same entity depending on the number of files available. The <*filename*>.gz file is downloaded after a user clicks the URL.

You can browse for the next records by clicking **Next page**. By default, the API provides links to all data available in the system in case you need to download data from an additional date parameter (for example, by dataRangeStartTimeStamp).

The new SAS Customer Intelligence 360 Streaming Data Platform now enables data to be available for download in 10-minute intervals. If the API calls are not being changed from those used previously, there will be six URLs available per table per hour in the API response. The response looks similar to this example:

```
{
    "links": [
        {
            "method": "GET",
            "rel": "self",
            "href": "http://datahubDiscoverService-dhubtest.cidev.sas.us:8080/SASWebMarke
                    Service/rest/dataDownload/eventData/detail/partitionedData?tenantId=1
```

```
                =1000&dataRang    eStartTimeStamp=2018-08-02T05:00:00Z&dataRangeEndTi
                59:59Z&subHourlyDataRangeInMinutes=10&includeAllHourStatus=true",uri"
                gDiscoverService/rest/dataDownload/eventData/detail/partitionedData?t
                t=0&limit=1000&dataRangeStartTimeStamp=2018-08-02T05:00:00Z&dataRange
                08-02T06:59:59Z&subHourlyDataRangeInMinutes=10&includeAllHourStatus=t
    }
],
"accept": "application/json application/xml",
"start": 0,
"count": 12,
"items": [
    {
        "dataRangeStartTimeStamp": "2018-08-02T05:00:00.000Z",
        "dataRangeEndTimeStamp": "2018-08-02T05:09:59.999Z",
        "schemaVersion": "1.0",
        "entities": [],
        "dataRangeProcessingStatus": "NO_DATA"
    },
    {
        "dataRangeStartTimeStamp": "2018-08-02T05:10:00.000Z",
        "dataRangeEndTimeStamp": "2018-08-02T05:19:59.999Z",
        "schemaVersion": "1.0",
        "entities": [],
        "dataRangeProcessingStatus": "NO_DATA"
    },
    {
        "dataRangeStartTimeStamp": "2018-08-02T05:20:00.000Z",
        "dataRangeEndTimeStamp": "2018-08-02T05:29:59.999Z",
        "schemaVersion": "1.0",
        "entities": [],
        "dataRangeProcessingStatus": "NO_DATA"
    },
    {
        "dataRangeStartTimeStamp": "2018-08-02T05:30:00.000Z",
        "dataRangeEndTimeStamp": "2018-08-02T05:39:59.999Z",
        "schemaVersion": "1.0",
        "entities": [],
        "dataRangeProcessingStatus": "NO_DATA"
    },
    {
        "dataRangeStartTimeStamp": "2018-08-02T05:40:00.000Z",
        "dataRangeEndTimeStamp": "2018-08-02T05:49:59.999Z",
        "schemaVersion": "1.0",
        "entities": [],
        "dataRangeProcessingStatus": "NO_DATA"
    },
    {
        "dataRangeStartTimeStamp": "2018-08-02T05:50:00.000Z",
        "dataRangeEndTimeStamp": "2018-08-02T05:59:59.999Z",
        "schemaVersion": "1.0",
        "entities": [],
        "dataRangeProcessingStatus": "NO_DATA"
    },
    {
        "dataRangeStartTimeStamp": "2018-08-02T06:00:00.000Z",
        "dataRangeEndTimeStamp": "2018-08-02T06:09:59.999Z",
```

```
"schemaUrl": "https://ci-360-deployment-dev-us-east-1.s3.amazonaws.com/CodeDe
        p-dhubtest1811/discover/metadata/detail_schema_v1.json?X-Amz-Security
        XdzECkaDOonrkL528tYbjBoGyK3A84jJrvcg0GwQdDNi60mf20dbmNV5rYAQNzvpxkhIt
        8RoxedrOizN844a5jPhUqB8OvBsn%2BziswxiJ32%2BaS2ByKDplfEqJ%2BME1X0d1810
        6PzL0Q56B7YusoT5Q4h%2FJ7MokbpgZZP25RLSt51SWBT072wqaoIu8AHwXnDsYKUtxA9
        I1C5AMxUsg5mDG%2Bs%2FUe2qVEnHnDkI5gehJSGpwgw5p%2F5JdHsv55lyqkVw%2F7%2
        TY4ayQWANtxw3%2FrAB9d%2FuWX%2BdTFRjOUVazDZHdvtMT5QGC9WNppqEOuc9DGApR7
        ynStrvNAyG4APnJqR2GPQh99czJHTimZ79p7O%2ByHAHeF%2F1rzYZPfOynB30r11rJ2g
        %2BZa0yhVQ7ArYa71qi%2B6%2BLGHvHa0njwQesWYWXDrQGtJB1QkPPMCUyRIucCwRPmK
        OAMyPaqZaK8JwxTQHGR2H%2BFieFnwbe3mPLo2mMjdchkSjWipMZY1Ufz6gotr352wU%3
        m=AWS4-HMAC-SHA256&X-Amz-Date=20180823T082914Z&X-Amz-SignedHeaders=ho
        =3600&X-Amz-Credential=ASIA53RBKAC2WDHIGR6W%2F20180823%2Fus-east-1%2F
        t&X-Amz-Signature=67dca8a723f28f47a9e55c2832d2155c52c32c4d85861759f88
"schemaVersion": "1.0",
"entities": [
    {
        "entityName": "PAGE_DETAILS",
        "dataUrlDetails": [
            {
                "url": "https://ci-360-datahub-data-dev-us-east-1.s3.amazonaw
        f04fcd5f4e659168902b0fdc7dd4/dfs/data/detail/PAGE_DETAILS/datekey%3D2
        3189600000_PAGE_DETAILS_d179e912-9660-4b3a-b103-6814559e2160.gz?X-Amz
        FQoGZXIvYXdzECkaDOonrkL528tYbjBoGyK3A84jJrvcg0GwQdDNi60mf20dbmNV5rYAQ
        OJt0nDLzx8RoxedrOizN844a5jPhUqB8OvBsn%2BziswxiJ32%2BaS2ByKDplfEqJ%2BM
        w5JH36HlP6PzL0Q56B7YusoT5Q4h%2FJ7MokbpgZZP25RLSt51SWBT072wqaoIu8AHwXn
        zz73BtTTQI1C5AMxUsg5mDG%2Bs%2FUe2qVEnHnDkI5gehJSGpwgw5p%2F5JdHsv55lyq
        ikPqAFiZXTY4ayQWANtxw3%2FrAB9d%2FuWX%2BdTFRjOUVazDZHdvtMT5QGC9WNppqEO
        jZEUCSizWynStrvNAyG4APnJqR2GPQh99czJHTimZ79p7O%2ByHAHeF%2F1rzYZPfOynB
        r8Z7f5DRw%2BZa0yhVQ7ArYa71qi%2B6%2BLGHvHa0njwQesWYWXDrQGtJB1QkPPMCUyR
        e5%2FiTuoOAMyPaqZaK8JwxTQHGR2H%2BFieFnwbe3mPLo2mMjdchkSjWipMZY1Ufz6go
        -Algorithm=AWS4-HMAC-SHA256&X-Amz-Date=20180823T082914Z&X-Amz-SignedH
        z-Expires=3599&X-Amz-Credential=ASIA53RBKAC2WDHIGR6W%2F20180823%2Fus-
        s4_request&X-Amz-Signature=cf8b065395bd28bfa7acca86d7bbddb7440cfd5b7f
        f0013c"
            }
        ]
    },
    {
        "entityName": "PAGE_DETAILS_EXT",
        "dataUrlDetails": [
            {
                "url": "https://ci-360-datahub-data-dev-us-east-1.s3.amazonaw
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    OJt0nDLzx8RoxedrOizN844a5jPhUqB8OvBsn%2BziswxiJ32%2BaS2ByKDplfEqJ%2BM
    w5JH36HlP6PzL0Q56B7YusoT5Q4h%2FJ7MokbpgZZP25RLSt51SWBT072wqaoIu8AHwXn
    zz73BtTTQI1C5AMxUsg5mDG%2Bs%2FUe2qVEnHnDkI5gehJSGpwgw5p%2F5JdHsv55lyg
    ikPqAFiZXTY4ayQWANtxw3%2FrAB9d%2FuWX%2BdTFRjOUVazDZHdvtMT5QGC9WNppqEC
    jZEUCSizWynStrvNAyG4APnJqR2GPQh99czJHTimZ79p7O%2ByHAHeF%2F1rzYZPfOynE
    r8Z7f5DRw%2BZa0yhVQ7ArYa71qi%2B6%2BLGHvHa0njwQesWYWXDrQGtJB1QkPPMCUyR
    e5%2FiTuoOAMyPaqZaK8JwxTQHGR2H%2BFieFnwbe3mPLo2mMjdchkSjWipMZY1Ufz6gc
    -Algorithm=AWS4-HMAC-SHA256&X-Amz-Date=20180823T082914Z&X-Amz-SignedH
    z-Expires=3600&X-Amz-Credential=ASIA53RBKAC2WDHIGR6W%2F20180823%2Fus-
    s4_request&X-Amz-Signature=097f0592e8cd49b74b34048af7bd56979fd461275a
    aa06b0"
        }
    ]
},
{
    "entityName": "ORDER_SUMMARY",
    "dataUrlDetails": [
        {
            "url": "https://ci-360-datahub-data-dev-us-east-1.s3.amazonaw
```

```
    f04fcd5f4e659168902b0fdc7dd4/dfs/data/detail/ORDER_SUMMARY/datekey%3D
    3192000000_ORDER_SUMMARY_25ad97c6-6bab-482d-97b4-d11c82a611a7.gz?X-Am
    FQoGZXIvYXdzECkaDOonrkL528tYbjBoGyK3A84jJrvcg0GwQdDNi60mf20dbmNV5rYAQ
    OJt0nDLzx8RoxedrOizN844a5jPhUqB8OvBsn%2BziswxiJ32%2BaS2ByKDplfEqJ%2BM
    w5JH36HlP6PzL0Q56B7YusoT5Q4h%2FJ7MokbpgZZP25RLSt51SWBT072wqaoIu8AHwXn
    zz73BtTTQI1C5AMxUsg5mDG%2Bs%2FUe2qVEnHnDkI5gehJSGpwgw5p%2F5JdHsv55lyg
    ikPqAFiZXTY4ayQWANtxw3%2FrAB9d%2FuWX%2BdTFRjOUVazDZHdvtMT5QGC9WNppqEC
    jZEUCSizWynStrvNAyG4APnJqR2GPQh99czJHTimZ79p7O%2ByHAHeF%2F1rzYZPfOynE
    r8Z7f5DRw%2BZa0yhVQ7ArYa71qi%2B6%2BLGHvHa0njwQesWYWXDrQGtJB1QkPPMCUyR
    e5%2FiTuoOAMyPaqZaK8JwxTQHGR2H%2BFieFnwbe3mPLo2mMjdchkSjWipMZY1Ufz6gc
    -Algorithm=AWS4-HMAC-SHA256&X-Amz-Date=20180823T082914Z&X-Amz-SignedH
    z-Expires=3600&X-Amz-Credential=ASIA53RBKAC2WDHIGR6W%2F20180823%2Fus-
    s4_request&X-Amz-Signature=8b1d34f2bd473124aa48857b611806af1f85e738be
    408a82"
        }
    ]
},
{
    "entityName": "PAGE_DETAILS",
    "dataUrlDetails": [
        {
            "url": "https://ci-360-datahub-data-dev-us-east-1.s3.amazonaw
    f04fcd5f4e659168902b0fdc7dd4/dfs/data/detail/PAGE_DETAILS/datekey%3D2
    3192000000_PAGE_DETAILS_410e3729-3bb5-4e25-a3a6-cdff61cf62e2.gz?X-Amz
    FQoGZXIvYXdzECkaDOonrkL528tYbjBoGyK3A84jJrvcg0GwQdDNi60mf20dbmNV5rYAQ
    OJt0nDLzx8RoxedrOizN844a5jPhUqB8OvBsn%2BziswxiJ32%2BaS2ByKDplfEqJ%2BM
    w5JH36HlP6PzL0Q56B7YusoT5Q4h%2FJ7MokbpgZZP25RLSt51SWBT072wqaoIu8AHwXn
    zz73BtTTQI1C5AMxUsg5mDG%2Bs%2FUe2qVEnHnDkI5gehJSGpwgw5p%2F5JdHsv55lyg
    ikPqAFiZXTY4ayQWANtxw3%2FrAB9d%2FuWX%2BdTFRjOUVazDZHdvtMT5QGC9WNppqEC
    jZEUCSizWynStrvNAyG4APnJqR2GPQh99czJHTimZ79p7O%2ByHAHeF%2F1rzYZPfOynE
    r8Z7f5DRw%2BZa0yhVQ7ArYa71qi%2B6%2BLGHvHa0njwQesWYWXDrQGtJB1QkPPMCUyR
    e5%2FiTuoOAMyPaqZaK8JwxTQHGR2H%2BFieFnwbe3mPLo2mMjdchkSjWipMZY1Ufz6gc
    -Algorithm=AWS4-HMAC-SHA256&X-Amz-Date=20180823T082914Z&X-Amz-SignedH
    z-Expires=3600&X-Amz-Credential=ASIA53RBKAC2WDHIGR6W%2F20180823%2Fus-
    s4_request&X-Amz-Signature=492751c0ff6780e063cdfb27824eb65b5faff3d66e
    2b1318"
        }
    ]
},
{
    "entityName": "PAGE_DETAILS_EXT",
    "dataUrlDetails": [
        {
            "url": "https://ci-360-datahub-data-dev-us-east-1.s3.amazonaw
    f04fcd5f4e659168902b0fdc7dd4/dfs/data/detail/PAGE_DETAILS_EXT/datekey
    3192000000_PAGE_DETAILS_EXT_c735f501-a804-447c-b3d2-7be1afc32cc5.gz?X
    FQoGZXIvYXdzECkaDOonrkL528tYbjBoGyK3A84jJrvcg0GwQdDNi60mf20dbmNV5rYAQ
    OJt0nDLzx8RoxedrOizN844a5jPhUqB8OvBsn%2BziswxiJ32%2BaS2ByKDplfEqJ%2BM
    w5JH36HlP6PzL0Q56B7YusoT5Q4h%2FJ7MokbpgZZP25RLSt51SWBT072wqaoIu8AHwXn
    zz73BtTTQI1C5AMxUsg5mDG%2Bs%2FUe2qVEnHnDkI5gehJSGpwgw5p%2F5JdHsv55lyg
    ikPqAFiZXTY4ayQWANtxw3%2FrAB9d%2FuWX%2BdTFRjOUVazDZHdvtMT5QGC9WNppqEC
    jZEUCSizWynStrvNAyG4APnJqR2GPQh99czJHTimZ79p7O%2ByHAHeF%2F1rzYZPfOynE
    r8Z7f5DRw%2BZa0yhVQ7ArYa71qi%2B6%2BLGHvHa0njwQesWYWXDrQGtJB1QkPPMCUyR
    e5%2FiTuoOAMyPaqZaK8JwxTQHGR2H%2BFieFnwbe3mPLo2mMjdchkSjWipMZY1Ufz6gc
    -Algorithm=AWS4-HMAC-SHA256&X-Amz-Date=20180823T082914Z&X-Amz-SignedH
    z-Expires=3600&X-Amz-Credential=ASIA53RBKAC2WDHIGR6W%2F20180823%2Fus-
```

```
    s4_request&X-Amz-Signature=f7c5beafb55acd943b27f572523e1561384d8dcb20
    7bd075"
        }
    ]
},
{
    "entityName": "PAGE_ERRORS",
    "dataUrlDetails": [
        {
            "url": "https://ci-360-datahub-data-dev-us-east-1.s3.amazonaw
    f04fcd5f4e659168902b0fdc7dd4/dfs/data/detail/PAGE_ERRORS/datekey%3D20
    3192000000_PAGE_ERRORS_25b4b80f-8b19-4e5f-9ba8-5dc6d5b3fcc6.gz?X-Amz-
    FQoGZXIvYXdzECkaDOonrkL528tYbjBoGyK3A84jJrvcg0GwQdDNi60mf20dbmNV5rYAQ
    OJt0nDLzx8RoxedrOizN844a5jPhUqB8OvBsn%2BziswxiJ32%2BaS2ByKDplfEqJ%2BM
    w5JH36HlP6PzL0Q56B7YusoT5Q4h%2FJ7MokbpgZZP25RLSt51SWBT072wqaoIu8AHwXn
    zz73BtTTQI1C5AMxUsg5mDG%2Bs%2FUe2qVEnHnDkI5gehJSGpwgw5p%2F5JdHsv55lyg
    ikPqAFiZXTY4ayQWANtxw3%2FrAB9d%2FuWX%2BdTFRjOUVazDZHdvtMT5QGC9WNppqEC
    jZEUCSizWynStrvNAyG4APnJqR2GPQh99czJHTimZ79p7O%2ByHAHeF%2F1rzYZPfOynE
    r8Z7f5DRw%2BZa0yhVQ7ArYa71qi%2B6%2BLGHvHa0njwQesWYWXDrQGtJB1QkPPMCUyR
    e5%2FiTuoOAMyPaqZaK8JwxTQHGR2H%2BFieFnwbe3mPLo2mMjdchkSjWipMZY1Ufz6gc
    -Algorithm=AWS4-HMAC-SHA256&X-Amz-Date=20180823T082914Z&X-Amz-SignedH
    z-Expires=3600&X-Amz-Credential=ASIA53RBKAC2WDHIGR6W%2F20180823%2Fus-
    s4_request&X-Amz-Signature=9ac83428711e362a9d9b63be12b0d0a769e36e218b
    60ded9"
        }
    ]
},
{
    "entityName": "PRODUCT_VIEWS",
    "dataUrlDetails": [
        {
            "url": "https://ci-360-datahub-data-dev-us-east-1.s3.amazonaw
    f04fcd5f4e659168902b0fdc7dd4/dfs/data/detail/PRODUCT_VIEWS/datekey%3D
    3192000000_PRODUCT_VIEWS_0a4f031a-cc7e-414c-9c45-e493fb37a25a.gz?X-Am
    FQoGZXIvYXdzECkaDOonrkL528tYbjBoGyK3A84jJrvcg0GwQdDNi60mf20dbmNV5rYAQ
    OJt0nDLzx8RoxedrOizN844a5jPhUqB8OvBsn%2BziswxiJ32%2BaS2ByKDplfEqJ%2BM
    w5JH36HlP6PzL0Q56B7YusoT5Q4h%2FJ7MokbpgZZP25RLSt51SWBT072wqaoIu8AHwXn
    zz73BtTTQI1C5AMxUsg5mDG%2Bs%2FUe2qVEnHnDkI5gehJSGpwgw5p%2F5JdHsv55lyg
    ikPqAFiZXTY4ayQWANtxw3%2FrAB9d%2FuWX%2BdTFRjOUVazDZHdvtMT5QGC9WNppqEC
    jZEUCSizWynStrvNAyG4APnJqR2GPQh99czJHTimZ79p7O%2ByHAHeF%2F1rzYZPfOynE
    r8Z7f5DRw%2BZa0yhVQ7ArYa71qi%2B6%2BLGHvHa0njwQesWYWXDrQGtJB1QkPPMCUyR
    e5%2FiTuoOAMyPaqZaK8JwxTQHGR2H%2BFieFnwbe3mPLo2mMjdchkSjWipMZY1Ufz6gc
    -Algorithm=AWS4-HMAC-SHA256&X-Amz-Date=20180823T082914Z&X-Amz-SignedH
    z-Expires=3600&X-Amz-Credential=ASIA53RBKAC2WDHIGR6W%2F20180823%2Fus-
    s4_request&X-Amz-Signature=c16e7330d302c08fcb16ed7f71f7ad11e24157fc2f
    4a058b"
        }
    ]
},
{
    "entityName": "SESSION_DETAILS",
    "dataUrlDetails": [
        {
            "url": "https://ci-360-datahub-data-dev-us-east-1.s3.amazonaw
    f04fcd5f4e659168902b0fdc7dd4/dfs/data/detail/SESSION_DETAILS/datekey%
    3192000000_SESSION_DETAILS_ba6e9762-8280-4b5b-8a38-5b2dcd36c29f.gz?X-
```

```
    FQoGZXIvYXdzECkaDOonrkL528tYbjBoGyK3A84jJrvcg0GwQdDNi60mf20dbmNV5rYAQ
    OJt0nDLzx8RoxedrOizN844a5jPhUqB8OvBsn%2BziswxiJ32%2BaS2ByKDplfEqJ%2BM
    w5JH36HlP6PzL0Q56B7YusoT5Q4h%2FJ7MokbpgZZP25RLSt51SWBT072wqaoIu8AHwXn
    zz73BtTTQI1C5AMxUsg5mDG%2Bs%2FUe2qVEnHnDkI5gehJSGpwgw5p%2F5JdHsv55lyg
    ikPqAFiZXTY4ayQWANtxw3%2FrAB9d%2FuWX%2BdTFRjOUVazDZHdvtMT5QGC9WNppqEC
    jZEUCSizWynStrvNAyG4APnJqR2GPQh99czJHTimZ79p7O%2ByHAHeF%2F1rzYZPfOynB
    r8Z7f5DRw%2BZa0yhVQ7ArYa71qi%2B6%2BLGHvHa0njwQesWYWXDrQGtJB1QkPPMCUyR
    e5%2FiTuoOAMyPaqZaK8JwxTQHGR2H%2BFieFnwbe3mPLo2mMjdchkSjWipMZY1Ufz6gc
    -Algorithm=AWS4-HMAC-SHA256&X-Amz-Date=20180823T082914Z&X-Amz-SignedH
    z-Expires=3600&X-Amz-Credential=ASIA53RBKAC2WDHIGR6W%2F20180823%2Fus-
    s4_request&X-Amz-Signature=c2ad9f11fd47b707da0da10b9551f150d8f2b4aed5
    d02a23"
        }
    ]
},
{
    "entityName": "SESSION_DETAILS_EXT",
    "dataUrlDetails": [
        {
            "url": "https://ci-360-datahub-data-dev-us-east-1.s3.amazonaw
    f04fcd5f4e659168902b0fdc7dd4/dfs/data/detail/SESSION_DETAILS_EXT/date
    3192000000_SESSION_DETAILS_EXT_6837072e-762d-4a4f-aa60-43908371b2fa.g
    FQoGZXIvYXdzECkaDOonrkL528tYbjBoGyK3A84jJrvcg0GwQdDNi60mf20dbmNV5rYAQ
    OJt0nDLzx8RoxedrOizN844a5jPhUqB8OvBsn%2BziswxiJ32%2BaS2ByKDplfEqJ%2BM
    w5JH36HlP6PzL0Q56B7YusoT5Q4h%2FJ7MokbpgZZP25RLSt51SWBT072wqaoIu8AHwXn
    zz73BtTTQI1C5AMxUsg5mDG%2Bs%2FUe2qVEnHnDkI5gehJSGpwgw5p%2F5JdHsv55lyg
    ikPqAFiZXTY4ayQWANtxw3%2FrAB9d%2FuWX%2BdTFRjOUVazDZHdvtMT5QGC9WNppqEC
    jZEUCSizWynStrvNAyG4APnJqR2GPQh99czJHTimZ79p7O%2ByHAHeF%2F1rzYZPfOynB
    r8Z7f5DRw%2BZa0yhVQ7ArYa71qi%2B6%2BLGHvHa0njwQesWYWXDrQGtJB1QkPPMCUyR
    e5%2FiTuoOAMyPaqZaK8JwxTQHGR2H%2BFieFnwbe3mPLo2mMjdchkSjWipMZY1Ufz6gc
    -Algorithm=AWS4-HMAC-SHA256&X-Amz-Date=20180823T082914Z&X-Amz-SignedH
    z-Expires=3599&X-Amz-Credential=ASIA53RBKAC2WDHIGR6W%2F20180823%2Fus-
    s4_request&X-Amz-Signature=d60e388341fa45fc446c2663327a4f68f79f31035f
    94b3e7"
        }
    ]
},
{
    "entityName": "VISIT_DETAILS",
    "dataUrlDetails": [
        {
            "url": "https://ci-360-datahub-data-dev-us-east-1.s3.amazonaw
    f04fcd5f4e659168902b0fdc7dd4/dfs/data/detail/VISIT_DETAILS/datekey%3D
    3192000000_VISIT_DETAILS_63c3c67e-e924-421c-b7e2-b7faa1439b15.gz?X-Am
    FQoGZXIvYXdzECkaDOonrkL528tYbjBoGyK3A84jJrvcg0GwQdDNi60mf20dbmNV5rYAQ
    OJt0nDLzx8RoxedrOizN844a5jPhUqB8OvBsn%2BziswxiJ32%2BaS2ByKDplfEqJ%2BM
    w5JH36HlP6PzL0Q56B7YusoT5Q4h%2FJ7MokbpgZZP25RLSt51SWBT072wqaoIu8AHwXn
    zz73BtTTQI1C5AMxUsg5mDG%2Bs%2FUe2qVEnHnDkI5gehJSGpwgw5p%2F5JdHsv55lyg
    ikPqAFiZXTY4ayQWANtxw3%2FrAB9d%2FuWX%2BdTFRjOUVazDZHdvtMT5QGC9WNppqEC
    jZEUCSizWynStrvNAyG4APnJqR2GPQh99czJHTimZ79p7O%2ByHAHeF%2F1rzYZPfOynB
    r8Z7f5DRw%2BZa0yhVQ7ArYa71qi%2B6%2BLGHvHa0njwQesWYWXDrQGtJB1QkPPMCUyR
    e5%2FiTuoOAMyPaqZaK8JwxTQHGR2H%2BFieFnwbe3mPLo2mMjdchkSjWipMZY1Ufz6gc
    -Algorithm=AWS4-HMAC-SHA256&X-Amz-Date=20180823T082914Z&X-Amz-SignedH
    z-Expires=3600&X-Amz-Credential=ASIA53RBKAC2WDHIGR6W%2F20180823%2Fus-
    s4_request&X-Amz-Signature=a05a5175a87a6ceb024ccf93b7a5531340d66f642e
    8498e1"
```

```
                    }
                ]
            }
        ],
        "dataRangeProcessingStatus": "DATA_AVAILABLE"
    },
    {
        "dataRangeStartTimeStamp": "2018-08-02T06:50:00.000Z",
        "dataRangeEndTimeStamp": "2018-08-02T06:59:59.999Z",
        "schemaVersion": "1.0",
        "entities": [],
        "dataRangeProcessingStatus": "NO_DATA"
    }
],
"limit": 1000,
"version": 2
}
```


Download DBT Data from the Report Mart

Use this REST call:

```
GET https://<external gateway address>/discoverService/dataDownload/eventData/
  dbtReport?start=<start_index>
  &limit=<maximum_entries>&dataRangeStartTimeStamp=<start_time>
  &dataRangeEndTimeStamp=<end_time>
```

This REST call can have these parameters:

Note: Parameters are optional unless they are noted as being required.

Table 64.6 Parameters for DBT Data from the Report Mart

Name	Type	Description
start	Number	The start index of the items to return. The default value is `0`.
limit	Number	The maximum number of items to return. The default value is `20`.
dataRangeStart TimeStamp	Timestamp	The start timestamp to use in UTC format. For example: `2017-05-09T12:00:00.000Z`
dataRangeEndT imeStamp	Timestamp	The end timestamp to use in UTC format. For example: `2017-05-09T12:59:59.999Z`

The response looks similar to the following example:


```
{
    "links": [
        {
```

```
            "method": "GET",
            "rel": "self",
            "href": "/marketingGateway/discoverService/dataDownload/
              eventData/dbtReport?start=0",
            "uri": "/marketingGateway/discoverService/dataDownload/
              eventData/dbtReport?start=0"
        },
        {
            "method": "GET",
            "rel": "next",
            "href": "/marketingGateway/discoverService/dataDownload/
              eventData/dbtReport?limit=20&start=20",
            "uri": "/marketingGateway/discoverService/dataDownload/
              eventData/dbtReport?limit=20&start=20"
        },
        {
            "method": "GET",
            "rel": "last",
            "href": "/marketingGateway/discoverService/dataDownload/
              eventData/dbtReport?limit=20&start=383",
            "uri": "/marketingGateway/discoverService/dataDownload/
              eventData/dbtReport?limit=20&start=383"
        }
    ],
    "accept": "application/json application/xml",
    "start": 0,
    "count": 403,
    "items": [
        {
            "dataRangeStartTimeStamp": "2017-07-27T01:00:00.000Z",
            "dataRangeEndTimeStamp": "2017-07-27T01:59:59.999Z",
            "schemaUrl": "https://<external gateway address>/discover/
              metadata/dbt_schema_v1.json?X-Amz-Security-Token=FQoDYXdz...",
            "schemaVersion": "1.0",
            "entities": [
                {
                   "entityName": "DBT_ADV_CAMPAIGN_VISITORS",
                    "dataUrlDetails": [
                        {
                            "url": https://<external gateway address>/
                             b554b020160b570a9ad470a2b3717552/dfs/data/dbt-report/
                             DBT_ADV_CAMPAIGN_VISITORS/datekey%3D2017072701/
                             20170807113151000100000_0.gz?X-Amz-Security-Token=
                             FQoDYXdz..."
                        }
                    ]
                },
                {
                    "entityName": "DBT_CONTENT",
                    "dataUrlDetails": [
                        {
                            "url": https://<external gateway address>/
                             b554b020160b570a9ad470a2b3717552/dfs/data/dbt-report/
                             DBT_CONTENT/datekey%3D2017072701/
                             20170807113151000100000_0.gz?
                             X-Amz-Security-Token=FQoDYXdz..."
```

```
                        }
                    ]
                }
            ]
        }
    ],
    "limit": 20,
    "version": 2
}
```


The response contains these entityName items:

- DBT_ADV_CAMPAIGN_VISITORS
- DBT_BUSINESS_PROCESS
- DBT_CONTENT
- DBT_DOCUMENTS
- DBT_COMMERCE
- DBT_FORMS
- DBT_GOALS
- DBT_MEDIA_CONSUMPTION
- DBT_PROMOTIONS
- DBT_SEARCH

The output contains these links:

Table 64.7 Links in REST Response

Name	Description
Link to self	Specifies that the start is 0 and the limit of every page is 20 by default
Next page	A link for accessing the next page with a start and limit
Previous link	A link for accessing the previous page with a start and limit
Last page	A link that represents a link to the last page with a start and limit
Resets	A link for accessing data for reprocessed date ranges
Schema version	The schema version. The default value is `1`.

Note: To use links in the REST response, copy the link from the output. Then, append the actual value for the SAS Customer Intelligence 360 Download API, the generated JWT, and the access point to the URL string. Submit this new string as the REST call.

- Start: start of the record

- Count: total number of records

There are a number of items based on the limit set. Each item consists of the following parameters:

Table 64.8 Download DBT Data from the Report Mart

Parameter	Description
dataRangeStartTimeStamp	The start date of a range for which the data has been processed.
dataRangeEndTimeStamp	The end date of a range for which the data has been processed.
schemaUrl	Metadata for all subject areas.
entityName	The subject area for the link that is provided.
dataUrlDetails	The link to data for a given range of entities. There can be multiple URLs for the same entity depending on the number of files available. The <*filename*>.gz file is downloaded after a user clicks the URL.

You can browse for the next records by clicking **Next page**. By default, the API provides links to all data available in the system in case you need to download data from an additional date parameter (for example, by dataRangeStartTimeStamp).

Download the Data

You can download the data by using one of these methods:

- following the temporary links that are returned when you send the REST call.
- using a SAS program to download the data and view it as SAS data sets. You can contact your SAS representative to assist you in creating this program.

Schema Version API Design and Implementation Overview

The SAS Customer Intelligence 360 Download API provides a JSON file that contains the structure of the provided CSV files. For a given table or entity, it looks similar to this example:

```
{
table_name: "<entityName/tableName>",
column_name: "<name of the column>",
Column_label: "<label for the column>",
column_sequence: "<position in file starting with 1>",
data_type: "<data type (varchar, timestamp, date, decimal, or int)>",
```

```
data_length: "<maximum length of field in bytes>",
column_type: "<datatype in pseudocode nomenclature (for example, vachar(130))>"
},
```

With the implementation of the new SAS Customer Intelligence 360 Streaming Data Platform, the underlying schema for the detail mart and DBTs has been changed. In order to support existing customers who have not yet transitioned to the new platform, a new “schemaVersion” parameter (default value=1; integer value expected) has been added to a new schema version API. If the schema version requested in the API download is available, then all date ranges return the schema URL of the requested schema in the response, regardless of whether the date range was populated previously or on the new platform. The schema URL field in the response always honors the “schemaVersion” parameter. Currently, the available schema versions are 1 (previous platform) and 3 (new platform). A missing value returns the previous platform format. This parameter affects only the schema metadata file; actual data files will be in the new format. The response looks similar to this example:

```
{
    "links": [
        {
            "method": "GET",
            "rel": "self",
            "href": "http://datahubDiscoverService-dhubtest.cidev.sas.us:8080/SASWebMarketingDi
                    /rest/dataDownload/schemaVersions?martType=detail&start=0&limit=10&tenantId
                "uri": "/SASWebMarketingDiscoverService/rest/dataDownload/schemaVersions?martTy
                    &start=0&limit=10&tenantId=2018040907"
        }
    ],
    "accept": "application/json application/xml",
    "start": 0,
    "count": 2,
    "items": [
        {
            "schemaFileName": "detail_schema_v3.json",
            "schemaVersion": "3.0",
            "isLatestVersion": true
        },
        {
            "schemaFileName": "detail_schema_v1.json",
            "schemaVersion": "1.0",
            "isLatestVersion": false
        }
    ],
    "limit": 10,
    "version": 2
}
```

Resets API Design and Implementation Overview

The resets API is a new REST API that returns data ranges that have been reset (reprocessed). Reprocessing means that a job is rerun for the same data range, which is typically performed when a job fails. This API can be accessed via the API gateway using the same process that is used for the SAS Customer Intelligence 360 Download API. Other aspects of this new API are as follows:

- It returns data ranges that have been reset in the previous *x* number of days (default=60 days) passed to the API as a parameter.
- Just as with the SAS Customer Intelligence 360 Download API, it provides access to up to 62 days of detail data and up to 124 days of DBT data.
- Reset data ranges for the detail and DBT report marts are returned by the API.
- The response is sorted in descending order based on the date on which the reset was completed.
- It returns reset data ranges only for users who request the reset. If reprocessing of a job is in progress, the API does not include that data range in the response unless it has been completed. In-progress or scheduled resets are not considered.

Resets API Parameters

Here are the parameters for the resets API:

- martType: Name of the mart for which resets should be retrieved
- dayOffset: Number of days in the past that resets can be checked:
  - The default behavior of this parameter is that the resets API returns records that were reset in the previous *x* number of days. For example, if the current UTC is October 11, 2018 and the reset occurred on October 10, 2018, a record from April 6, 2018, would be included in the response even though it is more than 60 days earlier.

Sample JSON Response for Resets API

Here is a sample JSON response for the resets API:

```
{
    "links": [
        {
            "method": "GET",
            "rel": "self",
            "href": "http://datahubDiscoverService-dhubtest.cidev.sas.us:8080/SASWebMarke
                    rest/dataDownload/eventData/partitionedData/resets?tenantId=20180517&
                    detail&dayOffset=100&start=10&limit=5",
            "uri": "/SASWebMarketingDiscoverService/rest/dataDownload/eventData/partition
                    resets?tenantId=20180517&martType=detail&dayOffset=100&start=10&limit
        },
        {
            "method": "GET",
            "rel": "first",
            "href": "http://datahubDiscoverService-dhubtest.cidev.sas.us:8080/SASWebMarke
                    rest/dataDownload/eventData/partitionedData/resets?limit=5&tenantId=2
                    detail&dayOffset=100&start=0",
            "uri": "/SASWebMarketingDiscoverService/rest/dataDownload/eventData/partition
```

```
                resets?limit=5&tenantId=20180517&martType=detail&dayOffset=100&start=
        },
        {
            "method": "GET",
            "rel": "next",
            "href": "http://datahubDiscoverService-dhubtest.cidev.sas.us:8080/SASWebMarke
                rest/dataDownload/eventData/partitionedData/resets?limit=5&tenantId=2
                detail&dayOffset=100&start=15",
            "uri": "/SASWebMarketingDiscoverService/rest/dataDownload/eventData/partition
                resets?limit=5&tenantId=20180517&martType=detail&dayOffset=100&start=
        },
        {
            "method": "GET",
            "rel": "prev",
            "href": "http://datahubDiscoverService-dhubtest.cidev.sas.us:8080/SASWebMarke
                rest/dataDownload/eventData/partitionedData/resets?limit=5&tenantId=2
                detail&dayOffset=100&start=5",
            "uri": "/SASWebMarketingDiscoverService/rest/dataDownload/eventData/partition
                resets?limit=5&tenantId=20180517&martType=detail&dayOffset=100&start=
        },
        {
            "method": "GET",
            "rel": "last",
            "href": "http://datahubDiscoverService-dhubtest.cidev.sas.us:8080/SASWebMarke
                rest/dataDownload/eventData/partitionedData/resets?limit=5&tenantId=2
                detail&dayOffset=100&start=18",
            "uri": "/SASWebMarketingDiscoverService/rest/dataDownload/eventData/partition
                resets?limit=5&tenantId=20180517&martType=detail&dayOffset=100&start=
        }
    ],
    "accept": "application/json application/xml",
    "start": 10,
    "count": 23,
    "items": [
        {
            "dataRangeStartTimeStamp": "2018-09-28T09:00:00.000Z",
            "dataRangeEndTimeStamp": "2018-09-29T08:59:59.999Z",
            "resetCompletedTimeStamp": "2018-10-02T16:53:49.802Z",
            "downloadUrl": "/SASWebMarketingDiscoverService/rest/dataDownload/eventData/d
                ?tenantId=20180517&dataRangeStartTimeStamp=2018-09-28T09:00:00.000Z&d
                2018-09-29T08:59:59.999Z&includeAllHourStatus=true"
        },
        {
            "dataRangeStartTimeStamp": "2018-09-27T09:00:00.000Z",
            "dataRangeEndTimeStamp": "2018-09-28T08:59:59.999Z",
            "resetCompletedTimeStamp": "2018-10-02T16:40:02.370Z",
            "downloadUrl": "/SASWebMarketingDiscoverService/rest/dataDownload/eventData/d
                ?tenantId=20180517&dataRangeStartTimeStamp=2018-09-27T09:00:00.000Z&d
                2018-09-28T08:59:59.999Z&includeAllHourStatus=true"
        },
        {
            "dataRangeStartTimeStamp": "2018-09-26T09:00:00.000Z",
            "dataRangeEndTimeStamp": "2018-09-27T08:59:59.999Z",
            "resetCompletedTimeStamp": "2018-10-02T15:44:56.843Z",
            "downloadUrl": "/SASWebMarketingDiscoverService/rest/dataDownload/eventData/d
                ?tenantId=20180517&dataRangeStartTimeStamp=2018-09-26T09:00:00.000Z&d
```

```
                2018-09-27T08:59:59.999Z&includeAllHourStatus=true"
        },
        {
            "dataRangeStartTimeStamp": "2018-09-24T13:00:00.000Z",
            "dataRangeEndTimeStamp": "2018-09-25T12:59:59.999Z",
            "resetCompletedTimeStamp": "2018-09-26T12:46:55.218Z",
            "downloadUrl": "/SASWebMarketingDiscoverService/rest/dataDownload/eventData/d
                ?tenantId=20180517&dataRangeStartTimeStamp=2018-09-24T13:00:00.000Z&d
                2018-09-25T12:59:59.999Z&includeAllHourStatus=true"
        },
        {
            "dataRangeStartTimeStamp": "2018-09-23T13:00:00.000Z",
            "dataRangeEndTimeStamp": "2018-09-24T12:59:59.999Z",
            "resetCompletedTimeStamp": "2018-09-26T12:35:46.877Z",
            "downloadUrl": "/SASWebMarketingDiscoverService/rest/dataDownload/eventData/d
                ?tenantId=20180517&dataRangeStartTimeStamp=2018-09-23T13:00:00.000Z&d
                2018-09-24T12:59:59.999Z&includeAllHourStatus=true"
        }
    ],
    "limit": 5,
    "version": 2
}
```

The output contains these links:

Table 64.9 Links in REST Response

Name	Description
Link to self	Specifies that the start is 0 and the limit of every page is 20 by default
Next page	A link for accessing the next page with a start and limit
Previous link	A link for accessing the previous page with a start and limit
Last page	A link that represents a link to the last page with a start and limit

Test Mode API Design and Implementation Overview

The test mode API is a new REST API that is used to return SAS Customer Intelligence 360 Streaming Data Platform data from a pre-release location if the code=PH3TESTMODE parameter is provided in the URL. A random date is selected from the previous seven days and the next two hours of available data from that date and time are returned. Also, any additional parameters normally used to define the date range are ignored.

Test Mode API Parameters

The parameters for the test mode API are as follows:

- schemaVersion (default value=1; integer value expected). Currently, the available schema versions are 1 (previous platform) and 3 (new platform). A missing value returns the previous platform format. This parameter affects only the schema metadata file; actual data files will be in the new format.
- subHourlyDataRangeInMinutes (default value=60). Currently, only values of *60* and *10* are accepted. A missing value or a setting of *60* means that a set of tables is returned every 60 minutes, as in the previous platform. When set to *10*, a set of tables is returned every 10 minutes.

Sample JSON Response for Test Mode API

Here is a sample JSON response for the test mode API:


```
{
    "links": [
        {
            "method": "GET",
            "rel": "self",
            "href": "http://datahubDiscoverService-dhubdev.cidev.sas.us:8080/SASWebMarket
                    /rest/dataDownload/eventData/detail/partitionedData?tenantId=18134&sc
                    PH3TESTMODE&subHourlyDataRangeInMinutes=10",
            "uri": "/SASWebMarketingDiscoverService/rest/dataDownload/eventData/detail
                    /partitionedData?tenantId=18134&schemaVersion=3&code=PH3TESTMODE
                    &subHourlyDataRangeInMinutes=10"
        },
        {
            "method": "GET",
            "rel": "resets",
            "href": "http://datahubDiscoverService-dhubdev.cidev.sas.us:8080/SASWebMarket
                    /rest/dataDownload/eventData/partitionedData/resets?martType=detail&t
            "uri": "/dataDownload/eventData/partitionedData/resets?martType=detail&tenant
            "type": "application/json application/xml"
        },
        {
            "method": "GET",
            "rel": "schemaVersions",
            "href": "http://datahubDiscoverService-dhubdev.cidev.sas.us:8080/SASWebMarket
                    /rest/dataDownload/schemaVersions?martType=detail&tenantId=18134",
            "uri": "/dataDownload/schemaVersions?martType=detail&tenantId=18134",
            "type": "application/json application/xml"
        }
    ],
    "accept": "application/json application/xml",
    "start": 0,
    "count": 3,
    "items": [
```

```
{
    "dataRangeStartTimeStamp": "2019-03-25T04:00:00.000Z",
    "dataRangeEndTimeStamp": "2019-03-25T04:09:59.999Z",
    "schemaUrl": "https://ci-360-deployment-dev-us-east-1.s3.amazonaws.com/CodeDe
            /p-dhubdev1904/discover/metadata/detail_schema_v3.json?X-Amz-Security
            FQoGZXIvYXdzEDsaDMHdZqOZl5UN8N%2FscCK3A1KscAQJO8Ru7rK4Fp%2BT14cfgx7cy
            vGJaYxYawmLMGS2%2B3Yxpc8uzpZ1e07Q2sUesGK2iZjaowu%2FHBbK4Y6Nx1gb653FRk
            X%2FdZsu2i5MfEKG6bBZ8orgZdofDA8Evuf%2FJBZwmmgu1ARORcEXbOUOOC2mo3xyc5%
            %2BZXHQDwp4kBA6SOZ%2FO1IGG1SMzg17VPykhqwKGjRsQLJw6i6vZp5hAmB4WMI7vXgF
            %2FFC8im5%2B84rTPshGvqFuwxgNVylDRYYbhunC3MCrexFvDhfQfCj%2Fnx1%2FQG7VG
            GEu8CuvtlgGyDxc5gGxY58KfssdICq3JeYjz01eq9WRzK9Jndo0jp3r9Xp%2BscqtrG9L
            VqDwRn0W6hb8hbXbJh8gvaTTC%2F%2FcyJQl6M2fq1pOaPxS1TWCtJ2XQpovkxEy%2Bs2
            rkiWVJ3a2h39%2FiUqxpg8XqFJ%2BtTfPlZI6nipbUPXA5J2goqb7i5AU%3D&X-Amz-Al
            HA256&X-Amz-Date=20190325T101811Z&X-Amz-SignedHeaders=host&X-Amz-Expi
            Credential=ASIA53RBKAC22EJQLLHY%2F20190325%2Fus-east-1%2Fs3%2Faws4_re
            Signature=f3d996d64b98cf0f2882f10799451b21fc15abd9b7e806974be20370e1f
    "schemaVersion": "3.0",
    "entities": [
        {
            "entityName": "SESSION_DETAILS",
            "dataUrlDetails": [
                {
                    "url": "https://ci-360-datahub-transfers-dev-us-east-1.s3.ama
            /discoverp3/8fc5e62f7636443e94917414362ae842/dfs/data/detail/SESSION_
            019032504/00/1550761200000_SESSION_DETAILS_79780c20-b201-4e24-8ea0-d3
            -Amz-Security-Token=FQoGZXIvYXdzEDsaDMHdZqOZl5UN8N%2FscCK3A1KscAQJO8R
            ye9n5X13fLJZwsmon2IQvGJaYxYawmLMGS2%2B3Yxpc8uzpZ1e07Q2sUesGK2iZjaowu%
            kc03tdJ8twZ8uMs9aSQJX%2FdZsu2i5MfEKG6bBZ8orgZdofDA8Evuf%2FJBZwmmgu1AR
            %2F%2FdfdnntGhbwOPAd%2BZXHQDwp4kBA6SOZ%2FO1IGG1SMzg17VPykhqwKGjRsQLJw
            Fv3MPxkBrFEcNBdJKBdl%2FFC8im5%2B84rTPshGvqFuwxgNVylDRYYbhunC3MCrexFvD
            GAhxhFAp7o%2BotAqNkFGEu8CuvtlgGyDxc5gGxY58KfssdICq3JeYjz01eq9WRzK9Jnd
            L7FrhYpV8IMYccIb0687VqDwRn0W6hb8hbXbJh8gvaTTC%2F%2FcyJQl6M2fq1pOaPxS1
            2JLa1knd6FynJeTzRJyDrkiWVJ3a2h39%2FiUqxpg8XqFJ%2BtTfPlZI6nipbUPXA5J2g
            -Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Date=20190325T101811Z&X-Amz-Sig
            -Amz-Expires=3600&X-Amz-Credential=ASIA53RBKAC22EJQLLHY%2F20190325%2F
            aws4_request&X-Amz-Signature=76ff8ce4a8cbaa9eeac6a83446dce99989fa3091
            02a6bd3aceb5e2a6e7b"
                }
            ]
        }
    ]
},
{
    "dataRangeStartTimeStamp": "2019-03-25T06:00:00.000Z",
    "dataRangeEndTimeStamp": "2019-03-25T06:09:59.999Z",
    "schemaUrl": "https://ci-360-deployment-dev-us-east-1.s3.amazonaws.com/CodeDe
            /p-dhubdev1904/discover/metadata/detail_schema_v3.json?X-Amz-Security
            FQoGZXIvYXdzEDsaDMHdZqOZl5UN8N%2FscCK3A1KscAQJO8Ru7rK4Fp%2BT14cfgx7cy
            vGJaYxYawmLMGS2%2B3Yxpc8uzpZ1e07Q2sUesGK2iZjaowu%2FHBbK4Y6Nx1gb653FRk
            X%2FdZsu2i5MfEKG6bBZ8orgZdofDA8Evuf%2FJBZwmmgu1ARORcEXbOUOOC2mo3xyc5%
            %2BZXHQDwp4kBA6SOZ%2FO1IGG1SMzg17VPykhqwKGjRsQLJw6i6vZp5hAmB4WMI7vXgF
            %2FFC8im5%2B84rTPshGvqFuwxgNVylDRYYbhunC3MCrexFvDhfQfCj%2Fnx1%2FQG7VG
            GEu8CuvtlgGyDxc5gGxY58KfssdICq3JeYjz01eq9WRzK9Jndo0jp3r9Xp%2BscqtrG9L
            VqDwRn0W6hb8hbXbJh8gvaTTC%2F%2FcyJQl6M2fq1pOaPxS1TWCtJ2XQpovkxEy%2Bs2
            rkiWVJ3a2h39%2FiUqxpg8XqFJ%2BtTfPlZI6nipbUPXA5J2goqb7i5AU%3D&X-Amz-Al
            HA256&X-Amz-Date=20190325T101811Z&X-Amz-SignedHeaders=host&X-Amz-Expi
```

```
            Credential=ASIA53RBKAC22EJQLLHY%2F20190325%2Fus-east-1%2Fs3%2Faws4_re
            Signature=6716eeb1f18f997705fb9f56bf64d2fedc8615cfb80d7bdaef17d6812e6
        "schemaVersion": "3.0",
        "entities": [
            {
                "entityName": "VISIT_DETAILS",
                "dataUrlDetails": [
                    {
                        "url": "https://ci-360-datahub-transfers-dev-us-east-1.s3.ama
            /discoverp3/8fc5e62f7636443e94917414362ae842/dfs/data/detail/VISIT_DE
            019032506/00/1549570800000_VISIT_DETAILS_090d4d02-500e-43f5-8ccb-ad05
            -Amz-Security-Token=FQoGZXIvYXdzEDsaDMHdZqOZl5UN8N%2FscCK3A1KscAQJO8R
            7cye9n5X13fLJZwsmon2IQvGJaYxYawmLMGS2%2B3Yxpc8uzpZ1e07Q2sUesGK2iZjaow
            53FRkc03tdJ8twZ8uMs9aSQJX%2FdZsu2i5MfEKG6bBZ8orgZdofDA8Evuf%2FJBZwmmg
            o3xyc5%2F%2FdfdnntGhbwOPAd%2BZXHQDwp4kBA6SOZ%2FO1IGG1SMzg17VPykhqwKGj
            4WMI7vXgFv3MPxkBrFEcNBdJKBdl%2FFC8im5%2B84rTPshGvqFuwxgNVylDRYYbhunC3
            nx1%2FQG7VGAhxhFAp7o%2BotAqNkFGEu8CuvtlgGyDxc5gGxY58KfssdICq3JeYjz01e
            Xp%2BscqtrG9L7FrhYpV8IMYccIb0687VqDwRn0W6hb8hbXbJh8gvaTTC%2F%2FcyJQl6
            2XQpovkxEy%2Bs2JLa1knd6FynJeTzRJyDrkiWVJ3a2h39%2FiUqxpg8XqFJ%2BtTfPlZ
            7i5AU%3D&X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Date=20190325T101811Z
            SignedHeaders=host&X-Amz-Expires=3600&X-Amz-Credential=ASIA53RBKAC22E
            %2Fus-east-1%2Fs3%2Faws4_request&X-Amz-Signature=681345ee026dabf8ea3a
            195ae7cd62b545cced304e9ac65"
                    }
                ]
            }
        ]
    },
    {
        "dataRangeStartTimeStamp": "2019-03-25T06:50:00.000Z",
        "dataRangeEndTimeStamp": "2019-03-25T06:59:59.999Z",
        "schemaUrl": "https://ci-360-deployment-dev-us-east-1.s3.amazonaws.com/CodeDe
            /p-dhubdev1904/discover/metadata/detail_schema_v3.json?X-Amz-Security
            FQoGZXIvYXdzEDsaDMHdZqOZl5UN8N%2FscCK3A1KscAQJO8Ru7rK4Fp%2BT14cfgx7cy
            vGJaYxYawmLMGS2%2B3Yxpc8uzpZ1e07Q2sUesGK2iZjaowu%2FHBbK4Y6Nx1gb653FRk
            X%2FdZsu2i5MfEKG6bBZ8orgZdofDA8Evuf%2FJBZwmmgu1ARORcEXbOUOOC2mo3xyc5%
            %2BZXHQDwp4kBA6SOZ%2FO1IGG1SMzg17VPykhqwKGjRsQLJw6i6vZp5hAmB4WMI7vXgF
            %2FFC8im5%2B84rTPshGvqFuwxgNVylDRYYbhunC3MCrexFvDhfQfCj%2Fnx1%2FQG7VG
            GEu8CuvtlgGyDxc5gGxY58KfssdICq3JeYjz01eq9WRzK9Jndo0jp3r9Xp%2BscqtrG9L
            VqDwRn0W6hb8hbXbJh8gvaTTC%2F%2FcyJQl6M2fq1pOaPxS1TWCtJ2XQpovkxEy%2Bs2
            rkiWVJ3a2h39%2FiUqxpg8XqFJ%2BtTfPlZI6nipbUPXA5J2goqb7i5AU%3D&X-Amz-Al
            HA256&X-Amz-Date=20190325T101811Z&X-Amz-SignedHeaders=host&X-Amz-Expi
            Credential=ASIA53RBKAC22EJQLLHY%2F20190325%2Fus-east-1%2Fs3%2Faws4_re
            Signature=f3d996d64b98cf0f2882f10799451b21fc15abd9b7e806974be20370e1f
        "schemaVersion": "3.0",
        "entities": [
            {
                "entityName": "SESSION_DETAILS",
                "dataUrlDetails": [
                    {
                        "url": "https://ci-360-datahub-transfers-dev-us-east-1.s3.ama
            /discoverp3/8fc5e62f7636443e94917414362ae842/dfs/data/detail/SESSION_
            019032506/50/1550761200000_SESSION_DETAILS_79780c20-b201-4e24-8ea0-d3
            -Amz-Security-Token=FQoGZXIvYXdzEDsaDMHdZqOZl5UN8N%2FscCK3A1KscAQJO8R
            ye9n5X13fLJZwsmon2IQvGJaYxYawmLMGS2%2B3Yxpc8uzpZ1e07Q2sUesGK2iZjaowu%
            kc03tdJ8twZ8uMs9aSQJX%2FdZsu2i5MfEKG6bBZ8orgZdofDA8Evuf%2FJBZwmmgu1AR
```

```
                    %2F%2FdfdnntGhbwOPAd%2BZXHQDwp4kBA6SOZ%2FO1IGG1SMzg17VPykhqwKGjRsQLJw
                    Fv3MPxkBrFEcNBdJKBdl%2FFC8im5%2B84rTPshGvqFuwxgNVylDRYYbhunC3MCrexFvD
                    GAhxhFAp7o%2BotAqNkFGEu8CuvtlgGyDxc5gGxY58KfssdICq3JeYjz01eq9WRzK9Jnd
                    L7FrhYpV8IMYccIb0687VqDwRn0W6hb8hbXbJh8gvaTTC%2F%2FcyJQl6M2fq1pOaPxS1
                    2JLa1knd6FynJeTzRJyDrkiWVJ3a2h39%2FiUqxpg8XqFJ%2BtTfPlZI6nipbUPXA5J2g
                    Algorithm=AWS4-HMAC-SHA256&X-Amz-Date=20190325T101811Z&X-Amz-SignedHe
                    Expires=3600&X-Amz-Credential=ASIA53RBKAC22EJQLLHY%2F20190325%2Fus-1%
                    &X-Amz-Signature=da0f64955b5de25fd46e79041a1c997b7e9be50a9e6d618385be
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    "version": 2
}
```

PART 18

Testing

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Testing Overview

Use testing as a way to optimize the conversion rates of your content. By tracking and analyzing how users interact with your content, SAS Customer Intelligence 360 can help you understand what content is the most effective.

About Testing

In SAS Customer Intelligence 360 you can test activity paths, web content, and mobile content.

Activity Path Testing

With the A/B Test node in an activity, you can test paths against each other. For example, the marketing department in a hotel can compare several sequences of offers. The marketing department can then determine which sequence is best, whether one of the challengers is better than the champion, and what the gain is compared to making no offers.

For more information about testing activity paths, see “About Testing Activity Paths” on page 923.

Web and Mobile Testing

Test tasks such as AB tasks and MVT tasks compare the conversion rates of two or more versions of a creative or set of creatives by tracking user response rates. Analysis determines which variants lead to the most conversions based on your metrics. In addition, analysis of metric data can also determine whether there are sub-segments of your target audience that respond better to a variant other than the winning variant. The following types of test tasks are available:

- mobile spot A/B test
- web A/B test
- web MVT test

For more information about A/B and MVT test tasks, see “Deciding Which Type of Test to Run” on page 930.

Key Testing Concepts

Before you create a test task or test an activity path, ensure that you are familiar with key testing concepts.

Conversion Rate

The conversion rate represents the percentage of unique users who complete a goal (also known as a conversion) and tells you how successfully the content that you are testing is performing. In other words, the conversion rate is the percentage of people that meet the primary metric of your test. For example, you create a mobile spot A/B test to see whether your new creative results in more people subscribing to your blog. Out of 100 test participants, 70 subscribe to the blog. Your conversion rate for the updated creative is 70%.

For more information about the conversion rate and its relationship to a primary metric, see “Primary and Secondary Metrics” on page 959.

Control

Control Content

When you are testing content, it can be useful to compare the performance of your changed content with the performance of content that is unchanged. The content that is unchanged is known as the *control* and is unlikely to influence the conversion rate, either negatively or positively. For example, your website contains a creative that uses red text to advertise a sale. You want to know whether changing the text color on the creative increases conversion, so you create one creative with blue text and another creative with green text. In this case, the control is the creative with the red text, because it is not changing and is not expected to affect the conversion rate.

In SAS Customer Intelligence 360 there are a couple of ways that you can use a control in your tests. If you are comparing activity paths, the control is the path without other tasks. If you are creating A/B or MVT test tasks, either of these options can be used to include a control in your test:

- By default, every A/B and MVT test task contains a champion variant. Often, the champion variant represents the content that is currently in use on your site or mobile application and is expected to have the highest conversion rate. During test tasks, the performance of the other content that you are testing is measured against the champion variant. In the previous example, the creative with the red text is the champion variant. The performance of the blue-text and green-text creatives is measured with respect to the performance of the champion; the blue-text and green-text creatives perform either as well as, better than, or worse than the champion variant with the red text.
- In addition to testing with champion variants, you can choose to add a control variant to your A/B or MVT test task. The control variant uses the default content of the spot as its creative.

  Note: The default content of a spot is the creative that is meant to ensure that the spot is never empty, and is not a creative that is specifically intended for your target audience.

Control Group

The people that receive the control creative or that are assigned to the control path are known as the *control group*. The control group is a subset of your target audience. By default, the size of the control group is set to 5%. For example, if your web A/B test includes a control creative and has 100 participants and a control group size of 5%, then five people receive the control creative. Continuing the example, 5% of the people in the test receive the original creative with the red text, because it is the control creative.

Note: The default size of the control group is set on the **Analytic Settings** ⇨ **Control Group** page of **General Settings** and can be changed for a particular activity or task.

Variants

Variants represent the content that you are testing, and a *variant* is a version of the content. Here are some examples of variants:

- An A/B test compares how three different creatives perform in the same spot on a mobile application. Each creative is a variant and there are three variants in your test.
- An A/B test compares how three different combinations of five creatives perform on the home page of your site. A single combination of creatives is one variant in the test, so there are three variants in your test.
- An activity compares how three different paths perform. Each path is a variant and there are three variants.

SAS Customer Intelligence 360 has some special variant types.

- A *control variant* is the variant that you expect will not influence your current conversion rate, either negatively or positively. The control variant is delivered to the control group. In an A/B or MVT test, the control variant displays the default content of the spot or spot set and is not included by default. In an activity path test, the control variant is the variant without other tasks.
- A *champion variant* is used as a benchmark for the A/B test and can also serve as a control. The performance of other variants that are included in the task is compared against the performance of the champion in order to determine the overall variant winner. For example, you might have one creative that is currently in use on your website and three new creatives that have not been delivered yet. You can create a web A/B test task that compares the current creative and the new creatives. In the A/B test task, you can add all of the creatives and label the current creative as the champion variant.

  Note: By default, A/B tests contain a champion variant. However, this feature can be disabled.
- The *overall variant winner* is the variant that performs the best.

  Note: Before the overall variant winner can be determined, a minimum estimated sample size must be met.

Minimum Sample Size

The minimum estimated sample size is the minimum number of unique participants needed in a test before analytics can determine whether a variant winner can be identified. When estimating sample size, analytics uses the number of variants, the confidence interval and threshold value, and the value of the **Minimum detectable difference**. In addition, variant weights are also used in estimating the sample size for A/B test tasks.

Note: To set the **Minimum detectable difference**, click **General Settings** on the navigation bar and select **Analytic Settings** ⇨ **Test**.

TIP SAS Customer Intelligence 360 starts updating the test results data before the minimum sample size is met. You can use this data to declare a variant as the test winner before the minimum sample size requirement is met.

Impression

An *impression* is an instance of your content being displayed to your test participant. In a web A/B test, an impression is the display of your creative on a web page that gets loaded. In a mobile spot A/B test, an impression is the display of your creative on the mobile application. In an A/B or MVT test task, you can set impression limits by user or by session. The limits that you set are valid for the duration of the task.

Metrics

Metrics measure user actions that the system can detect, such as a person clicking a spot on a web page. Metrics measure the success of the content being delivered by a task. SAS Customer Intelligence 360 has different categories of metrics. Not all metric types are available for all task types:

- A primary metric measures conversions to determine the success of the task or activity path. A test can contain only one primary metric. A **Click Through** metric is the default primary metric for web A/B test tasks and mobile A/B test tasks. If you are testing activity paths, there is no default primary metric. Primary metrics are required for web A/B tasks, mobile A/B tasks, and A/B tests on activity paths.
- A secondary metric measures other benchmarks that you are interested in. You can add multiple secondary metrics to your web and mobile spot A/B test tasks, as well as to your A/B test for activity paths. However, each secondary metric can have only one data view or event.
- In addition to primary and secondary metrics, there is a set of *e-commerce metrics* that is available only for web A/B test tasks and mobile spot A/B test tasks. These metrics are used to gather and analyze different types of data related to e-commerce, such as data about revenue, virtual carts, time on a site or mobile application, page views, and conversion rates.

  Note: There are fewer e-commerce metrics available for A/B mobile spot tasks than there are for A/B web tasks.

For example, you might create a web A/B test task to measure which version of a product picture leads to more conversions. In addition, you want data about whether the people who convert are clicking your new website banner. The primary metric for your task is the action that a user takes to purchase your product. A secondary metric is the user clicking your site's banner. In addition, you might want to create a mobile A/B web task that measures how successfully a spot on your mobile application leads users to subscribe to your newsletter. In that case, your primary metric is the action that the user takes to subscribe to your newsletter.

For more information about primary and secondary metrics, see "Primary and Secondary Metrics" on page 959.

For more information about e-commerce metrics, see these topics:

- "E-commerce User Metrics" on page 961
- "E-commerce Session Metrics" on page 964

See Also

Chapter 17, "Understanding Item Insights," on page 161

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Testing Activity Paths

About Testing Activity Paths

With the A/B Test node in an activity, you can test paths against each other. For example, the marketing department in a hotel can compare several sequences of offers. The marketing department can then determine which sequence is best, whether one of the challengers is better than the champion, and what the gain is over making no offers.

An A/B Test node can contain multiple paths. Each path can contain a sequence of tasks. Within the A/B Test, you can define a champion path and more than one challenger path. You can also include a control path that contains no tasks. You specify the percentage of customers that are assigned to each path. Each customer is assigned to a path and follows only that path. You can then define the primary metric for the A/B test. This metric is used to determine the winner of the test.

An activity can contain only one A/B Test node.

For information about changing the default settings for A/B tests, see “Test” on page 104.

Comparing Activity Paths

Add an A/B Test Node

Click + in the activity map and select **A/B Test**. An A/B Test node cannot be the first node in an activity map.

The A/B Test node can follow a Task node, a Trigger event, or a Split output node that does not contain a waiting period.

The A/B Test node cannot follow a Wait node or any node that contains a waiting period. Conditional split output nodes or Other nodes might be configured with a waiting period. The A/B Test node cannot follow those nodes.

Following the A/B Test node, customers are merged into a single path in the activity map.

For information about creating activities, see “Creating an Activity Map” on page 746.

Add Path Variants

- On the **Node Details** tab of the A/B Test node, select **Include control path** to add a control path variant that does not contain any Task nodes or Wait nodes. The control path is compared with the other path variant to determine whether a sequence of tasks nets a higher return than no tasks.

  For more information, see “Control Group” on page 105.

- Click + to add a new path variant.

  Pathnames must be unique within the A/B Test node. The node can contain up to 20 path variants.

- Select the path variant that you want to mark as the champion and click .

  The champion automatically gets 70% to 72% of the distribution frequency, depending on the number of path variants.

  Note: Changing the champion resets all of the assigned distributions to the default values and assigns the largest value to the champion.

- Click to set the distribution for each path variant.

  The distribution determines the percentage of customers who are assigned to each path variant. The sum of the distribution must equal 100%.

- Select the path variant that you want to delete and click . Deleting a path variant resets the distribution.

- Click ⋮ for more actions, such as renaming a path variant or resetting the distribution.

- **Estimated required sample size** is the minimum number of unique participants needed in a test before analytics can detect a difference in conversion rates. When estimating sample size, analytics uses the number of variants and the value of the **Minimum detectable difference**. The minimum detectable difference is set in the Analytic Settings. For more information, see "Test" on page 104.

Click **Done** to save your changes. Click **Cancel** to close the window without saving your changes.

Define Paths

After you define the path variants, you can add Task and Wait nodes to the path variants in the A/B Test node. Random selection is used to assign the proper percentage of customers to each path variant.

Each path, except for the Control path, must have at least one node. The Control path cannot have any nodes. A Wait node cannot be at the end of a path. The A/B Test node cannot contain any Splits.

A task within an A/B Test node must have the same schedule as the activity, or follow the same schedule as the other tasks within the A/B Test node.

Assign a Primary Metric to an A/B Test

To publish the activity, you must assign a primary metric to an A/B Test. For example, you might want to sell a golf package at your hotel. The paths in the A/B Test node evaluate different combinations of messages and channels to persuade a customer to purchase the golf package.

Click the **Insights** tab in A/B Test properties to assign a primary metric.

Note: Attributes are joined to data views by an AND operator. Make sure that you do not define conflicting attributes that result in a condition that cannot be met.

Click **Done** to save your changes. Click **Cancel** to close the window without saving your changes.

Activity A/B Test Insights

The **Insights** tab displays information about the performance of the paths in the A/B Test node and a report that categorizes the collected data.

Summary

The **Summary** section displays the lift and conversion rate of each path in the A/B Test node.

The three published activities whose recommended A/B test winners have the highest lift are listed on the SAS Customer Intelligence 360 **Home** page.

Performance

The performance of each path variant is listed in a table in the **Performance** section. The lift and confidence levels are listed as percentages in the Champion Lift and Control Lift columns.

When enough data has been collected to find an overall variant winner, the potential impact is listed in the Performance table. The potential impact is the estimated increase in the number of conversions the marketer would have achieved if the winning variant had been delivered to everybody in the test. The top three A/B tests that have a recommended winner are listed on the SAS Customer Intelligence 360 **Home** page.

For information about declaring a winner, see “Declare a Winner” on page 926.

Identifying the Winning Path Variant

Evaluate Path Variants

The overall winner is the path variant that performs best based on the data view or event that makes up the primary metric. Typically, the path variant with the greatest lift over the champion is recommended as the winner. The champion is recommended as the winner if the other path variants have a negative lift.

The path variant with the highest measured conversion rate is the baseline. In order for the path variant to be declared the winner, these conditions must be met:

- The unique visitor count meets or exceeds the estimated sample size.
- The lift, when the path variant is the challenger against every other path variant, meets or exceeds the threshold.
- The confidence for every pair involving the path variant meets or exceeds the threshold. The threshold defaults to 90%. For information about changing the default threshold in Analytic Settings, see “Test” on page 104.

Performance information for each path variant is displayed on the **Insights** tab. For more information, see “Activity A/B Test Insights” on page 925.

Declare a Winner

When you declare a winner, the original activity ends and a new activity is created. In the new activity, the A/B Test node is replaced with the content of the winning path.

1 On the **Insights** tab, click **Declare Winner**.

2. Select the overall test winner that the system recommends or select another path variant as the winner.
3. To publish the new activity immediately, select **Publish the new activity.**
4. Click **Define Activity**. All of the tasks in the original activity are duplicated and saved under a different name. You can edit the names of the new activity and the duplicated tasks. By default, the duplicated tasks are named *taskname*_copy. Click **Edit task name format** to change the default.
5. Click **Create Activity**.

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Testing Creatives

Deciding Which Type of Test to Run

Types of Tests

The objective of a test task is to find the variant that performs best for the test target audience. In addition, SAS Customer Intelligence 360 can also discover subsegments of the audience that respond better to a variant that is not the winning variant. For more information about Segment Discovery, see “About Segment Discovery” on page 475.

There are different ways to test creative performance:

A/B Test (Single Spot)

- Use this task to test how different creatives perform in the same spot. In this case, each creative is a variant in the test.
- Optimizing this test makes the variant weights dynamic, which enables SAS Customer Intelligence 360 to change the distribution of variants as the A/B test progresses. As a result, the best-performing variant gets a larger portion of the distribution.

For more information about A/B testing, see “About A/B Testing” on page 931.

A/B Test (Spot Set)

- Use this task to test how different combinations of creatives perform. In this case, you select a spot set to test, instead of a spot.

  Note: All spots in the set must be on the same page.
- When testing a spot set, a single combination of creatives is one variant in the test.
- Because you set up the variants manually, creating an A/B test using spot sets is most useful if you do not have too many combinations to test.
- Optimizing this test makes the variant weights dynamic, which enables SAS Customer Intelligence 360 to change the distribution of variants as the A/B test progresses. As a result, the best-performing variant gets a larger portion of the distribution.

For more information about A/B testing, see “About A/B Testing” on page 931.

Multivariate Test

- This task also tests how different combinations of creatives perform. In this case, the different combinations of creatives are generated by SAS Customer Intelligence 360 based on the spot set and creatives that you specify.
- When using a multivariate test, a single combination of creatives is one variant in the test.
- You can choose to test all possible combinations, a subset of the combinations, or you can optimize the test. Optimized multivariate test tasks use analytics to determine what subset of variants are required so that the test can derive reliable conclusions.

- Multivariate test tasks often identify a few combinations of creatives that can then be further tested in an A/B test task.

For more information about multivariate testing, see “About Multivariate Testing” on page 941.

Testing a Spot or Set of Spots

Single-spot A/B test tasks are suitable for changing one variable at a time. For example, an A/B test might determine which image out of four possible images performs best in a spot. The A/B test randomly divides the target audience so that each audience subset sees one of the four images in the spot.

If you want to vary both the image and the text associated with it, you can perform several sequential A/B tests to isolate the effect of each change. In the first A/B test task, you could have the same text with different images. In the next A/B test, you might test the winning image with four different text colors.

Here are the disadvantages of sequential A/B tests:

- They require a lot of time.
- They cannot compare the effect of the interactions of the content.

Either a multivariate test task or an A/B test that uses a spot set can test a scenario where you change more than one variable at the same time. For example, you can create a spot set and use it in either an A/B test or a multivariate test where both the image and the text change at the same time.

Testing a Spot Set with an A/B Test or a Multivariate Test

When deciding whether to test a spot set using an A/B test or a multivariate test, consider these items:

- Do you want to manually create each variant? In an A/B test, you set up each variant. In a multivariate test, the variants are generated for you.
- A multivariate test does not automatically change the weights of the different variants based on performance. An optimized A/B test does.
- A/B tests and multivariate tests calculate sample sizes differently. You can set up identical A/B tests and multivariate tests to see which test has the sample size that better meets your needs.

About A/B Testing

Use A/B test tasks to compare the effectiveness of multiple creatives. The creatives that are being tested can all be from the same message or from different messages. There are two types of A/B test tasks: mobile and web. Mobile A/B test tasks compare the performance of creatives that are delivered to a mobile application (app). Web A/B test tasks compare the performance of creatives that are delivered to a website. The steps for creating an A/B test task are almost the same as the steps for creating a standard task of the same type. The difference is that creatives in an A/B test task are treated as variants.

Compare Creatives

A *variant* is a creative that you are testing. A minimum of two variants is required before you can publish an A/B test task, and one of the variants must be denoted as the champion variant. An A/B test task cannot contain more than 20 variants. A *champion variant* is the control variant in the A/B test task. The performance of other variants that are included in the task is compared against the performance of the champion in order to determine the overall variant winner. For example, you might have one creative that is currently in use on your website and three new creatives that have not been delivered yet. You can create a web A/B test task that compares the current creative and the new creatives. In the A/B test task, you can add all of the creatives and label the current creative as the champion variant.

In your A/B test task, there is an option that enables the system to optimize the distribution of the variants while the test is running. This option enables the system to change the distribution of variants as the A/B test progresses so that the best-performing variant gets a larger portion of the distribution. The analytics that optimize the task are run hourly.

In task optimization, the initial weights are the weights that are assigned at the time of the optimization. Optimizing the distribution of the variants prevents new segments from being discovered by the analytics.

Find the Winning Creative

The variant that performs the best against the target audience is denoted as the *overall variant winner*. However, before the overall variant winner can be determined, a minimum estimated sample size must be met. The minimum estimated sample size is the minimum number of unique participants needed in a test before analytics can detect a difference in conversion rates.

Note: When estimating sample size, analytics uses the number of variants and the value of the **Minimum detectable difference**. To set the **Minimum detectable difference**, click **General Settings** on the navigation bar and select **Analytic Settings**.

After a minimum confidence level is reached, the system identifies the overall variant winner. You can then decide to end the test task and create a new task with the winning creative.

As the A/B test progresses, the system's analytics might discover that one variant out-performs the overall variant winner for a subset of your target audience. This subset of people is called a *discovered segment*, and you can access the profile for a discovered segment on the **Insights** tab. The profile includes details about the discovered segment, including which criteria distinguish the discovered segment from the segment defined in targeting.

Note: Discovered segments are not supported in A/B test tasks that optimize the distribution of the variants.

Set Task Priority

Although you cannot set a priority for an A/B test task, it always takes priority over a task that is not an A/B test task. For example, if you have a Web task and a Web A/B test task that deliver content to the same spot, the Web A/B test task always delivers its content, regardless of the priority of the Web task.

Create a Standard Task from an A/B Test Task

You can create a standard task that contains the same targeting, spot, and metrics as an A/B test task. Open the A/B test task and click ⋮. Select **Create new task**, and then select the variant that you want to use in your new task.

You can also create a standard task from the winning variant.

Creating an A/B Test Task

You can compare the performance of multiple creatives. When creating a test task, you can optimize the task, which enables analytics to use a multi-armed bandit approach to finding the best-performing variant. As a result, an optimized test task delivers the best-performing variants to more of the target audience. Test tasks can also discover previously undefined segments of people that prefer a different creative than the creative that most of the target audience prefers. You can learn about a discovered segment by reviewing its profile.

Add Content to Your Task

Select the Spot or Spot Set

1. From the navigation bar, click **Tasks**.
2. Click and select the task type.
   - Select **Mobile Spot A/B Test** to compare creatives in a mobile app.
   - Select **Web A/B Test** to compare creatives on a website.

   When you create a task, it has a Designing status, which indicates that the task is still being worked on and is not ready to be published.
3. Select the spot where you want your variants to be displayed.

- If you want to compare the performance of creatives in the same spot, select the spot that you want the task to use. Each creative is denoted as a variant.
- For a Web A/B Test task, If you want to compare the performance of creatives in a spot set, select the spot set that you want the task to use. Each combination of creatives in the set is denoted as a variant.
  - Avoid selecting spot sets that display a subset of their spots on one web page. The analytics assume that all of the spots in the set are always available simultaneously.

    Note: To guarantee that all of the spots in a set are displayed simultaneously, the values for the spot location details must be identical across all of the spots in the set. Matching the spot location details enables analytics to run successfully on your A/B test or web multivariate test task.
  - Avoid spots that are used by another active A/B task or web multivariate test task.

4 Click **Create Task**.

Add Message or Creatives

The **Content** tab contains the details that are associated with the content that the task delivers. Click **Select Content** to add variants and set their properties. You can also complete these actions:

- set the distribution of the variant frequency.
- optimize the test so that the system can change the distribution of variants as the A/B test progresses. Optimizing the test ensures that the best-performing variant gets a larger portion of the distribution.
- add or remove variants. After the task is published, variants cannot be added or removed.

  Note: When you add a variant, select an existing message or creative for that variant. Alternatively, you can create a message or creative. To create a message or creative, click **New Message** or **New Creative**. The message or creative that you create is automatically added to the task.
- rename variants.
- change the champion. After the task is published, the champion cannot be changed.
- set impression limits.
- change the creative for a variant. After the task is published, the variant's creative cannot be changed.

Add a Target Audience

On the **Targeting** tab, set the criteria that define the target audience for the content that the task delivers.

On the **Eligible** page, you can specify which people to include in your target audience. On the **Exclusions** page, you can specify which people to exclude from your target audience.

Note the following rules about defining the target audience:

- If no criteria are added, the target audience includes everyone.
- When you create a target audience using demographic criteria such as city, age, gender, membership status, and so on, only the users who satisfy criteria based on their current data are included in the target audience.
- Previously defined segments, events, and data views can be selected as criteria.

  Note: You must define a login event type if you have tasks that depend on segments with data from logged-in users.

  > **TIP** The attributes of the events or data views added to the targeting criteria can be selected as values for personalization variables by navigating to **Content** ⇨ **Personalization**. For more information about delivering personalized content, see "Personalizing HTML Creatives" on page 694.

- You can use customer lists that have been imported from other sources, such as SAS Marketing Automation.
- When you add **Browser and Device** to your criteria, only the people who are using that browser or device during the current session are included in the target audience. For example, if you add Chrome as the browser, only the people who are using Chrome during the current session are eligible to be included in the target audience.
- When you add a spot attribute that contains a URL query string parameter, the value of that parameter needs to be decoded for multi-byte character sets (MBCS). If you are adding a URL query string, the value should be encoded for MBCS.

To add criteria:

1. Click **Eligible** or **Exclusions**.
2. Click + to add a criteria row.
3. In the **Specify criteria** box, click .
4. In the **Select Criteria** window, select the criteria to add.

   To locate criteria, use these options:

   - Click to display a hierarchical folder view of criteria. Click to display individual merge tags in alphabetical order.
   - Click to expand all of the folders. Click to collapse all of the folders.
   - Click to view details, if available, about the criteria.
   - Search for criteria by entering the name in the **Search** field. Select criteria and click to display details.
5. Click **OK**.
6. If applicable, in the **Specify values** box, click and specify a value for the criteria.

For example, if channel is your selected criterion, you might specify a value of mobile or web. Whereas, there is no need to specify a value if a segment is selected.

7 Repeat steps 1-6 to add criteria.

8 Use these options to work with the criteria list:

- Click to view a summary of the criteria.
- Click to make a copy of the criteria. Copying criteria saves steps when you use the same criteria but supply different values.
- Click or to move criteria up or down in the list. The position determines the order in which the criteria are checked.
- Click to create a group for a set of criteria. Groups enable you to nest criteria.
- Click to delete criteria.

9 Select **All of the following** to include members who meet all of the criteria in a group. Or, select **Any of the following** to include members who meet one or more of the criteria in a group.

10 Click .

Mobile Device and Cell Service Attributes

If you are creating a Mobile Spot A/B Test task, you can also select mobile device and cell service attributes to define your target audience. You can select these mobile device attributes:

- Mobile App Version. This value is extracted from native APIs, or it can be specified by `setApplicationVersion` in the mobile SDK. For more information, see "Determine the Mobile App Version" on page 412.
- Mobile Application Name
- Mobile Device Manufacturer
- Mobile Device Model
- Mobile Device Type
- Mobile Platform. The attribute values are *iOS* or *Android*.
- Mobile Platform Version
- Mobile Screen Height
- Mobile Screen Width

Cell service attributes are available only on devices that have mobile data access. You can select these cell service attributes:

- Mobile Carrier Name
- Mobile Country Code
- Mobile Network Code

Set Metrics

Metrics measure events that the system can detect. For example, the system can detect certain events such as a person clicking a spot on a web page. Add metrics to measure the success of the content being delivered by the task.

Set a Primary Metric

The primary metric measures conversions to determine the success of the task. There can be only one primary metric. You can either edit an existing primary metric or add a new one and then remove the previous metric.

1 Click ✚.

2 Select the criteria that you want to add. You can select an event view or a data view.

   For more information about events, see “User-Defined Events” on page 304. For more information about data views, see “About Data Views” on page 459.

3 If attributes are defined for the event or data view, select the attribute conditions that must be met. For example, for a Click Through metric, you can select a particular creative as an attribute condition. The primary metric would be a click-through response to that creative.

   Note: Attributes are joined by an AND operator. Make sure that you do not define conflicting attributes that result in a condition that cannot be met.

4 To mark this selection as a contact or response that can be tracked and used for reporting and future targeting, select **Classify this selection**. Classifying an event or data view enables you to compare contacts and responses across creatives and channels. You can personalize future messages and creatives. You can also use the information to segment customers. You can classify events and data views in both primary and secondary metrics.

   To record the number of times that a customer interacts with a creative or a spot, select **Mark this selection as a contact**. This information is available as contact history for SAS Marketing Automation, SAS Real-Time Decision Manager, and other applications.

   To mark this selection as a response to a creative, select **Mark this selection as a response**.

5 Select **Stop delivery after conversion** to stop delivering creatives when the primary metric for the task is met.

   When delivery of the creatives stops, that same spot might switch to displaying creatives from another task. If there is no other task delivering a creative to that spot, then the spot's default creative is displayed. If there are no other tasks delivering content to that spot and there is no default content defined for that spot, then the spot is empty.

Set Secondary Metrics

A secondary metric measures other benchmarks that you are interested in. A task can have multiple secondary metrics. Each secondary metric can have only one data view or event.

Click **Add Secondary Metric** to add a secondary metric.

Modify Existing Metrics

You can change the settings for an existing metric.

Note: The action icons for a metric are only visible when the metric has focus. For example, a metric has focus when you tab to it or when you move your mouse over the metric.

- Click to update the metric details.
- Click to remove a metric.

View Usage Information

From the **Orchestration** ⇨ **Usage** tab, you can view which items use the task and the items that the task uses.

The ability to view dependencies between items enables you to see the items that a task depends on to work successfully. Usage information helps you identify how changes that you make to one item might affect another item.

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The Channel, Priority, and Type columns do not apply to activities and are therefore empty.

Items That the Task Uses

The second section shows items that the task uses.

- Click **Directly Related** to list the items that the task uses. For example, if a task uses a creative, the creative is included in the list.
- Click **All Related** to view directly related items as well as any items that those directly related items use. For example, you might see the creative that the task uses and the asset that is used by the creative.

  The list displays items with a Designing, Ready, or Active status. Click **Show Designing Status only** to display only items with a Designing status.

To open an item, click the item. To view item details and to open the item, click in the item's row.

Note: HTML assets that are the content source for mobile spot, web spot, and email creatives are not listed.

Schedule and Start Your Task

When you finish updating your task, you can mark the task ready, publish the task immediately, or set a schedule for the task.

Note: When you schedule a bulk email task, a bulk mobile push notification task, or a direct marketing task, allow a minimum of five minutes between the time you publish the task and the scheduled start time for the task to be active. This time delay is needed by the system to process the request.

On the **Orchestration** tab, take these actions:

- Click **No schedule** if you plan to publish the task manually.
- Click **Set a schedule** to set a time period that the task is active.
    - Select a time zone. For example, you might want to select a time zone that is different from the default if the task is targeted to a specific locale. By default, the time zone is the same as the time zone that is set for the tenant. If a valid time zone is not set for the tenant, the default time zone is UCT.
    - Click **Single occurrence** to specify a single time span that the task is active.
    - Select a start date and an end date for the task.

      Note: If you select **Single occurrence**, the start date cannot be edited after the task is published.
    - Click **Recurrence** to specify a recurring task. Click .

      Specify these details for a recurring schedule:
        - **Start time** is the start time for the first occurrence.
        - **Duration** specifies the amount of time that the content is available for each occurrence. For example, a task might start every week on Monday, and continue for four days.
        - **Frequency** specifies that the schedule for the recurrence. If you click **Weekly**, click the day for each occurrence. You can select multiple days in each week. If you click **Monthly**, select the numbered day or the weekday for the recurrence. For example, you can select the 10th day of each month or the second Tuesday of each month.

          Note: You can edit the weekly or monthly frequency after the task is published and the start date has passed. The recurrence must occur within the start and end dates.
        - **Range of recurrence** specifies the start and end dates, or that the recurrence continues without an end date.
    - **Extend metrics analysis** continues collecting data after the last occurrence. Select the number of days to extend data collection. The default value is 7 days. For example, if you use the default value, and the **Start time** is 9:00 PM, data collection continues until 9:00 PM seven days after the **End by** date.

      Customers might respond several days after the last occurrence. You can extend the time for data collection in order to more effectively measure task performance.

During the extended period of data collection, the status is Active - Metrics Only. The status changes to Complete when the **Extend metrics analysis** period is over.

- Select **Mark Ready** to change the status from Designing to Ready. A Ready status indicates that this item is ready to be published. When you are ready to promote an item from a Ready status to an Active status, click **Publish**.

  Note: When you publish an item, you are prompted to publish any dependent items that are marked Ready.

  Items with a Ready status can be changed back to a Designing status by clicking **Return to Designing**. Changing this status to Designing prevents the item from being published.

  Note: If your item has a Ready status and a start date, the item is not automatically published when the start date is reached. For example, if you are creating a task, it must be published in order for the start date to activate the task.

- Select **Mark Ready and Publish** to change the status from Designing to Active. Items with an Active status cannot be changed back to Designing.

Changes to a scheduled or active task are not automatically propagated to the published version of the task. You must republish the task after you save it to resolve the Out of Sync status. Otherwise, the task stays out of sync with the published version and the updates are not delivered.

When the end date of a task is reached, its status changes to Complete. Completed tasks cannot be modified. The task stops any associated data collection and makes the task's content unavailable. In addition, any unsaved changes are lost.

Note: A recurring schedule is not available if the task is included in an activity.

End the Task

While your task is running, it collects data and gathers information about progress toward your metrics. When enough progress is made that a confidence level of 75% for the lift value is reached, you can also see the recommended variant winner and any discovered segments for the variants. The **Insights** tab contains details about the variant's performance and the measurements for each variant.

End the task when you no longer need the task to run or you are ready to declare a winning variant. There are three ways to end an A/B task:

- Click **End** on the **Orchestration** tab.
- The end date that is specified in **Orchestration** ⇨ **Schedule Orchestration** has been reached.
- On the **Insights** tab, click **Declare Winner** and select a winning variant. When you declare a winner, a new task of the same type is created to ensure that content continues to be delivered to the spot. For more information, see “Creating Tasks from A/B Test Winners” on page 953.

Ending a task changes the status from Active to Complete. Completed tasks do not collect new data, do not deliver content to a spot, and cannot be modified. Any unsaved changes to the task are lost.

Note: To create a standard task from an open A/B test task that contains the same targeting, spot, and metrics, open the A/B test task and click ⋮. Select **Create task**, and then select the variant that you want to use.

About Multivariate Testing

Overview

Use multivariate testing to determine the effect of changing more than one spot in a set simultaneously. This testing differs from an A/B test, where only one variable is changed at a time.

For example, you create a spot set with four spots. Each of those spots is associated with three creatives. By creating a multivariate testing task, you can test all possible combinations of the three creatives in the four spots. Each combination is a variant, and in this case there are 81 possible combinations, or variants.

Note: Multivariate test tasks support a maximum of 200 variants.

Because testing all possible combinations is not always practical, multivariate test tasks can also be optimized. Optimized multivariate test tasks use analytics to determine what subset of variants are required so that the test can derive reliable conclusions.

Advantages of A/B and Multivariate Testing

During an A/B test, only one variable is changed at a time. For example, an A/B test might determine which image out of four possible images performs best in a spot. To do this, an A/B test randomly divides the target audience so that each audience subset sees one of the four images in the spot.

If you want to vary both the image and the text associated with it, you can perform several sequential A/B tests in order to isolate the effect of each change. In the first A/B test task, you could have the same text with different images. In the next A/B test, you might test the winning image with four different text colors.

Here are the disadvantages of sequential A/B tests:

- They require a lot of time.
- They cannot compare the effect of the interactions of the content.

Using a multivariate test task, you can run one test that changes both the image and the text at the same time.

Multivariate Test Optimization

You can design a multivariate task so that all possible combinations of content are displayed throughout the durations of the task. Each variant in a multivariate test task is tested and compared with all other variants in order to determine this information:

- which variant performs best (usually related to successful conversions)
- whether the creative displayed in one spot in your set influences the effect of what creatives are displayed in other spots

Even with a small number of spots and creatives, the number of variants grows quickly and can lead to an impractical traffic volume of impressions.

Different methods can be used to reduce the number of variants needed while maintaining the usefulness of the test. SAS has developed its own procedure to address this challenge and optimize multivariate test tasks. The OPTEX procedure enables businesses, research engineers, and scientists to overcome the practicality barrier of multivariate testing.

The data collected from the optimized subset of variants is used to build a model that predicts what would have happened if you had run the full set of variants. As a result, the optimized multivariate test can significantly decrease the number of impressions a test needs in order to complete. The decreased testing reduces the time that you have to wait for results.

Note: The predicted variants are denoted with an asterisk.

How Optimization Works

1. When you optimize a multivariate test task, the system calculates the total number of possible combinations, known as the full factorial. In the case of four spots each having three creatives, the total number of combinations is 81.

2. You might be able to eliminate some of the 81 variants for business reasons. Although eliminating some variants results in fewer than 81 combinations to test, the number of variants might still be too large to be practical. To address this challenge, you can optimize the task.

3. Customer Intelligence 360 uses the OPTEX procedure to determine the best subset of variants to test using the following actions:

   1. All of the variants that you selected to test are sent as input to OPTEX. For example, if you did not eliminate any of the 81 variants before clicking **Optimize**, then OPTEX uses the full factorial as input. If you eliminated six variants before clicking **Optimize**, then OPTEX uses the remaining 75 variants as input.

   2. OPTEX determines the minimum number of design points and compiles a list of the subset of variants that need to be tested.

   3. You approve the list of optimized variants and activate the task.

4. Each variant is displayed enough times to satisfy the minimum sample size requirement.
5. After the minimum sample size is satisfied for each variant, the data collected by the multivariate test task is fitted to a GLM/LogReg model. The model parameter estimates are then used to predict the likely outcomes for the untested variants.

The results from OPTEX are dependent on the following information:

- the type of model used

  Note: The model is fitted automatically by Customer Intelligence 360. However, more detailed model fitting parameters are available for interested users.

- whether both main interaction effects are used

  Note: In many cases, considering only main effects is sufficient for getting good results.

Creating a Web Multivariate Test Task

Create a task that can display all possible combinations of content so that you can determine which combination performs best. You can optimize a web multivariate test task, enabling analytics to reduce the number of combinations needed for testing.

Before You Begin

In order to test the effectiveness of different content combinations, a multivariate test task must meet these requirements:

- use a spot set that contains at least two spots.
  - avoid spot sets that display a subset of their spots on one web page. The analytics assume that all of the spots in the set are always available simultaneously.

    Note: To guarantee that all of the spots in a set are displayed simultaneously, the values for the spot location details must be identical across all of the spots in the set. Matching the spot location details enables analytics to run successfully on your A/B test or web multivariate test task.

  - Avoid spots that are used by another active A/B test task or web multivariate test task.
- have at least one spot in the set that has more than one creative.
- all spots in the set contain default content.

Select Content

1. From the navigation bar, click **Tasks**.
2. Click .
3. Select **Web Multivariate Test**.
4. Select the spot set where you want the content to be displayed.
5. Click **Create Task**.
6. On the **Task** ⇨ **Content** tab, complete these actions for each spot:
   1. Choose the message or creative for the spot.
   2. In the **Content Selection** tab, select all of the creatives that you want to be displayed in the spot. Instead of selecting an existing message or creative to add to the task, you can choose to create a message or creative. To create a message or creative, click **New Message** or **New Creative**. The message or creative that you create is automatically added to the task.

Generate Variants

1. Navigate to the **Variants** tab.
2. Click **Generate Variants** to list all possible combinations of creatives. Each combination of creatives is a variant in the list.
3. (Optional) To select a variant to set as a champion, enable **Designate a champion**. The champion is used as the benchmark that all other variants are measured against. If the test is run without denoting a champion variant, then the variants are measured against the best-performing variant.
4. (Optional) To select a variant to set as a control, enable **Designate a control**. The control variant displays the default content of each spot.

   Note: Control variants are not included in the optimization.

If your task does not have a control or champion variant, those variants that have the same conversion rate as the benchmark variant are denoted with two dashes.

Optimize Content

Testing all possible combinations is not always practical, because it can result in too many variants to test. A challenge of having more variants is that the test requires larger minimum sample sizes, which can increase testing time. By optimizing the task, Customer Intelligence 360 can use analytics to determine what subset of variants can be used in the test in order to derive reliable conclusions.

1. Navigate to the **Variants** tab.

2. Click **Optimize** to see which subset of variants the analytics is including in the task.

3. Click **Refine Variants** to manually include or exclude variants by changing the **Optimization Setting**.

   - Select **Include** to ensure that the variant is always part of the test.
   - Select **Exclude** to prevent the variant from being included in the test.
   - Select **Eligible** to allow analytics to determine whether the variant should be included in the test.

4. Refine the list of variants until you are satisfied with the total number of variants and the required sample size. When you are satisfied with the list of variants, click **Finish**.

Add a Target Audience

On the **Targeting** tab, set the criteria that define the target audience for the content that the task delivers.

On the **Eligible** page, you can specify which people to include in your target audience. On the **Exclusions** page, you can specify which people to exclude from your target audience.

Note the following rules about defining the target audience:

- If no criteria are added, the target audience includes everyone.
- When you create a target audience using demographic criteria such as city, age, gender, membership status, and so on, only the users who satisfy criteria based on their current data are included in the target audience.
- Previously defined segments, events, and data views can be selected as criteria.

  Note: You must define a login event type if you have tasks that depend on segments with data from logged-in users.

  > **TIP** The attributes of the events or data views added to the targeting criteria can be selected as values for personalization variables by navigating to **Content** ⇨ **Personalization**. For more information about delivering personalized content, see “Personalizing HTML Creatives” on page 694.

- You can use customer lists that have been imported from other sources, such as SAS Marketing Automation.
- When you add **Browser and Device** to your criteria, only the people who are using that browser or device during the current session are included in the target audience. For example, if you add Chrome as the browser, only the people who are using Chrome during the current session are eligible to be included in the target audience.
- When you add a spot attribute that contains a URL query string parameter, the value of that parameter needs to be decoded for multi-byte character sets (MBCS). If you are adding a URL query string, the value should be encoded for MBCS.

To add criteria:

1 Click **Eligible** or **Exclusions**.

2 Click + to add a criteria row.

3 In the **Specify criteria** box, click .

4 In the **Select Criteria** window, select the criteria to add.

To locate criteria, use these options:

- Click to display a hierarchical folder view of criteria. Click to display individual merge tags in alphabetical order.
- Click to expand all of the folders. Click to collapse all of the folders.
- Click to view details, if available, about the criteria.
- Search for criteria by entering the name in the **Search** field. Select criteria and click to display details.

5 Click **OK**.

6 If applicable, in the **Specify values** box, click and specify a value for the criteria.

For example, if channel is your selected criterion, you might specify a value of mobile or web. Whereas, there is no need to specify a value if a segment is selected.

7 Repeat steps 1-6 to add criteria.

8 Use these options to work with the criteria list:

- Click to view a summary of the criteria.
- Click to make a copy of the criteria. Copying criteria saves steps when you use the same criteria but supply different values.
- Click or to move criteria up or down in the list. The position determines the order in which the criteria are checked.
- Click to create a group for a set of criteria. Groups enable you to nest criteria.
- Click to delete criteria.

9 Select **All of the following** to include members who meet all of the criteria in a group. Or, select **Any of the following** to include members who meet one or more of the criteria in a group.

10 Click .

Set Metrics

About Metrics

After enough data has been collected, you can navigate to the **Insights** tab to see this information:

- the conversion rates for the variants that were included in the test
- the predicted conversion rate for any variants that were not included in the test

If there is a clear winner, you can select the winning variant and use it in a task. You might find that there are two or more variants that do not perform very differently from each other. In this case, you can create an A/B test task that uses a spot set to determine which of these variants performs best.

Set a Primary Metric

The primary metric measures conversions to determine the success of the task. There can be only one primary metric. You can either edit an existing primary metric or add a new one and then remove the previous metric.

1 Click **+**.

2 Select the criteria that you want to add. You can select an event view or a data view.

   For more information about events, see "User-Defined Events" on page 304. For more information about data views, see "About Data Views" on page 459.

3 If attributes are defined for the event or data view, select the attribute conditions that must be met. For example, for a Click Through metric, you can select a particular creative as an attribute condition. The primary metric would be a click-through response to that creative.

   Note: Attributes are joined by an AND operator. Make sure that you do not define conflicting attributes that result in a condition that cannot be met.

4 To mark this selection as a contact or response that can be tracked and used for reporting and future targeting, select **Classify this selection**. Classifying an event or data view enables you to compare contacts and responses across creatives and channels. You can personalize future messages and creatives. You can also use the information to segment customers. You can classify events and data views in both primary and secondary metrics.

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- Click to update the metric details.
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From the **Orchestration** ⇨ **Usage** tab, you can view which items use the task and the items that the task uses.

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On the **Orchestration** tab, take these actions:

- Click **No schedule** if you plan to publish the task manually.
- Click **Set a schedule** to set a time period that the task is active.
  - Select a time zone. For example, you might want to select a time zone that is different from the default if the task is targeted to a specific locale. By default, the time zone is the same as the time zone that is set for the tenant. If a valid time zone is not set for the tenant, the default time zone is UCT.
  - Click **Single occurrence** to specify a single time span that the task is active.
  - Select a start date and an end date for the task.

    Note: If you select **Single occurrence**, the start date cannot be edited after the task is published.
  - Click **Recurrence** to specify a recurring task. Click .

    Specify these details for a recurring schedule:
    - **Start time** is the start time for the first occurrence.
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days. For example, if you use the default value, and the **Start time** is 9:00 PM, data collection continues until 9:00 PM seven days after the **End by** date.

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Note: A recurring schedule is not available if the task is included in an activity.

End the Task

Ending a task changes the status from Active to Complete. Completed tasks do not collect new data, do not deliver content to a spot, and cannot be modified. Any unsaved changes to the task are lost.

Setting Up Variants

An A/B test task must contain at least two variants. Navigate to the **Content** tab and click the **Variants** tab to see a list of the variants that are associated with the task.

Note: You must add at least two variants to an A/B test task in order to publish it.

You can add variants, delete variants, rename variants, set the distribution of the variant frequency, or mark a variant as a champion or control.

- Enable **Optimize distribution to favor winning variant** if you want the system to change the distribution of variants as the A/B test progresses. Optimizing the test ensures that the best-performing variant is seen by a larger portion of the audience.

  Note: Variant distribution changes only when there is enough data to identify the best-performing variants.

- Enable **Designate a champion** to include a champion variant in your A/B test. The variant that is designated as the champion is used as the benchmark for the test. The performance of the remaining variants is compared with the performance of the champion variant.
- Enable **Designate a control** if you want to include a control variant in the A/B test. If the control is enabled, then the default creatives for the spot or spot set are displayed as the control variants.
- Click ✚ to add a new variant.
- Select the variant that you want to mark as the champion and click . The champion automatically gets 70% of the distribution frequency.

  Note: Changing the champion resets all of the frequencies to the default values and assigns the largest value to the champion.

- Click to set the variant frequency. The variant frequency determines the percentage of people in the test that receive the variant. After the variant is assigned to a visitor, the visitor sees that variant every time. By default, 70% is given to the champion and 30% is given to the first variant. When you add new variants, the system automatically divides the last variant's distribution in half. The sum of the frequency of all of the variants must equal 100%.
- Select the variant that you want to delete and click . Deleting a variant resets the variant frequencies.
- Click ⋮ for more actions, such as renaming a variant or resetting the distribution.

On the **Content** tab, update these properties:

- Click to open the **Spot** tab. Click to change the spot where your message is displayed.
- Click to open the **Messages** tab. Click to add a message for the variant that is being displayed. In the **Selected Creative** section, choose which creative to use as the variant. If available, you can also click **Select Message** and choose the message that contains the creative that you want to add.
- Click to open the **Impression Limits** tab so that you can limit the number of times that a customer sees your variant.
  - Select **Limit total impressions per visitor** to specify the total number of times a creative is displayed to a visitor. This limit is valid for the duration of this task.
  - Select **Limit impressions per visitor by period** ⇨ **Time period** to specify the maximum number of impressions a visitor sees during a specified time interval (for example, minutes, hours, days, or months).
  - Select **Limit impressions per visitor by period** ⇨ **Session** to limit the number of impressions a visitor sees while interacting with your website. By default, the session is set to expire after 30 minutes of inactivity, but you can contact a SAS representative to modify this value.

Identifying the Winning Variant

You can find details about variant performance on the **Insights** tab, including information about conversion rate, lift, count, and confidence for each variant. The count specifies the number of unique users who have seen only the variant that is associated with the count. Users who see multiple variants during an A/B test are excluded from the variant count.

Note: The variant count differs from the spot count. The spot count represents the number of users who have viewed the spot, regardless of which content displayed the spot.

In addition, you can see which data views make up your metrics.

The overall winner is the variant that performs best based on the data views that make up the primary metric. Typically, the variant with the greatest lift over the champion is recommended as the winner. The champion is recommended as the winner if the other variants have a negative lift.

The variant with the highest measured conversion rate is the baseline. In order for the variant to be declared the winner, these conditions must be met:

- The unique visitor count meets or exceeds the estimated sample size.
- The lift, when the variant is the challenger against every other variant, meets or exceeds the threshold.
- The confidence for every pair involving the variant meets or exceeds the threshold. The threshold defaults to 90%. For information about changing the default threshold in Analytic Settings, see “Test” on page 104.

In addition to the overall variant winner, the analytics might find that a different variant performs better for a subset of your target audience. This subset of people is known as a discovered segment. Variants and any corresponding discovered segments are listed on the **Insights** tab, along with a segment profile. The segment profile contains information about the discovered segment, including these details:

- a count of how many people in the task match the segment criteria.
- a list of criteria that distinguish the discovered segment from all other people that accessed the creatives being tested. The criteria are listed in order from most distinguishing to least distinguishing.
- user-defined criteria that were made available to segment profiles when the data was imported into the data hub.

Note: The criteria that are displayed in a segment profile are identified when your customer data is imported into SAS Customer Intelligence 360.

The **Insights** tab denotes the champion and overall variant winner for a primary metric. The champion is denoted with a . The overall variant winner is denoted with a .

The system recommends a winner, but you must click **Declare Winner** and select the variant that you want to mark as the winner. When a variant is declared a winner, the test task ends, although you can create a task that continues delivering the winning creative.

Creating Tasks from A/B Test Winners

Declaring a winner ends the A/B test task. To ensure that a creative continues to be delivered to the A/B test task's spot, create a new task with the winning variant. The new task must be of the same type. For example, a Web task is created from the winning variant of a Web A/B test task.

After you click **Declare Winner** and select the variant that you want to mark as the winner, click **Create Task**. The new task that is created contains the winning creative and the spot from the A/B test task. The targeting is automatically defined for the new task based on whether you are creating a task from an overall winner or a discovered segment. If you are creating a task from an overall winner, then the targeting criteria of the new task match the targeting criteria of the overall winner.

Creating Tasks from Web Multivariate Tasks

You can create either standard or A/B tasks from the variants used in a web multivariate test task. When you create a task from a variant, the multivariate test task ends and the new task delivers content to the same spots that were used by the multivariate test task. Using variants is a quick way to create tasks that already contain the right content and use the right spots.

1. Navigate to the **Insights** tab.
2. Click **Use Variants**.
3. Choose the task type and the variants that you want to use.
   - Select **A/B Test task** if you need to test a subset of variants from the multivariate test task. Sometimes, a multivariate test task has similar results for multiple variants. In this case, it can be helpful to follow a multivariate test with an A/B test that uses only the similarly performing variants.
   - Select **Declare winner and create standard task** if you are ready to create a web task that delivers content from one variant.
4. Click **Define the tasks** to name the task. By default, tasks are created with an active status so that content is automatically published to the spots. If you need to make updates to the task before it is published, deselect **Automatically publish new tasks**.

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Monitoring Your Test

Finding Test Result Data

The **Insights** tab contains information about your task, including a summary of how the test and its variants are progressing, details about metric performance, and reports. Use the information available on this tab to monitor your test task and identify the best-performing set of variants.

Note: If you do not see any data on the **Insights** tab, your role might not have sufficient privileges to access this information.

Summary

The **Summary** tab displays general information about the test and its variants, giving you an at-a-glance view of how the test is progressing. Most of the data available here is based on unique users. By default, this page displays data for the primary metric. However, data for other metrics is available in the **Cumulative Metrics Per Variant** section.

Task Details

You can see details about the test task, such as the following information:

- status of the task
- dates, such as the date on which the task was last published, the date of the most recent update, and how long the task has been active
- population counts, such as the number of unique users that have been included in the test and an estimate of the minimum sample size

Variant and Metric Details

On the **Summary** tab, you can also see some details about variant and metric performance, such as the variant winners and cumulative metrics per variant.

Note: The **Performance** tab contains more details about each metric and variant.

You can use the graphs in the **Cumulative Metrics Per** section to see how some of the metrics are performing. By default, the graph displays the conversion rate for the primary metric. However, you can select other metrics from the drop-down list. Here are some tips to remember when you are using the Cumulative Metrics Per Variant graphs:

- Changing the metric does not update the data displayed in other parts of this tab. The information that is displayed in other parts of this tab still reflects the data for the primary metric.
- Most of the metrics that are available in this list are user-based metrics. For more information about user-based and session-based metrics, see "About Test Metrics" on page 958.
- You can select **Show value markers** to add data points to the lines in the graph.
- You can refine the time period that the graph displays by moving the sliders below the graph.
- If data is missing for a metric, the prerequisites for that metric might not be met.

Performance

Performance is where you specify the primary and secondary metrics while you are designing your test. As the test progresses, details about all available metrics and variant performance are updated on this tab. Most of the data available on this tab is user based. The user-based data includes only unique users.

You can find the following information on the **Performance** tab:

- the overall winner for a primary metric.
- the champion variant and recommended winning variant.
- a discovered segment. If the system finds a variant that performs better for a subset of your target audience, that variant is denoted as a discovered segment. For more information, see "About Segment Discovery" on page 475.
- additional e-commerce metrics. All e-commerce metrics are listed by default, even if the prerequisites for analysis are not met. However, you can hide these additional metrics by clicking **Customize View**.

From **Performance** you can also declare a winner after the test is active by clicking **Declare Winner**. When you declare a winner, the test task ends and a task is created to deliver the winning content. If you declare a winner for a web A/B test task, a standard web task is created. If you declare a winner for a mobile spot A/B test task, a mobile spot task is created. For more information, see "Creating Tasks from A/B Test Winners" on page 953.

Note: If you declare a winner for a test that contains a discovered segment, you have the option of creating a task with a target audience that matches the discovered segment.

Reports

The **Reports** tab displays e-commerce metrics that enable you to evaluate the effectiveness of your A/B test by session and to determine how your A/B test affects revenue. The following reports are available:

- The Performance by Session report displays how variants are performing by session metrics. For more information, see "Performance by Session Report" on page 964.
- The Revenue Results report displays how the A/B test affects revenue received and revenue abandoned. For more information, see "Revenue Results Report" on page 968.

  Note: This report is available for web A/B test tasks only.
- The Session Results report displays how key metrics are performing by session. For more information, see "Session Results Report" on page 969.
- The User Results report displays how variants are performing for total users. For more information, see "User Results Report" on page 970.

  Note: Results for unique users are on the **Summary** and **Performance** tabs.

Use these links to understand the reports and their data:

- Select **Get more report details** for information about how to use the report and how to read and view the data.
- Select **View Metric Formula** to display the definition and the formula for each metric.
- Select **Compare Variant** to compare the leading variant to the other variants in the A/B test.

About Test Metrics

Metrics measure the user actions that the system can detect, such as a person clicking a spot on a web page. SAS Customer Intelligence 360 analyzes the metric data so that you can use it to understand the performance of your test and its variants.

For a definition of a metric and the different categories of metrics, see "Key Testing Concepts" on page 918.

Overview

All A/B test tasks, MVT tasks, and A/B activity path tests include the following metrics:

- one primary metric that measures conversions to determine the success of the test. This metric is user based and is required for all A/B and MVT tests.
- a secondary metric that measures other benchmarks that you are interested in. This metric is optional and is also user based. You can add multiple secondary metrics to your A/B and MVT tests.

  Note: Each secondary metric can have only one data view or event associated with it.

In addition, web A/B test tasks and mobile spot A/B test tasks include e-commerce metrics that analyze different types of data related to e-commerce, such as data about revenue, virtual carts, time on a site or mobile application, and page views. These metrics contain user-based and session-based data.

User-Based Metrics

User-based metrics on the **Insights** ⇨ **Performance** and **Insights** ⇨ **Summary** tabs show results calculated based on unique users. User-based metrics are calculated across all sessions, beginning with the first variant impression. The user-based metrics on these tabs account for the same person accessing something more than one time by removing duplicate users. For example, if you visit a site twice, you are counted as one user.

In addition, the User Results report on the **Insights** ⇨ **Reports** tab displays how key metrics are performing by total users in your A/B test task. The user-based metrics in this report include duplicate users. For example, if you visit a site twice, you are counted as two users.

Session-Based Metrics

Session-based metrics show results based on all visits to your site or mobile application and are also calculated beginning with the first variant impression. Session-based metrics are calculated using the details defined on the **General Settings** ⇨ **Data Management** ⇨ **Page and Session** page. For example, by default a session lasts 30 minutes. However, an administrator might have changed this setting to 24 hours on the **Page and Session** page.

For more information about these settings, see "Page and Session" on page 34.

You can find session-based metrics on the following tabs:

- **Insights** ⇨ **Reports**
- **Insights** ⇨ **Summary**

Primary and Secondary Metrics

In A/B and MVT tests, primary and secondary metrics are used to measure the performance of your test and other benchmarks that you are interested in. These are user-based metrics that are calculated based on unique users. User-based metrics are calculated across all sessions, beginning with the first variant impression.

To learn more about metrics and other concepts referenced in this topic, see "Key Testing Concepts" on page 918.

Prerequisites for Primary and Secondary Metrics

When you create a metric, you select events or data views as criteria. As your tests run, SAS Customer Intelligence 360 reports data about your metrics so that you can see how the test is performing.

To add or view data for primary and secondary metrics, a corresponding event or data view that tracks the data for the action that your metric is measuring must exist. For example, if your primary metric is tracking page views, then a page view event must exist in SAS Customer Intelligence 360. In some cases, the data that you are interested in might come from an event attribute. In that case, the event and its corresponding attribute must exist in the system.

Primary Metric and Conversion Rate

The primary metric measures conversions to determine the success of the task or activity path. The conversion rate is the percentage of unique users who meet the primary metric. The conversion rate is calculated using this formula:

```
(total number of users that satisfied the primary metric / total
number of users) x 100
```

For example, the primary metric for the A/B task is a click-through metric on your banner, and there are 100 unique users that visited your site. Of the 100 unique users, 68 clicked the banner. The `total number of users that satisfied the primary metric` is 68. The `total number of users` is 100. The conversion rate is 68%.

Before SAS Customer Intelligence 360 can determine whether a winning variant can be identified for a primary metric, a minimum estimated sample size must be met.

Primary metrics are required for all A/B tasks, MVT tasks, and A/B tests on activity paths. In addition, a test can contain only one primary metric. A **Click Through** metric is the default primary metric for web A/B, mobile spot A/B, and MVT test tasks. If you are testing activity paths, there is no default primary metric.

The primary metric is defined in these locations:

- on the **Insights** ⇨ **Performance** tab of your A/B or MVT task
- on the **Insights** tab of the **A/B Test Node** for the paths that you are testing in your activity

  Note: In addition to a primary metric for an **A/B Test Node**, there is a primary metric for the activity. The primary metric for the activity is defined on the **Insights** tab of the activity and measures the success of the activity, not the A/B path test.

Secondary Metrics

Secondary metrics measure other benchmarks that you are interested in and are optional. You can add multiple secondary metrics to your A/B and MVT tests. However, each secondary metric can have only one data view or event. Secondary metrics are defined in these locations:

- on the **Insights** ⇨ **Performance** tab of your A/B or MVT task
- on the **Insights** tab of the **A/B Test Node** for the paths that you are testing in your activity

  Note: You can also define secondary metrics for your activity. The secondary metrics for the activity are defined on the **Insights** tab of the activity and measure benchmarks related to the activity, and not the A/B path test.

E-commerce User Metrics

In addition to primary and secondary metrics, web and mobile A/B tasks have additional e-commerce metrics that you can use to better understand test results. These additional metrics are available on the **Insights** tab of A/B test tasks and are all user-based metrics.

Prerequisites

In order to gather the data that is required to analyze results for these additional metrics, the following items are required:

- a license for SAS 360 Discover.

  Note: The e-commerce metrics that are listed here use information that is available only from SAS 360 Discover. However, SAS 360 Discover is not required for primary and secondary metrics.

- some of the e-commerce metrics require events to be created before data can be collected. More information about the specific event requirements is included in the details of each metric.

Note: If you do not see data for a metric and the previous prerequisites have been met, a specific metric might not be available for your task type. For example, not all metrics are available for mobile spot A/B test tasks. More information about availability is included in the details of each metric.

Average Add to Cart

This metric represents the average number of times that a unique user adds an item to the cart. This metric requires an Add to Cart event and is calculated using the following formula:

```
total number of add-to-cart actions / total number of users
```

The `total number of add-to-cart actions` is equal to the number of times that a user adds a product to the cart. In other words, this is the number of times that the add-to-cart event fired. For example, you add items to your cart across two different sessions. Someone else adds items to their cart in one session. The `total number of add-to-cart actions` is 3 and the `total visitor count` is 2.

Note: This metric does not track the number of items added to a cart. So if you added multiple items at one time, that counts as one add-to-cart action.

This metric requires that an add-to-cart event exist in the system. However, the add-to-cart event does not require additional attributes in order for this metric to work. For more information, see “Creating Add to Cart Events” on page 310.

Average Order Value

This metric represents the average revenue that is generated by each order. This metric is calculated using the following formula:

`total revenue generated / total number of orders.`

The **`total revenue generated`** is equal to the total income that was generated by all of the orders made on your site. For example, you purchase USD 50 worth of merchandise in two different orders, and someone else makes a purchase of USD 10 in one order. The **`total revenue generated`** is USD 60 and the total number of orders is 3.

This metric requires that a purchase view event exist in the system. However, the purchase view event does not require additional attributes in order for this metric to work. For more information, see “Creating Purchase View Events” on page 325.

Note: This metric is available for web A/B test tasks.

Average Page View

This metric represents the average number of page views by a unique user. This metric is calculated using the following formula:

`total pages viewed / total number of users`

The **`total pages viewed`** accounts for all page views, including page views of the same page. For example, you view the page two times and someone else views the page once. The **`total pages viewed`** is 3 and the **`total number of users`** is 2.

Note: This metric is available for web A/B test tasks.

Average Time On Site

This metric represents the average amount of active time, in seconds, that a unique user spends on your site. This metric is calculated using the following formula:

`total active time on site (seconds) / total number of users`

The **`total active time on site`** is the total active amount of time that all unique users spent on your site. For example, you spend 1,800 seconds on the site. Someone else spends 600 seconds on the site. The **`total active time on site`** is 2,400 seconds and the **`total number of users`** is 2.

Note: This metric is available for web A/B test tasks and mobile spot A/B test tasks.

New User Conversion

This metric represents the percentage of unique users who are first-time users and who also meet the primary metric for the task. The primary metric is defined on the **Insights** ⇨ **Performance** tab of the task. This metric is calculated using the following formula:

```
(total number of first-time users that satisfied the primary metric /
total number of first-time users) x 100
```

For example, the primary metric for the A/B task is a click-through metric on your banner, and there are 100 first-time users who visited your site. Sixty-eight of the new users clicked the banner. The `total number of first-time users that satisfied the primary metric` is equal to 68. The `total number of first-time users` is equal to 100.

If you are identified as a new user when the task delivers content to you, then you are categorized as a new user for the duration of the task.

Note: This metric is available for web A/B test tasks and mobile spot A/B test tasks.

Orders Per User

This metric represents the average number of orders that a unique user makes on your site. This metric is calculated using the following formula:

```
total number of orders / total number of users
```

The `total number of orders` is equal to the total number of orders that all unique users submitted. For example, you submit two different orders, and someone else submits three orders. The `total number of orders` is 5 and the `total number of users` is 2.

This metric requires that a purchase view event exist in the system. However, the purchase view event does not require additional attributes in order for this metric to work. For more information, see “Creating Purchase View Events” on page 325.

Note: This metric is available for web A/B test tasks.

Revenue Per User

This metric represents the average revenue that a unique user generates on your site. This metric requires that a purchase view event exist in the system. This metric is calculated using the following formula:

```
total revenue generated / total number of users
```

The `total revenue generated` is equal to the total income that is generated on your site by all unique users. For example, you purchase USD 50 worth of merchandise on two occasions and a second person purchases USD 10 worth of merchandise at one time. The `total revenue generated` is USD 60 and the `total number of users` is 2.

This metric requires that a purchase view event exist in the system. However, the purchase view event does not require additional attributes in order for this metric to work. For more information, see "Creating Purchase View Events" on page 325.

Note: This metric is available for web A/B test tasks.

E-commerce Session Metrics

Web A/B test tasks and mobile spot A/B test tasks have additional e-commerce metrics that enable you to evaluate how session performance and revenue are affected by the test task. These metrics are available on the **Insights** ⇨ **Reports** tab of A/B test tasks.

Prerequisites

In order to gather the data that is required to analyze results for these additional metrics, the following items are required:

- a license for SAS 360 Discover.

  Note: The e-commerce metrics that are listed here use information that is available only from SAS 360 Discover. However, SAS 360 Discover is not required for primary and secondary metrics.

- some of the e-commerce metrics require events to be created before data can be collected. More information about the specific event requirements is included in the details of each metric.

Note: If you do not see data for a metric and the previous prerequisites have been met, a specific metric might not be available for your task type. For example, not all metrics are available for mobile spot A/B test tasks. More information about availability is included in the details of each metric.

Performance by Session Report

Using the Report

The Performance by Session report displays how variants are performing by session metric.

For more information about using the report and the data in the report, click **Get more report details**. For each metric on this tab, click the **View Metric Formula** link to display the definition and the formula for the metric. Select **Compare Variant** to compare the leading variant to the other variants in the A/B test.

Select a date from the menu at the top of the report. If you do not select a date, the data is summarized for all dates.

Select the following tabs to display information:

- Click the **Overview** tab to determine which variant is leading for each metric.
- Click the **Metric Results** tab to track the performance of each variant.

Note: Confidence values can fluctuate until the required sample size is met. The best practice is to wait until the test is complete and use the confidence value in combination with the size of the difference to determine whether a result is reliable.

Metrics

Session-based metrics show how your variants are performing by session, as well as determine the confidence value that a variant will continue to be selected as the leading variant. These metrics are available from the **Overview** tab.

Primary Metric (Conversion Rate)

This metric represents the percentage of sessions where a user satisfies the primary metric.

Note: The primary metric for the test is available on the **Insights** ⇨ **Performance** tab of the A/B test task. The metric on the **Performance** tab is user based.

The conversion rate is an indicator of the success of the session. Whereas every conversion in a session is captured, this metric counts only one conversion per session. This metric is calculated using the following formula:

```
(total number of sessions with conversions / total number of sessions)
x 100
```

For example, your primary metric is a user signing up for email updates. Of 100 sessions for your site, 25 of those sessions had one user sign up for email updates. In 10 sessions, two users signed up for email updates. The `total number of sessions with conversions` equals 35 and the `total session count` equals 100.

Note: This metric is available for mobile spot A/B test tasks and web A/B test tasks.

Add to Carts Per Session

This metric represents the average number of add-to-cart actions for each session. This metric requires an Add to Cart event and is calculated using the following formula:

```
total number of add-to-cart actions / total number of sessions
```

The `total number of add-to-cart actions` equals the number of times that products are added to the cart in a session. In other words, this is the number of times that the add-to-cart event fires. For example, you add items to your cart across two sessions. Another user adds items to their cart two times in a session. The `total number of add-to-cart actions` equals 4 and the `total number of sessions` equals 3.

Note: This metric does not track the number of items added to a cart. So if you added multiple items at one time, that counts as one add-to-cart action.

This metric requires that an add-to-cart event exist in the system. However, the add-to-cart event does not require additional attributes in order for this metric to work. For more information, see "Creating Add to Cart Events" on page 310.

Note: This metric is available for web A/B test tasks.

Bounce Rate

This metric represents the percentage of sessions where users exit your site after viewing only one page or resource. This metric is calculated using the following formula:

`(total number of bounced sessions / total number of sessions) x 100`

For example, of the 100 sessions for your site, users in 30 of those sessions landed on one of your site pages but did not click anything or navigate to any other pages. The `total number of bounced sessions` equals 30 and the `total number of sessions` equals 100.

Note: This metric is also available on the **Insights** ⇨ **Performance** tab. This metric is available for web A/B test tasks.

New User Conversion Rate

This metric represents the percentage of sessions where new users meet the primary metric in their first session.

Note: The primary metric for the test is available on the **Insights** ⇨ **Performance** tab of the A/B test task. The metric on the **Performance** tab is user based.

This metric is calculated using the following formula:

`(total number of sessions with a new user conversion / total number of sessions with new users) x 100`

For example, the primary metric for the A/B test task is a click-through metric on your banner. Of the 100 sessions with new users to your site, 68 sessions had at least one new user who satisfied the primary metric in their first session. The `total number of sessions with a new user conversion` equals 68. The `total number of sessions with new users` equals 100.

If you are identified as a new user when the task delivers content to you, then you are categorized as a new user for the duration of the task.

Note: This metric is available for mobile spot A/B test tasks and web A/B test tasks.

Orders Per Session

This metric represents the average number of orders for each session. This metric is calculated using the following formula:

`total number of orders / total number of sessions`

The `total number of orders` equals the total number of orders that are submitted in all sessions. For example, you submit two orders in a session, and another user submits three orders in another session. The `total number of orders` equals 5 and the `total number of sessions` equals 2.

This metric requires that a purchase view event exist in the system. However, the purchase view event does not require additional attributes in order for this metric to work. For more information, see “Creating Purchase View Events” on page 325.

Note: This metric is available for web A/B test tasks.

Page Views Per Session

This metric represents the average number of page views in each session. This metric is calculated using the following formula:

`total pages viewed / total number of sessions`

The `total pages viewed` accounts for all page views, including page views of the same page. For example, you view the page two times in a session and you view the same page again in another session. The `total pages viewed` equals 3 and the `total number of sessions` equals 2.

Note: This metric is available for web A/B test tasks.

Revenue Per Order

This metric represents the average revenue that is generated by each order. This metric is calculated using the following formula:

`total revenue generated / total number of orders`

The `total revenue generated` equals the total income that was generated by all of the orders that were made on your site. For example, your site receives an order for a purchase of USD 30, a second order for a purchase of USD 50, and a third order for a purchase of USD 10. The `total revenue generated` equals USD 90 and the `total number of orders` equals 3.

This metric requires that a purchase view event exist in the system. However, the purchase view event does not require additional attributes in order for this metric to work. For more information, see "Creating Purchase View Events" on page 325.

Note: This metric is available for web A/B test tasks.

Revenue Per Session

This metric represents the average revenue that is generated for each session. This metric is calculated using the following formula:

`total revenue generated / total number of sessions`

The `total revenue generated` equals the total income that is generated on your site for all sessions. For example, you purchase USD 50 worth of merchandise in a session and you purchase USD 10 worth of merchandise in another session. The `total revenue generated` equals USD 60 and the `total number of sessions` equals 2.

This metric requires that a purchase view event exist in the system. However, the purchase view event does not require additional attributes in order for this metric to work. For more information, see "Creating Purchase View Events" on page 325.

Note: This metric is available for web A/B test tasks.

Time On Site Per Session

This metric represents the average amount of time, in seconds, that was spent on your site for each session. This metric is calculated using the following formula:

`total time on site (seconds) / total number of sessions`

The `total time on site (seconds)` equals the total amount of time that was spent on your site for all sessions. For example, you spend 1,800 seconds on the site in one session, and another 600 seconds on the site in a second session. The `total time on site (seconds)` equals 2,400 seconds and the `total number of sessions` equals 2.

Note: This metric is available for web A/B test tasks. Mobile spot A/B test tasks use `total time on app (seconds)` for this metric.

Revenue Results Report

Use the Revenue Results report to determine how key metrics affect revenue.

Use the date slider to specify the range of dates for the data that you want to see. The dates are the beginning dates and end dates for the data that is available for the test task. For more information about using the report and the data in the report, click **Get more report details**.

Note: This report is available for web A/B test tasks only.

Select the following tabs to display information:

- Click the **Overview** tab to display the total revenue for key metrics in your web A/B test task.

  For each metric on this tab, click the **View Metric Formula** link to display the definition and the formula for the metric. The following metrics are displayed on this tab:

  - Revenue received is the total amount of revenue that is generated.
  - New user revenue is the total amount of revenue that is generated by new users.
  - Returning user revenue is the total amount of revenue that is generated by returning users.
  - Revenue abandoned is the total amount of revenue from carts that are abandoned during the session. A cart is considered abandoned when the user abandons the cart after viewing the cart, after checking out, or after beginning the purchase activity.
  - Revenue per order is the average amount of revenue that is generated for each order.
  - Revenue per session is the average amount of revenue that is generated for each session.
- Click the **Revenue Ranks** tab to display the variants, dates, browser types, and devices with the highest revenue that was received and abandoned.
- Click the **Revenue Received/Abandoned** tab to display how shopping behavior resulted in revenue that was received or abandoned for each variant.
- Click the **Revenue Cycle** tab to display the sequence of steps a user takes to convert to a sale and the revenue generated from that sale.
- Click the **Revenue Amounts** tab to display which variant, user type, device, and browser generated the most revenue.
- Click the **Revenue Over Time** tab to display how the variants, user types, devices, and browsers generated revenue over time.

- Click the **Browsers** tab to display the browsers and the revenue that was generated using each browser.
- Click the **Devices** tab to display the device types and the revenue that was generated using each device.

Session Results Report

Use the Session Results report to display how key metrics are performing by session.

Use the date slider to specify the range of dates for the data that you want to see. The dates are the beginning dates and end dates for the data that is available for the test task. For more information about using the report and the data in the report, click **Get more report details**.

By default, the maximum session duration is 12 hours and a session times out after 30 minutes. For more information, see “Configuring SAS Customer Intelligence 360” on page 13.

Select the following tabs to display information:

- Click the **Overview** tab to display how key metrics performed in the sessions in the A/B test task.

  For each metric on this tab, click the **View Metric Formula** link to display the definition and the formula for the metric. The following metrics are displayed on this tab:

  - Sessions is the total number of sessions. A session is the time a user is active. The session ends after a given time period or when the user becomes inactive for a given time period. This metric is available for web A/B test tasks and mobile spot A/B test tasks.
  - Impressions per session is the average number of impressions for each session. This metric is available for web A/B test tasks and mobile spot A/B test tasks.
  - Revenue per session is the average amount of revenue that is generated for each session. This metric is available for web A/B test tasks.
  - Bounce rate is the percentage of sessions where users exit the site after viewing only one page or resource. This metric is available for web A/B test tasks.
  - Average session duration is the average amount of time in seconds for each session. This metric is available for web A/B test tasks and mobile spot A/B test tasks.
  - Page views per session is the average number of pages viewed for each session. This metric is available for web A/B test tasks.
  - Add to carts per session is the average number of add-to-cart actions for each session. This metric is available for web A/B test tasks.
  - Orders per session is the average number of orders for each session. This metric is available for web A/B test tasks.
- Click the **Session Ranks** tab to display the best-performing and lowest-performing variant, date, browser type, and device based on session count.

- Click the **Revenue Received/Abandoned** tab to display the pattern of shopping behavior and the revenue that was received or abandoned for each variant.

  Note: This tab is available for web A/B test tasks only.

- Click the **Session Counts** tab to display which variant, user type, device, and browser generated the most sessions.
- Click the **Sessions Over Time** tab to display how the variants, user types, devices, and browsers generate sessions over time.
- Click the **Browsers** tab to display the browser types and the number of sessions that were generated using each browser.
- Click the **Devices** tab to display the device types and the number of sessions that were generated using each device.

User Results Report

Use the User Results report to display how key metrics are performing by total users in your A/B test task. The user-based metrics in this report include duplicate users. For example, if you visit a site twice, you are counted as two users.

Note: Results for unique users are on the **Insights** ⇨ **Summary** and **Insights** ⇨ **Performance** tabs. The user-based metrics on these tabs account for the same person accessing something more than one time by removing duplicate users. For example, if you visit a site twice, you are counted as one user.

Use the date slider to specify the range of dates for the data that you want to see. The dates are the beginning dates and end dates for the data that is available for the test task. For more information about using the report and the data in the report, click **Get more report details**.

Select the following tabs to display information:

- Click the **Overview** tab to see how key metrics performed by total users in the A/B test task.

  For each metric on this tab, click the **View Metric Formula** link to display the definition and the formula for the metric. The following metrics are displayed on this tab:

  - Impressions delivered is the total number of times that a variant is delivered.
  - Impressions viewable is the total number of times that a variant is delivered and viewable.
  - Conversions is the total number of times that users satisfy the primary metric.

- Click the **Conversion Ranks** tab to display the best-performing and lowest-performing variants, dates, devices, and browser types based on conversions.
- Click the **Impressions/Conversions** tab to display the pattern of user behavior by impressions delivered, impressions viewable, and conversions for each variant.
- Click the **Cumulative Impressions/Conversions** tab to display the cumulative count of conversions, impressions delivered, and impressions viewable for each variant.
- Click the **Conversion Counts** tab to display which variant, device, and browser generated the most conversions.

- Click the **Conversions Over Time** tab to display the pattern of conversions by variant, device, and browser over time.
- Click the **Browsers** tab to display the total conversions by browser type and the pattern of conversions that were generated using each browser over time.
- Click the **Devices** tab to display the total conversions by device type and the pattern of conversions that were generated using each device over time.

PART 19

Appendixes

Appendix 1

Troubleshooting

Assets and Creatives

The following issues are related to data asset management or creatives.

File Size

The maximum file size for an asset is 10 MB. An error message appears if the file size is larger than 10 MB.

Add Assets to a Message

When adding the content that makes up your creative, you can edit the HTML source, embed content from a URL, or import an existing asset.

If you enter the HTML source code for your creative and the creative contains a reference to an external resource such as an image, CSS file, or JavaScript file, then that resource must be publicly accessible. Otherwise, the creative does not render properly.

If you copy the HTML from one creative to another, be sure to also select the asset from the repository for the asset to render properly.

Call-to-Action Link for Creatives in an Email

If you specify a call-to-action link for a content block in an email task, all of the elements in the creatives that are contained within the content block are clickable and direct the recipient to the specified URL. However, if you specify a call-to-action link in the content block, the creatives must not contain any nested hyperlinks. Usage of nested hyperlinks is not recommended because they might result in unpredictable behavior of the email client.

Suppose that you do not want all of the elements in the creative to be clickable. Instead, you want to provide a call-to-action link to specific creatives in a content block or specific elements in a creative. Insert the URLs in the HTML for the creative, and do not populate the call-to-action link field for the content block in the email task.

Expired Assets

If you set expiration dates for assets, you can identify expired assets by prominent visual indicators in asset lists and open assets. Most asset operations, such as downloading files or viewing previews, are disabled for expired assets.

Note: You can batch update a group of assets if all of the assets have an expired status. However, you cannot batch update a group of assets if some assets have an expired status and some have an active status.

You can filter asset lists by the expiration status—either expired or unexpired. Filtering enables you to easily generate a list of all expired assets or only a list of active assets. You can reactivate an expired asset by modifying the asset expiration date.

Delete Assets

You cannot delete an asset that is being used in a creative.

Personalized Creatives in an Email

If you add personalization criteria for a creative in a content block, you must not reuse the personalized creative in another content block to ensure that personalized targeting is executed correctly. Otherwise, recipients in a segment might not receive personalized creatives, even though you specified personalization criteria for the creatives in the content block.

No Usage Information for HTML Template Type of Asset

You have used an HTML template from the Assets repository in an email task, but the template is not listed in the usage information for the task.

When you save an email template as an asset, the template can be used by another task. However, any change to the email template will not be reflected in the tasks that use the template. That is because a task uses a tear-off copy of the email template instead of the original file, which was saved as an asset. The original file is stored in Assets. So, if you navigate to **Orchestration** ⇨ **Usage**, you cannot view the email template that is used by the task.

Proxy Service Interference with GEO Tags

Using a proxy service might interfere with targeting on GEO tags in a creative. If you notice that your geo-location services are showing a different location, check your proxy service as it might affect your address.

Displaying Assets from a Third-Party CMS

An asset for a creative might be selected from an integrated third-party content management system (CMS). Depending on the integration, the thumbnail image for this asset might not be displayed in the creative or in the task that uses the creative. The asset is displayed on the device or location where it is delivered.

To view the asset, open the creative and click **Edit**.

Data Collection

The following issues are related to settings for data collection, basic configurations, and advanced configurations.

Web Page Does Not Load When Selecting an Element for Configuration

When you click to select a page element, the web page does not load. As a result, you cannot complete the configuration rule.

Solution: Verify that the following are true:

- There are no typographical errors in the web page address.
- The web page is free of configurations that prevent it from loading in a frame. For example, a web page might use the `X-Frame-Options` HTTP header to limit its ability to be loaded into a frame. In this case, you can allow a specific domain to load your page by also using the `ALLOW-FROM` value in your HTTP header.

Cannot Select Element or Web Spots on a Page

When using the element selector to define a configuration rule, the web page is displayed, but you cannot select an element to use.

Solution: Verify that the following are true:

- The web page being loaded into the frame contains the SAS Customer Intelligence 360 tag. This tag is required in order for the system to interact with your web page. If this tag is missing, the web page is displayed but you cannot define an event or spot.
- The web page being loaded into the frame uses HTTPS. SAS Customer Intelligence 360 is a secure site (HTTPS) and works properly only if the page that it loads is also secure. If your web page loads via HTTP, the page is displayed but you cannot define an event or spot. To resolve this issue, either use HTTPS to load your page or allow your browser to load mixed content. To allow mixed content to load in Firefox or Chrome, click the alert shield icon. To allow mixed content to load in Microsoft Internet Explorer, click the warning that is displayed.
- The browser accepts third-party cookies. If your browser blocks third-party cookies, SAS Customer Intelligence 360 cannot serve all the necessary

elements for Events or Spots. For more information, see “Managing Cookies” on page 302.

Regular Expressions Do Not Match Expected Patterns

If your regular expression is matching patterns that are expecting uppercase characters, then the pattern cannot be found. In SAS Customer Intelligence 360, all of the input values (such as a website’s URL or a page element’s attribute value) are converted to lowercase before comparisons are made.

Create regular expressions that are not case sensitive, or create expressions that match lowercase characters only. For example, use the regular expression `.*prod[Bb][Kk]+.*` instead of the case-sensitive expression `.*prod[B][K]+.*`.

Data Hub

Concurrent Updates Might Cause Issues with Duplicate Identities

If you upload data with more than one record that shares the same ID, the order of the resulting identity map might not be as you expect. Identity mappings are created in a parallel process, so IDs can cause mapping conflicts if they are used for more than one record.

Solution: There is currently no workaround. To mitigate possible occurrences, ensure that IDs that you control are unique to each visitor. If this issue does occur, all records are still mapped to data hub IDs, but the order of the mapping depends on the order in which the records are processed.

Events, Data Views, and Spots

The following problems are related to events and spots.

Web Page Does Not Load When Creating Events or Spots

Problem: When creating a new click event, form submit event, page view event, or web spot, the web page does not load. As a result, I cannot complete event or spot creation.

Solution: Verify that the following are true:

- There are no typographical errors in the web page address.
- The web page is free of configurations that prevent it from loading in a frame. For example, a web page might use the **`X-Frame-Options`** HTTP header to limit its ability to be loaded into a frame. In this case, you can allow a specific domain to load your page by also using the **`ALLOW-FROM`** value in your HTTP header.

Cannot Define Web Events or Web Spots on a Page

Problem: When creating a new click event, form submit event, page view event, or web spot, the web page is displayed but I cannot select an area to define an event or spot.

Solution: Verify that the following are true:

- The web page being loaded into the frame contains the SAS Customer Intelligence 360 tag. This tag is required in order for the system to interact with your web page. If this tag is missing, the web page is displayed but you cannot define an event or spot.
- The web page being loaded into the frame uses HTTPS. SAS Customer Intelligence 360 is a secure site (HTTPS) and works properly only if the page that it loads is also secure. If your web page loads via HTTP, the page is displayed but you cannot define an event or spot. To resolve this issue, either use HTTPS to load your page or allow your browser to load mixed content. To allow mixed content to load in Firefox or Chrome, click the alert shield icon. To allow mixed content to load in Microsoft Internet Explorer, click the warning that is displayed.
- The browser accepts third-party cookies. If your browser blocks third-party cookies, SAS Customer Intelligence 360 cannot serve all the necessary elements for Events or Spots. For more information, see "Managing Cookies" on page 302.

My Spot Is Empty

Problem: My spot is not displaying any content.

Solution: Review these guidelines and take action if necessary:

- Requests for content stored on external servers time out after 500 ms (0.5 sec). If SAS Customer Intelligence 360 cannot access the content for a spot within that time, the result can be an empty spot. Ensure that the content delivery can be completed within this time-out period.
- Make sure the domain where the content is hosted is an approved domain. For more information, see “Domains” on page 20.

Spot Contains Unexpected Content

Problem: My spot or spot set does not display the content being delivered by my task.

Solution: When multiple tasks with the same priority deliver content to the same spot, the spot might not display the content that you expect. Try changing the priority of one of the tasks.

Note: This issue can also occur when two tasks have the same priority and the same spot is used as a standard spot in one task and as part of a spot set in a second task.

Spots Flicker While Content is Loading

Problem: Spots seem to flicker on my web page before they are filled with content.

Solution: Consider using a class attribute to hide spot elements until content is loaded. By default, the class attribute is "sas-ci360-hidden", but you can use a custom class by changing the hiddenClass variable in the SAS tag. For more information, see “Insert the JavaScript” on page 16.

Spots and Events Are Not Working on My Site

Problem: When I look at my site, I cannot see content being delivered to any spots. In addition, events are not activated.

Solution: When a spot or event is open in SAS Customer Intelligence 360, content delivery and event processing are suspended for the site on other tabs that are open on the same browser instance. To see content delivered or to process events on the site, close all spots and events for that site in SAS Customer Intelligence 360.

Data View Attribution Is Not Working

Problem: The **Attribution** tab of my data view does not contain any information.

Solution: Ensure the following items:

- Enough time has passed to gather the minimum data required for analysis to begin.

Note: You can navigate to the **Attribution** tab to see whether enough time has passed for data analysis.

- Ensure that your data view name does not contain a comma.

  Note: Commas are used as delimiters during analysis of the data. Including a comma in your data view name can prevent successful analysis.

Activities and Tasks

These problems are related to activities and tasks.

Delivery of Creatives Is Delayed for a Large Number of Published Tasks

The number of active tasks can affect the time it takes to reload all the task definitions. When there are a large number of active tasks, the delivery of all creatives might be delayed for several minutes after the task is published. This delay is usually imperceptible to customers because they do not know which tasks and creatives they are supposed to receive. Marketers should end or delete any unnecessary tasks in order to reduce the length of time needed to refresh the tasks in the running system.

My Activity Ended Unexpectedly

Problem: This issue might be caused by ending a spot in a task that is used by an activity. The result is that the task and the activity are completed.

Solution: Verify that none of the tasks in the activity contain a completed spot.

1. Open each task in the activity.
2. On the **Content** tab of the task, note the name of the spot.
3. Navigate to **Spots**. Verify the status of that spot.
4. If the spot is complete, create a new spot for the task to use and update the task.
5. Create a new activity that uses the task in the completed activity.

My Task Ended Unexpectedly

Problem: This issue might be caused by ending a spot that is used by the task. The result is that the task is completed.

Solution: Verify that the task does not contain a completed spot.

1 Open the task and navigate to the **Content** tab.

2 On the **Content** tab of the task, note the name of the spot.

3 Navigate to **Spots**. Verify the status of that spot.

4 If the spot is complete, create a new spot for the task to use and update the task.

I Cannot Change the Start Date of My Task

The start date that you set for a task cannot be modified after the task has a status of Scheduled or Active. However, you can change the start date and save it as a new task.

TIP You can change the start date of a task while the task is publishing. When you click **Publish** but before the status becomes Scheduled or Active, the task has a status of Publishing.

Only Part of My Creative Is Displaying

Navigate to the message that contains the creative. Verify that the character count of the creative's HTML does not exceed 2,048 characters.

Publishing a Task Fails When the Task Uses Targeted Data

Problem: A task does not publish successfully when it is associated with targeted data. Log files contain an error message similar to this:

```
Task failed to publish. And error in engine log:
com.sas.mkt.decision.engine.ia.tags.ManageTags - NOTE: found no tags.
```

Solution: When you create a data item that is used for targeting, create the data descriptor using these values:

- Set makeAvailableForTargeting to **`true`**.
- Set the name attribute to **`primary_offer`** or **`secondary_offers`**.
- Set the type attribute to **`String`**.

The Total Visitors Count for My Task Is Decreasing

Problem: The **Total Visitors Count** on the **Insights** tab of my task has decreased in the past few hours.

Solution: The counts are adjusted over time based on user identity processing. For example, a user might click a creative twice but be signed in during only one of the times that the creative was clicked. SAS Customer Intelligence 360 uses identity processing to ensure that those two actions are attributed only to one user. For more information, see “User Identities” on page 87.

Consecutively Republished Emails Display Only the Most Recent Content

You modified the task content a few times and republished it consecutively, but all emails that are received by the recipients display content only from the most recent update.

This is because if you modify the content and republish a task consecutively before the previous email is delivered, the system does not create a new copy of the original task. Instead, the system overwrites the single, published copy of the task and delivers the latest version of the content. For example, if you republish a task (which contains content blocks) three times, your recipients will receive three emails, all of which display only the latest updated version of the task content.

Unsubscribe Option is Enabled Through Email Replies But Not Honored

Verify that the reply domain that is configured in the send agent is correctly registered in the system.

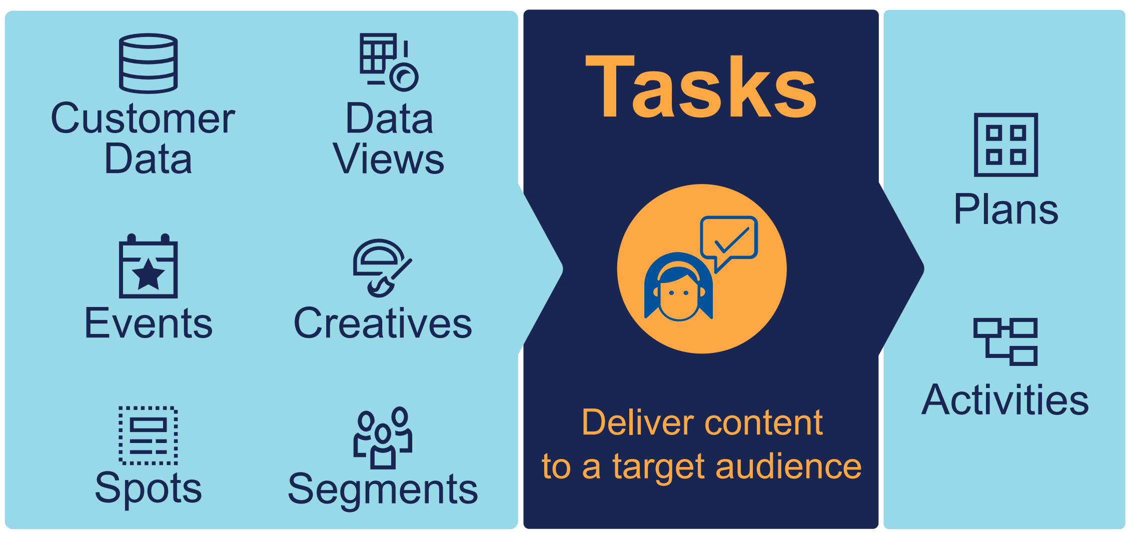
Links to Some URLs in my Email Content are Not Tracked or Redirected Properly

Links that you insert in an outbound message are tracked for the purpose of collecting behavioral data. The system automatically replaces all Href's of the links in the message with a unique URL that points to a domain that is hosted by SAS on the tracking server. The unique code in the tracked link is used to look up the original URL so that an HTTP request can be issued to redirect the link. The redirect request requires the original URL to be passed back in the location response header of the HTTP request. Some browsers do not correctly support headers that contain non-ASCII characters. If the redirection to the original link is for a URL that contains double-byte (non-ASCII) characters, then the browser might display an error. It is recommended that you do not insert links to URLs that contain non-ASCII characters.

Appendix 2

Reference

Types of Tasks



Tasks deliver content to a target audience and collect information that you can use to monitor how the content is performing. When you create a task, you can use a combination of customer data, data views, events, creatives, spots, and segments.

Tasks can be used in activities and can be associated with plans. When creating a task from a planning item, you are required to enter only a task name before saving the task. Tasks created without all the required information are assigned a Planning status and can be updated later with the required information. In this manner, a marketer can create a placeholder task that is updated later by a person familiar with the task requirements.

Direct Marketing

Use a direct marketing task to deliver print marketing material such as catalogs. For more information, see “About Direct Marketing Tasks” on page 523.

Email

Use email tasks to deliver content to your recipient’s inbox by creating tasks that send mass emails. Email tasks also track and collect data about how your recipients interact with the content in the email. For more information, see “ About Email Tasks” on page 560.

External System

Use an external system task to send a creative to an agent when criteria for the task are met.For more information, see "About External System Tasks" on page 541.

Mobile

Use mobile tasks to collect data across your mobile applications by using the analytics, marketing process orchestration, and reporting information provided based on customer or prospect behavior.

- In-app message tasks publish a context-sensitive message within a mobile application while the user is in the application.
- Mobile spot tasks display a message on a specific spot within a mobile application.
- Mobile spot A/B test tasks compare the effectiveness of multiple messages on a spot within a mobile application.
- Push notification tasks display a message on a mobile device.

For more information, see "About Mobile Tasks" on page 644.

Web

Use web tasks to track how people interact with your website by creating tasks that deliver content to one or more spots on your web pages.

- A standard task enables you to specify what content is delivered.
- A recommendation task uses analytics to deliver personalized content to users.
- A staged creative task delivers content that is staged by an external system.

For more information, see "About Web Tasks" on page 708.

Web Test Tasks

You can create an A/B or Multivariate web task to test how content performs on your website. For more information, see "Deciding Which Type of Test to Run" on page 930.

Supported Operators

About Supported Operators

SAS Customer Intelligence 360 supports string operators, numeric operators, CSS selectors on page 989, and regular expressions in parts of the user interface.

Take note of the following guidelines when you use these operators:

- Separate multiple values with semicolons (;). The semicolon is equivalent to `or`.
- The operators are case insensitive. For example, if you enter `Starts with: operator` or `starts with: operator`, the text `Starts with: operator` is displayed.

String Operators

You can use the string data type in spot attributes, event attributes, segments, customer data, and imported lists.

Table A2.1 String Operators

Operator	Description	Examples
Typed values	Matches the listed values.	`marketing` `marketing; creatives; coupon`
`Starts with`	Matches anything that starts with the values listed after the colon. If you enter `Begins with`, the text is displayed as `Starts with`.	`Starts with: marketing` `Starts with: marketing; creatives; coupon`
`Ends with`	Matches anything that ends with the values listed after the colon.	`Ends with: marketing` `Ends with: marketing; creatives; coupon`
`Contains`	Matches anything that contains the values listed after the colon.	`Contains: marketing` `Contains: marketing; creatives; coupon`
`Excludes`	Excludes the items after the vertical bar (|).	`Excludes|marketing` `Excludes|marketing; creatives; coupon`

Numeric Operators

Table A2.2 Numeric Operators

Operator	Description	Example
`to` `-`	Expresses a range. The hyphen (-) is displayed as `to`.	`1 to 5` `1 to 5; 20 to 40`
`>`	Greater than.	`>34` `>3 to 7`
`<`	Less than.	`<-6` `5 to <10`

<table>
<tr><th>Operator</th><th>Description</th><th>Example</th></tr>
<tr><td>Exclude</td><td>Excludes the listed values.</td><td>Exclude|1; 2; 3; 4
Exclude|1 to 5</td></tr>
</table>

CSS Selectors

Overview

CSS selectors are used to select one or more page elements based on their place in the document structure or attributes that might be present. Typically, these selectors are used in .css files to apply HTML styles, but they can be useful in any case that requires a granular level of control over element selection.

The basic structure of a CSS selector is this: **`element_level1 > element_level2 > element_level3`**, where each element is at a different level of the document hierarchy.

Here are some basic guidelines and operators for CSS selectors:

- CSS selectors can be absolute (where they specify the entire document tree to your desired element) or relative (where they specify only the surrounding elements).
  - **`html > body > div > p`** is an absolute selector, so the <p> element is selected only if it is in this exact position.
  - **`div > p`** is a relative selector, so it selects any <p> element that is inside a <div> element.
- The **`.`** operator selects an element based on its class attribute. For example, the selector **`div > p.normalFont`** selects only <p> elements that are inside a <div> element and have a class attribute equal to **`normalFont`**.
- The **`#`** operator selects an element based on its ID attribute. For example, the selector **`div > p#firstOne`** selects only <p> elements that are inside a <div> element and have an ID equal to **`firstOne`**.
- The **`[]`** operators specify additional conditions that must be met (similar to an AND condition or a set intersection). For example:
  - The selector **`p > a[target]`** selects only <a> elements that have a target attribute and are children of a <p> element.
  - The selector **`p > a[target=_blank]`** selects the same <a> element as the previous example, but the target attribute must be equal to **`_blank`**.

For more operators and examples, see CSS Selector Reference (external link).

Using CSS Selectors in SAS Customer Intelligence 360

You can use CSS selectors in SAS Customer Intelligence 360 for a variety of features, such as selecting elements for event triggers or selecting spots for a web or mobile spot task. When you select an element in the page browser for an event or spot, the system generates a CSS selector that is specific to that element.

In many cases you need to use a more general selector. To do so, you can manually edit the generated selector to customize the elements that you want to use. When you manually edit the selector in the browser, the page highlights all elements that match your new selector path.

Here are some best practices to follow when you create or modify CSS selectors:

- Make the selectors as general or relative as possible. Page elements and document structures can change dynamically (especially when you use responsive design), so CSS selectors should not be explicit about too many levels of the document hierarchy or attributes.

  For example, to create a selector for any Add to Cart button on your web page, select an existing Add to Cart button and then modify the CSS selector by removing the product-specific information. After you remove product-specific information, your selector now highlights all of the Add to Cart buttons on the page.
- Match elements based on ID attributes or name attributes when they exist. If you can control how elements on your site are defined, assign IDs and name attributes to elements when possible.
- When you match an element based on its class attribute, select a class attribute that is not going to be changed dynamically.
- When you select an element for spot placement, make sure that you select the element (such as a <div>) that is the parent of the actual spot's content. If you use the page browser and select an existing spot, you might inadvertently select an element in the spot itself, rather than the container element that should be matched.

Regular Expressions

Regular expressions (abbreviated as regex or regexp) are sequences of characters that are used to match patterns in text. Regular expressions are typically used to find complex patterns that a basic search cannot find. For more background information, see Regular expression on Wikipedia.

This table contains some examples of regular expressions:

Table A2.3 Examples of Regular Expressions

<table>
<tr><th>Description</th><th>Example</th></tr>
<tr><td>Match a domain or host name that has valid characters only and top-level domains that are specified in the expression.</td><td><code>^[a-zA-Z0-9\-\.]+\.(com|org|net|mil|edu|COM|ORG|NET|MIL|EDU)$</code></td></tr>
<tr><td>Match any internet URL.</td><td><code>((mailto\:|(news|(ht|f)tp(s?))\://){1}\S+)</code></td></tr>
<tr><td>Match double-digit numbers that range from 10 to 99.</td><td><code>[1-9][0-9]</code></td></tr>
</table>

Follow these guidelines when using regular expressions:

- Regular expressions should match case-insensitive patterns. SAS Customer Intelligence 360 converts all input values (such as a website's URL or a page element's attribute value) to lowercase before making comparisons.

  Create regular expressions that are not case sensitive, or create expressions that match lowercase characters only. For example, use the regular expression `.*prod[Bb][Kk]+.*` instead of the case-sensitive expression `.*prod[B][K]+.*`.

- If a URL uses special characters, use the HTML encoding of the special character when you create the regular expression.

- If the regular expression contains special characters, use a backslash (\) in front of the special character as an escape character. For example, if you need to match the regular expression `\a\d{2}.*` (where "\" is the special character), the escaped version is `\\a\\d{2}.*` (where the first "\" is the escape character, and the second "\" is the special character).

Programming Interfaces

- Managing customer data through the REST API:
  - "Importing Data through the REST API"
  - Chapter 21, "Exporting Data,"
  - "Deleting Customer Identity Data"
- "Using the JavaScript Events API". This interface is a Javascript API that can be integrated into your site's scripting to control how some events are sent.
- Integrating with other systems through the external API gateway:
  - Chapter 61, "Setting Up the External API Gateway,"
  - Chapter 62, "Streaming Events,"
  - Chapter 63, "Integrating with Content Management Systems,"
  - "Downloading Data from SAS Customer Intelligence 360"
- Using the Mobile SDK
- Plan for SAS Customer Intelligence 360 (external). This reference information includes the generated reference and concepts for a REST API that enables you to manage items for SAS 360 Plan.

Reserved Words

About the Tables of Reserved Words

The following tables are lists of words that are reserved and cannot be used by items in SAS Customer Intelligence 360. Each table contains two additional columns:

- **Reserved in Spots:** If the value in this column is `Yes`, the word cannot be used in any items that are related to spots.
- **Reserved in Non-Spots:** If the value in this column is `Yes`, the word cannot be used in items that are not spots.

Words that have `Yes` in both columns are reserved globally and cannot be used anywhere in the solution.

A

Table A2.4 Reserved Words That Start with "A"

Word	Reserved in Spots	Reserved in Non-Spots
accessible	Yes	No
acted	Yes	No
action	Yes	No
add	Yes	No
advertiser	Yes	No
advertisers	Yes	No
agencies	Yes	No
agency	Yes	No
all	Yes	No
alter	Yes	No
analyze	Yes	No

Word	Reserved in Spots	Reserved in Non-Spots
anchor_href	No	Yes
anchor_id	No	Yes
anchor_name	No	Yes
and	Yes	Yes
archive	Yes	No
area	Yes	No
areas	Yes	No
array	Yes	Yes
as	Yes	No
asc	Yes	No
asensitive	Yes	No

B

Table A2.5 Reserved Words That Start with "B"

Word	Reserved in Spots	Reserved in Non-Spots
begin	Yes	Yes
boolean	Yes	Yes
before	Yes	No
between	Yes	No
bigint	Yes	No
binary	Yes	No
blob	Yes	No
both	Yes	No

Word	Reserved in Spots	Reserved in Non-Spots
by	Yes	No

C

Table A2.6 Reserved Words That Start with "C"

Word	Reserved in Spots	Reserved in Non-Spots
call	Yes	Yes
campaign	Yes	No
campaigns	Yes	No
cascade	Yes	No
case	Yes	No
change	Yes	No
char	Yes	No
character	Yes	No
charset	Yes	No
check	Yes	No
city	Yes	No
clicked	Yes	No
collate	Yes	No
column	Yes	No
columns	Yes	No
comment	Yes	No
condition	Yes	No
constraint	Yes	No

Word	Reserved in Spots	Reserved in Non-Spots
constraints	Yes	No
continue	Yes	No
convert	Yes	No
cookie.*	No	Yes
country	Yes	No
create	Yes	No
creative	Yes	No
creatives	Yes	No
cross	Yes	No
csn	No	Yes
cts	No	Yes
cts_base	No	Yes
cts_boot_base	No	Yes
current	Yes	No
current_date	Yes	No
current_time	Yes	No
current_timestamp	Yes	No
current_user	Yes	No
cursor	Yes	No
cursor_name	Yes	No

D

Table A2.7 Reserved Words That Start with "D"

Word	Reserved in Spots	Reserved in Non-Spots
dailygoal	Yes	No
data	Yes	No
database	Yes	No
databases	Yes	No
datafile	Yes	No
date	Yes	Yes
datetime	Yes	No
day	Yes	No
day_hour	Yes	No
day_microsecond	Yes	No
day_minute	Yes	No
day_second	Yes	No
dec	Yes	No
decimal	Yes	No
declare	Yes	No
default	Yes	No
default_auth	Yes	No
deferrable	Yes	No
deferred	Yes	No
definer	Yes	No
delay_key_write	Yes	No
delayed	Yes	No

Word	Reserved in Spots	Reserved in Non-Spots
delete	Yes	No
des_key_file	Yes	No
desc	Yes	No
describe	Yes	No
deterministic	Yes	No
diagnostics	Yes	No
directory	Yes	No
disable	Yes	No
discard	Yes	No
discount	Yes	No
disk	Yes	No
distinct	Yes	No
distinctrow	Yes	No
div	Yes	No
domain	No	Yes
double	Yes	No
drop	Yes	No
dual	Yes	No
dumpfile	Yes	No
duplicate	Yes	No
dynamic	Yes	No

E

Table A2.8 Reserved Words That Start with "E"

Word	Reserved in Spots	Reserved in Non-Spots
each	Yes	No
elementTagName	No	Yes
else	Yes	Yes
elseif	Yes	No
enable	Yes	No
enclosed	Yes	No
end	Yes	Yes
ends	Yes	No
engine	Yes	No
engines	Yes	No
enum	Yes	No
error	Yes	No
errors	Yes	No
escape	Yes	No
escaped	Yes	No
event	Yes	Yes
eventSource	No	Yes
event_id	No	Yes
eventname	No	Yes
events	Yes	No
every	Yes	No
exchange	Yes	No

Word	Reserved in Spots	Reserved in Non-Spots
exists	Yes	No
exit	Yes	No
expansion	Yes	No
explain	Yes	No
extended	Yes	No
extent_size	Yes	No

F

Table A2.9 Reserved Words That Start with “F”

Word	Reserved in Spots	Reserved in Non-Spots
false	Yes	Yes
fast	Yes	No
faults	Yes	No
fdate	Yes	No
fetch	Yes	No
file	Yes	No
first	Yes	No
fixed	Yes	No
flags	No	Yes
flight	Yes	No
flights	Yes	No
float4	Yes	No
float8	Yes	No

Word	Reserved in Spots	Reserved in Non-Spots
float	Yes	No
for	Yes	No
force	Yes	No
foreign	Yes	No
form.f.*	No	Yes
found	Yes	No
from	Yes	No
full	Yes	No
fulltext	Yes	No
function	Yes	No

G

Table A2.10 Reserved Words That Start with "G"

Word	Reserved in Spots	Reserved in Non-Spots
general	Yes	No
geometry	Yes	No
geometrycollection	Yes	No
get	Yes	No
get_format	Yes	No
global	Yes	No
goto	Yes	Yes
grant	Yes	No
grants	Yes	No

Word	Reserved in Spots	Reserved in Non-Spots
group	Yes	No

H

Table A2.11 Reserved Words That Start with "H"

Word	Reserved in Spots	Reserved in Non-Spots
hash	Yes	No
having	Yes	No
hb	No	Yes
hidden	Yes	Yes
high_priority	Yes	No
hosts	Yes	No
hour	Yes	No
hour_microsecond	Yes	No
hour_minute	Yes	No
hour_second	Yes	No
hourlygoal	Yes	No
hours	Yes	No

I

Table A2.12 Reserved Words That Start with "I"

Word	Reserved in Spots	Reserved in Non-Spots
identified	Yes	No
if	Yes	Yes
ignore	Yes	No
ignore_server_ids	Yes	No
import	Yes	No
impressions	Yes	No
in	Yes	No
index	Yes	No
indexes	Yes	No
industries	Yes	No
infile	Yes	No
initial_size	Yes	No
inner	Yes	No
inout	Yes	No
insensitive	Yes	No
insert	Yes	No
insert_method	Yes	No
int1	Yes	No
int2	Yes	No
int3	Yes	No
int4	Yes	No
int8	Yes	No

Word	Reserved in Spots	Reserved in Non-Spots
int	Yes	No
integer	Yes	Yes
interval	Yes	No
into	Yes	No
invoker	Yes	No
io	Yes	No
io_thread	Yes	No
ipc	Yes	No
is	Yes	No
isolation	Yes	No
issuer	Yes	No
iterate	Yes	No

J

Table A2.13 Reserved Words That Start with "J"

Word	Reserved in Spots	Reserved in Non-Spots
join	Yes	No

K

Table A2.14 Reserved Words That Start with "K"

Word	Reserved in Spots	Reserved in Non-Spots
key	Yes	No
key_block_size	Yes	No
keys	Yes	No
kill	Yes	No

L

Table A2.15 Reserved Words That Start with "L"

Word	Reserved in Spots	Reserved in Non-Spots
last	Yes	No
leading	Yes	No
leave	Yes	No
leaves	Yes	No
left	Yes	No
less	Yes	No
level	Yes	No
like	Yes	No
limit	Yes	No
linear	Yes	No
lines	Yes	No
linestring	Yes	No

Word	Reserved in Spots	Reserved in Non-Spots
list	Yes	No
load	Yes	No
load_id	No	Yes
local	Yes	No
localtime	Yes	No
localtimestamp	Yes	No
location	No	Yes
lock	Yes	No
locks	Yes	No
logfile	Yes	No
logs	Yes	No
long	Yes	No
longblob	Yes	No
longtext	Yes	No
loop	Yes	No
low_priority	Yes	No

M

Table A2.16 Reserved Words That Start with "M"

Word	Reserved in Spots	Reserved in Non-Spots
master	Yes	No
master_bind	Yes	No
master_connect_retry	Yes	No

Word	Reserved in Spots	Reserved in Non-Spots
master_delay	Yes	No
master_heartbeat_period	Yes	No
master_host	Yes	No
master_log_file	Yes	No
master_log_pos	Yes	No
master_password	Yes	No
master_port	Yes	No
master_retry_count	Yes	No
master_server_id	Yes	No
master_ssl	Yes	No
master_ssl_ca	Yes	No
master_ssl_capath	Yes	No
master_ssl_cert	Yes	No
master_ssl_cipher	Yes	No
master_ssl_crl	Yes	No
master_ssl_crlpath	Yes	No
master_ssl_key	Yes	No
master_ssl_verify_server_cert	Yes	No
master_user	Yes	No
match	Yes	No
max_connections_per_hour	Yes	No
max_queries_per_hour	Yes	No
max_rows	Yes	No
max_size	Yes	No
max_updates_per_hour	Yes	No
max_user_connections	Yes	No

Word	Reserved in Spots	Reserved in Non-Spots
maxvalue	Yes	No
medium	Yes	No
mediumblob	Yes	No
mediumint	Yes	No
mediumtext	Yes	No
memory	Yes	No
merge	Yes	No
message_text	Yes	No
meta.*	No	Yes
microsecond	Yes	No
middleint	Yes	No
migrate	Yes	No
min_rows	Yes	No
minute	Yes	No
minute_microsecond	Yes	No
minute_second	Yes	No
mod	Yes	No
mode	Yes	No
modifies	Yes	No
modify	Yes	No
month	Yes	No
multilinestring	Yes	No
multipoint	Yes	No
multipolygon	Yes	No
mutex	Yes	No
mysql_errno	Yes	No

N

Table A2.17 Reserved Words That Start with “N”

Word	Reserved in Spots	Reserved in Non-Spots
name	Yes	No
names	Yes	No
national	Yes	No
natural	Yes	No
nchar	Yes	No
ndb	Yes	No
ndbcluster	Yes	No
new	Yes	No
next	Yes	No
no_wait	Yes	No
no_write_to_binlog	Yes	No
nodegroup	Yes	No
none	Yes	No
not	Yes	Yes
null	Yes	Yes
number	Yes	No
numeric	Yes	No
nvarchar	Yes	No

O

Table A2.18 Reserved Words That Start with "O"

Word	Reserved in Spots	Reserved in Non-Spots
offset	Yes	No
old_password	Yes	No
on	Yes	No
onclick	No	Yes
one	Yes	No
one_shot	Yes	No
optimize	Yes	No
option	Yes	No
optionally	Yes	No
or	Yes	Yes
order	Yes	No
out	Yes	No
outer	Yes	No
outfile	Yes	No

P

Table A2.19 Reserved Words That Start with "P"

Word	Reserved in Spots	Reserved in Non-Spots
pack_keys	Yes	No
page	Yes	No

Word	Reserved in Spots	Reserved in Non-Spots
page_title	No	Yes
partial	Yes	No
partition	Yes	No
partitioning	Yes	No
partitions	Yes	No
password	Yes	No
phase	Yes	No
plugin	Yes	No
plugin_dir	Yes	No
plugins	Yes	No
point	Yes	No
pointer	Yes	Yes
polygon	Yes	No
port	No	Yes
precision	Yes	No
preemptible	Yes	No
preserve	Yes	No
prev	Yes	No
primary	Yes	No
private	Yes	Yes
privileges	Yes	No
probability	Yes	No
procedure	Yes	No
processlist	Yes	No
product	Yes	No
products	Yes	No

Word	Reserved in Spots	Reserved in Non-Spots
profile	Yes	No
profiles	Yes	No
proposal	Yes	No
proposals	Yes	No
protocol	No	Yes
proxy	Yes	No
public	Yes	Yes
purge	Yes	No

Q

Table A2.20 Reserved Words That Start with “Q”

Word	Reserved in Spots	Reserved in Non-Spots
quarter	Yes	No
query	Yes	No
quick	Yes	No

R

Table A2.21 Reserved Words That Start with “R”

Word	Reserved in Spots	Reserved in Non-Spots
range	Yes	No
read	Yes	No

Word	Reserved in Spots	Reserved in Non-Spots
read_only	Yes	No
read_write	Yes	No
reads	Yes	No
real	Yes	Yes
rebuild	Yes	No
recover	Yes	No
redo_buffer_size	Yes	No
redofile	Yes	No
redundant	Yes	No
references	Yes	No
referrer	No	Yes
regexp	Yes	No
region	Yes	No
regions	Yes	No
relay	Yes	No
relay_log_file	Yes	No
relay_log_pos	Yes	No
relay_thread	Yes	No
relaylog	Yes	No
release	Yes	No
reload	Yes	No
rename	Yes	No
reorganize	Yes	No
repeat	Yes	No
repeatable	Yes	No
replace	Yes	No

Word	Reserved in Spots	Reserved in Non-Spots
replication	Yes	No
requestedfile	No	Yes
require	Yes	No
resignal	Yes	No
restrict	Yes	No
resume	Yes	No
return	Yes	Yes
returned_sqlstate	Yes	No
returns	Yes	No
reverse	Yes	No
revoke	Yes	No
rfp	Yes	No
rfps	Yes	No
right	Yes	No
rlike	Yes	No
rollup	Yes	No
routine	Yes	No
row	Yes	No
row_count	Yes	No
row_format	Yes	No
rows	Yes	No
rtree	Yes	No

S

Table A2.22 Reserved Words That Start with "S"

Word	Reserved in Spots	Reserved in Non-Spots
salesperson	Yes	No
schedule	Yes	No
schema	Yes	No
schema_name	Yes	No
schemas	Yes	No
second	Yes	No
second_microsecond	Yes	No
select	Yes	No
sensitive	Yes	No
separator	Yes	No
serial	Yes	No
serializable	Yes	No
session	Yes	Yes
set	Yes	No
share	Yes	No
show	Yes	No
shutdown	Yes	No
signal	Yes	No
simple	Yes	No
site	Yes	No
sites	Yes	No
size	Yes	No

Word	Reserved in Spots	Reserved in Non-Spots
slow	Yes	No
smallint	Yes	No
snapshot	Yes	No
sounds	Yes	No
source	Yes	No
spatial	Yes	No
specific	Yes	No
sql	Yes	No
sql_big_result	Yes	No
sql_buffer_result	Yes	No
sql_cache	Yes	No
sql_calc_found_rows	Yes	No
sql_no_cache	Yes	No
sql_small_result	Yes	No
sql_thread	Yes	No
sql_tsi_day	Yes	No
sql_tsi_hour	Yes	No
sql_tsi_minute	Yes	No
sql_tsi_month	Yes	No
sql_tsi_quarter	Yes	No
sql_tsi_second	Yes	No
sql_tsi_week	Yes	No
sql_tsi_year	Yes	No
sqlexception	Yes	No
sqlstate	Yes	No
sqlwarning	Yes	No

Word	Reserved in Spots	Reserved in Non-Spots
ssl	Yes	No
starting	Yes	No
starts	Yes	No
static	Yes	Yes
status	Yes	No
step	Yes	Yes
storage	Yes	No
straight_join	Yes	No
string	Yes	Yes
subclass_origin	Yes	No
subject	Yes	No
subpartition	Yes	No
subpartitions	Yes	No
super	Yes	No
suspend	Yes	No
swaps	Yes	No
switches	Yes	No
system_type	No	Yes

T

Table A2.23 Reserved Words That Start with "T"

Word	Reserved in Spots	Reserved in Non-Spots
table	Yes	No

Word	Reserved in Spots	Reserved in Non-Spots
table_checksum	Yes	No
table_name	Yes	No
tables	Yes	No
tablespace	Yes	No
targetInnerText	No	Yes
targetSelectorPath	No	Yes
temporary	Yes	No
temptable	Yes	No
terminated	Yes	No
text	Yes	No
than	Yes	No
the	Yes	No
then	Yes	Yes
tier	Yes	No
tiers	Yes	No
time	Yes	No
timestamp	Yes	Yes
timestampadd	Yes	No
timestampdiff	Yes	No
tinyblob	Yes	No
tinyint	Yes	No
tinytext	Yes	No
title	No	Yes
to	Yes	Yes
trafficker	Yes	No
trailing	Yes	No

Word	Reserved in Spots	Reserved in Non-Spots
transaction	Yes	No
trigger	Yes	No
triggers	Yes	No
true	Yes	Yes
truncate	Yes	No
type	Yes	No
types	Yes	No

U

Table A2.24 Reserved Words That Start with "U"

Word	Reserved in Spots	Reserved in Non-Spots
uncommitted	Yes	No
undefined	Yes	No
undo	Yes	No
undo_buffer_size	Yes	No
undofile	Yes	No
union	Yes	No
unique	Yes	No
unknown	Yes	No
unlock	Yes	No
unsigned	Yes	No
until	Yes	No
update	Yes	No

Word	Reserved in Spots	Reserved in Non-Spots
uri	No	Yes
usage	Yes	No
use	Yes	No
use_frm	Yes	No
user	Yes	No
user_resources	Yes	No
users	Yes	No
using	Yes	No
utc_date	Yes	No
utc_time	Yes	No
utc_timestamp	Yes	No

V

Table A2.25 Reserved Words That Start with "V"

Word	Reserved in Spots	Reserved in Non-Spots
value	Yes	No
values	Yes	No
varbinary	Yes	No
varchar	Yes	No
varcharacter	Yes	No
variables	Yes	No
varying	Yes	No
version	No	Yes

Word	Reserved in Spots	Reserved in Non-Spots
view	Yes	No
visible	Yes	Yes
visitor	No	Yes

W

Table A2.26 Reserved Words That Start with "W"

Word	Reserved in Spots	Reserved in Non-Spots
wait	Yes	No
warnings	Yes	No
week	Yes	No
weight_string	Yes	No
when	Yes	No
where	Yes	No
while	Yes	Yes
with	Yes	No
work	Yes	No
write	Yes	No

X

Table A2.27 Reserved Words That Start with "X"

Word	Reserved in Spots	Reserved in Non-Spots
x509	Yes	No
xml	Yes	No
xor	Yes	No

Y

Table A2.28 Reserved Words That Start with "Y"

Word	Reserved in Spots	Reserved in Non-Spots
year	Yes	No
year_month	Yes	No

Z

Table A2.29 Reserved Words That Start with "Z"

Word	Reserved in Spots	Reserved in Non-Spots
zerofill	Yes	No

Detail Mart Tables and Columns

SAS Customer Intelligence 360 Streaming Data Platform

Introduction to the SAS Customer Intelligence 360 Streaming Data Platform

SAS is introducing the SAS Customer Intelligence 360 Streaming Data Platform, which enables users to have faster access to rich, contextualized data. In the past, users had to wait for a batch process to finish before normalization rules were applied based on definitions in the Basic Collection Rules and Advanced Collection Rules. This delay meant that users might have to wait for two hours or more before downloading the data through the SAS Customer Intelligence 360 Download API on page 870.

The new streaming data platform applies your business rules in real time, which enables you to receive contextualized events through the on-premises agent and SDK. The streaming data also reduces the time for downloading data through the SAS Customer Intelligence 360 Download API to approximately 10 minutes.

The switch from batch processing to the SAS Customer Intelligence 360 Streaming Data Platform includes some changes to the structure of the detail tables provided, as described in this section. In most cases, no immediate action is required. Existing download processes will continue to work, but some downstream queries might need to be adjusted in order to gain access to certain information.

New Characteristics of Data Dictionary

The following subsections detail all of the changes to the detail data model. The data dictionary is included later in this section.

Retired Data Items

Retired data items are remaining in the data model to ensure integrity in the order of the downloaded CSV files. These columns still exist, but they are no longer populated.

Table A2.30 *Retired Data Items*

Table	Columns	Comment

SESSION_DETAILS	CLIENT_SESSION_START_DTTM CLIENT_SESSION_START_DTTM_TZ	In the past, data in these columns could be unreliable due to issues with local computer clocks. This information is no longer provided.
MEDIA_DETAILS_EXT	START_TM END_TM	In the past, this table contained multiple records per video that indicated which continuous sections of a video were viewed. The majority of columns such as DETAIL_ID, MEDIA_URI_TXT, MEDIA_NM, MEDIA_DISPLAY_DURATION_SECS, INTERACTION_CNT, EXIT_POINT_SECS, MAX_PLAY_SECS, VIEW_DURATION_SECS, PLAY_END_DTTM, and PLAY_END_DTTM_TZ were duplicated across these records. Instead of providing these derived records, the new MEDIA_ACTIVITY_DETAILS table contains more detailed interactions with videos in the form of START and STOP actions. In addition, the MEDIA_DETAILS_EXT table now contains only one record per MEDIA_URI_TXT and LOAD_ID combination in a given range. For more information, see “New Tables” on page 1025.

PROMOTION DISPLAYED	DERIVED_DISPLAY_FLG	In the past, batch processing in SAS Customer Intelligence 360 generated an artificial DISPLAY record for every promotion's USE record that had no matching display record. The SAS Customer Intelligence 360 Streaming Data Platform cannot look back to determine whether there is a promotion DISPLAY record for a given promotion USE record, as those records could be separated by minutes or even by hours. The new platform produces only promotion DISPLAY and promotion USE records that it can detect based on specific configurations. This could result in promotion DISPLAY records that have no matching promotion USE records.
BUSINESS_PROCESS_DETAILS	NEXT_DETAIL_ID	In the SAS Customer Intelligence 360 Streaming Data Platform, SAS Customer Intelligence 360 cannot wait for data that depends on a subsequent page being loaded. Therefore, this column is no longer being populated. To determine which page or pages a user visited after a business process step, the BUSINESS_PROCESS_DETAILS table is joined to the PAGE_DETAILS table using the DETAIL_ID column. Then, the next record in the PAGE_DETAILS table is found based on the DETAIL_DTTM column.

Duplicate Records

The SAS Customer Intelligence 360 Streaming Data Platform no longer removes duplicate records, which could result in two similar or identical event configurations producing the same output. To assist users in identifying rules that might cause duplicates, the EVENT_DESIGNED_ID and EVENT_NM columns have been added to tables where appropriate. For more information, see “New Columns” on page 1026.

New Tables

BUSINESS_PROCESS_DETAILS_EXT, CART_ACTIVITY_DETAILS_EXT, GOAL_DETAILS_EXT, and SEARCH_RESULTS_EXT

New tables exist that contain optional fields that might never be populated or might be populated by an event that occurs later. The new tables are:

- BUSINESS_PROCESS_DETAILS_EXT
- CART_ACTIVITY_DETAILS_EXT
- GOAL_DETAILS_EXT
- SEARCH_RESULTS_EXT

By writing the optional fields to these new _EXT tables, the system can continue to stream data without waiting on a future event that might never occur. The original tables still contain the appropriate fields, which preserves the existing table structure and the order of columns in downloaded CSV files. The _EXT tables contain records only when a value is derived from an event that is different from the actual activity.

For example, if the goal revenue is extracted from the same event as the goal itself, the GOAL_REVENUE column is found in the GOAL_DETAILS table. However, if the goal revenue is extracted from a subsequent event, which could occur at any time after the initial event or might never occur, the GOAL_REVENUE column is instead found in the GOAL_DETAILS_EXT table.

These new _EXT tables must be joined to the corresponding _DETAILS tables using link key columns that end in _SK. Follow these rules when creating the SQL statement:

- Use a LEFT JOIN on the link key columns, since records in the _EXT tables are optional.
- Use the COALESCE function when you access the column names to select the non-empty value from either the _EXT table or the _DETAILS table.

For example, the query to get the goal revenue amount would look like this:

```
SELECT t1.goal_group_nm,
       t1.goal_nm,
       t1.goal_reached_dttm_tz,
       /* GOAL_REVENUE_AMT */
       (coalesce(t1.goal_revenue_amt,t2.goal_revenue_amt)) AS GOAL_REVENUE_AMT
FROM GOAL_DETAILS t1
LEFT JOIN GOAL_DETAILS_EXT t2
ON (t1.goal_details_sk = t2.goal_details_sk);
```

MEDIA_ACTIVITY_DETAILS

The new MEDIA_ACTIVITY_DETAILS table provides a record for every interaction with a video or audio player. Every interaction (PAUSE, SKIP, or REWIND) is represented as single start or stop action, or a combination of start and stop actions:

- A PAUSE is represented by a stop action followed by a start action, where PLAYHEAD_POSITION for both actions is identical. The Delta between ACTION_DTTMs is equal to the duration of the PAUSE.
- A SKIP is represented by a stop action followed by a start action, where PLAYHEAD_POSITION for the start is greater than PLAYHEAD_POSITION for the stop. The two PLAYHEAD_POSITIONs taken together indicate the position in the video from which a user skipped to a later part.

- A REWIND is represented by a stop action followed by a start action, where PLAYHEAD_POSITION for the start is less than PLAYHEAD_POSITION for the stop.

New Values

The SAS Customer Intelligence 360 Streaming Data Platform unifies all SAS Customer Intelligence 360 and SAS 360 Engage: Digital data into a single and more expansive SAS Customer Intelligence 360 data model. These changes were made to the values in tables:

- Missing data in any column is now represented in the CSV file as an empty string (that is, as two delimiters with nothing in between).
- Values such as “N/A”, “--”, or “not available” no longer exist.
- The ACTIVITY_CD column in the CART_ACTIVITY_DETAILS table now contains values for cartAdd and cartRemove. In the past, the column contained values for Add Failed, Added, Removed, and Purchased values.
- The ERROR_ACTIVITY_CD column in the new CART_ACTIVITY_DETAILS_EXT table contains a value for cartAddFailed.

In addition to these changes, an extension to the data model is planned for later in 2019. This extension will standardize and adjust some hardcoded values.

New Columns

EVENT_DESIGNED_ID and EVENT_NM

Many tables other than those that end in _EXT now include two new columns called EVENT_DESIGNED_ID and EVENT_NM. These new columns contain event configurations that are responsible for creating the associated rows in the tables.

This information enables users to easily determine which event configurations are producing a particular result and might require attention if values are not as expected or rows are duplicated for tables and records that are generated from event configurations. Tables such as SESSION_DETAILS, VISIT_DETAILS, PAGE_DETAILS, and PAGE_ERRORS that are populated even without configurations do not contain these columns.

SESSION_EXPIRATION_DTTM and SESSION_EXPIRATION_DTTM_TZ

The SESSION_DETAILS_EXT table now includes two new columns called SESSION_EXPIRATION_DTTM and SESSION_EXPIRATION_DTTM_TZ. These new columns contain the timestamp representing the point in time that SAS Customer Intelligence 360 declares a session expired. The data collection mechanism assigns a new session ID if new information comes from an associated visitor after the expiration timestamp.

A session expires when either of these time-outs are reached:

- When there has not been any activity for the defined session time-out (30 minutes by default), SESSION_EXPIRATION_DTTM is equal to the sum of LAST_SESSION_ACTIVITY_DTTM plus SESSION_TIMEOUT.
- When the maximum session duration (12 hours by default) is reached, SESSION_EXPIRATION_DTTM is equal to the sum of SESSION_START_DTTM plus the maximum session duration.

The SESSION_EXPIRATION_DTTM column is in UTC and the SESSION_EXPIRATION_DTTM_TZ column is in a tenant’s defined time zone. This action is performed in the settings, as described in detail at "Page and Session" on page 34.

Hexadecimal IDs

All DETAIL_ID, VISIT_ID, and SESSION_ID (including PREVIOUS_SESSION_ID) columns are numeric representations of the original hexadecimal values that are used in data collection and shown in the events and session cookies. To correlate session IDs that are visible in the browser with the data in the tables, these hexadecimal values are now included in the tables, as well.

Some software encounters difficulty in handling the resulting long integer values. To account for this, SAS Customer Intelligence 360 Streaming Data Platform retains the numeric version in its typical location and includes the original hexadecimal version in these columns:

- DETAIL_ID_HEX
- PREVIOUS_SESSION_ID_HEX
- SESSION_ID_HEX
- VISIT_ID_HEX

Use these hexadecimal columns whenever possible to avoid issues with long integers.

Backward Compatibility

To support backward compatibility, the schema for the SAS Customer Intelligence 360 Streaming Data Platform is additive to the existing data model. To avoid ETL failures, make sure to use the correct schema version for mapping downloaded data. ETL processes should use the schema version that is implemented to map the downloaded data (which might include newer columns) and ignore any extra columns at the end.

For example, if you are using a previous version of the schema, ETL processes that consume the first *n* columns of table data must be designed to read *only* the first *n* columns and ignore any data beyond that.

When your on-premises database tables are adjusted, and you are ready to receive newer data, you can request the new version of the schema through the SAS Customer Intelligence 360 Download API.

Session Details

The SESSION_DETAILS table provides information about visitor sessions on your website. This information includes a wide range of data about your visitors. For example, you can use this table to determine the web browsers that visitors use, identify the geographic location of visitors, and identify the origination that brought the visitor to your website.

A *session* is a period of activity that starts when a visitor first accesses your website and ends when the web browser is closed or the session is inactive longer than the specified time-out period.

For example, a single session occurs when a visitor uses a single instance of a web browser to access your website, navigates to a different website, and then later returns to your website.

Figure A2.1 How a Session Is Measured

The time-out period is set in SAS Customer Intelligence 360. The default time-out period is 30 minutes, and the period can set to a value that is between 1 minute and 24 hours.

Table A2.31 SESSION_DETAILS

Column Name	Data Type	Description
BROWSER_NM	VARCHAR(52)	Name of the web browser (for example, Firefox or Google Chrome).
BROWSER_VERSION_NO	VARCHAR(16)	Version number of the web browser.
COUNTRY_NM	VARCHAR(85)	Country.
COUNTRY_CD	VARCHAR(2)	Country code.
STATE_REGION_CD	VARCHAR(2)	State.
REGION_NM	VARCHAR(256)	Region.
CITY_NM	VARCHAR(390)	City.
LATITUDE	DECIMAL(13,6)	Latitude coordinate.
LONGITUDE	DECIMAL(13,6)	Longitude coordinate.
IP_ADDRESS	VARCHAR(64)	IP address of the machine that made a request to the web server. This address can be for the visitor's machine or an ISP proxy server.
ORGANIZATION_NM	VARCHAR(256)	Organization name.
POSTAL_CD	VARCHAR(13)	Postal code.
METRO_CD	BIGINT(20)	Metropolitan area code.

DEVICE_NM	VARCHAR(85)	Name of the device from which the session was created (for example, iPad, Kindle, or PS3). The value of this column is always `PC` if the DEVICE_TYPE_NM value in the table is PC.
DEVICE_TYPE_NM	VARCHAR(32)	Type of device that triggers the session (for example, set_top_box, or pc).
PLATFORM_DESC	VARCHAR(78)	Operating system of the client visiting the website, as derived from the user agent.
PLATFORM_TYPE_NM	VARCHAR(52)	Operating system type (for example, PC, console, or mobile device).
PROFILE_NM1	VARCHAR(169)	Segmentation name (such as Profile1, Profile2, and so on.) These names identify the segment.
PROFILE_NM2	VARCHAR(169)	Segmentation name (such as Profile1, Profile2, and so on.) These names identify the segment.
PROFILE_NM3	VARCHAR(169)	Segmentation name (such as Profile1, Profile2, and so on.) These names identify the segment.
PROFILE_NM4	VARCHAR(169)	Segmentation name (such as Profile1, Profile2, and so on.) These names identify the segment.
PROFILE_NM5	VARCHAR(169)	Segmentation name (such as Profile1, Profile2, and so on.) These names identify the segment.
SESSION_ID	VARCHAR(29)	Primary key in numeric representation.
SESSION_DT	DATE	Date on which the session started.
SESSION_START_DTTM	TIMESTAMP	UTC datetimestamp of when the session started.
SESSION_START_DTTM_TZ	TIMESTAMP	Datetimestamp of when the session started in the local time zone.
CLIENT_SESSION_START_DTTM	TIMESTAMP	Deprecated; always null.

CLIENT_SESSION_START_DTTM_TZ	TIMESTAMP	Deprecated; always null.
PREVIOUS_SESSION_ID	VARCHAR(29)	Previous session ID in numeric representation, assuming that the current session is a continuation because the previous session had timed out.
FLASH_VERSION_NO	VARCHAR(16)	Version of Adobe Flash that is used.
FLASH_ENABLED_FLG	CHAR(1)	Flag that indicates whether Adobe Flash is enabled. The value of this column is set to `1` if the FLASH_VERSION_NO column value is not blank.
JAVA_VERSION_NO	VARCHAR(12)	Version of Java that is installed.
JAVA_ENABLED_FLG	CHAR(1)	Flag that indicates whether Java is enabled.
JAVA_SCRIPT_ENABLED_FLG	CHAR(1)	Flag that indicates whether JavaScript is enabled. The value of this column is always `1`.
COOKIES_ENABLED_FLG	CHAR(1)	Flag that indicates whether permanent cookies are enabled.
USER_LANGUAGE_CD	VARCHAR(12)	Language code from the web browser. May not match normalization output exactly.
SCREEN_COLOR_DEPTH_NO	INT(11)	Color depth of the display that the visitor used to view web pages during the session.
SCREEN_SIZE_TXT	VARCHAR(12)	Screen dimensions.
USER_AGENT_NM	VARCHAR(512)	User agent information that is sent by the web browser to the web server.

NEW_VISITOR_FLG	VARCHAR(2)	Flag that is set when the session is for a first-time visitor with a unique visitor cookie. Here are the possible values: `New` specifies that the session is from a new visitor who did not have a targeting cookie on the machine when the visitor arrived on your site. The visitor might not have a cookie because the visitor has never been to the site, has deleted the cookies on the machine, or is using a device or browser that the visitor has never used before on the site. `Existing` specifies that the session is from a returning visitor who already has a targeting cookie when the visitor arrives on your site.
SESSION_TIMEOUT	INT(11)	Session time-out in milliseconds as defined in administration.
VISITOR_ID	VARCHAR(32)	Unique visitor tracking cookie ID that is retrieved from SAS Customer Intelligence 360.
IDENTITY_ID	VARCHAR(36)	Alphanumeric number that represents a customer.
LOAD_DTTM	TIMESTAMP	Internal UTC datetimestamp of when the record was loaded.
SESSION_ID_HEX	VARCHAR(29)	Primary key in hexadecimal representation.
PREVIOUS_SESSION_ID_HEX	VARCHAR(29)	Previous session ID in hexadecimal representation, assuming that the current session is a continuation because the previous session had timed out.
SESSION_DT_TZ	DATE	Date on which the session started in the local time zone.
CHANNEL_NM	VARCHAR(40)	Type of channel (for example, web and mobile).
APP_ID	VARCHAR(36)	Mobile application ID.

APP_VERSION	VARCHAR(10)	Mobile application version.
SDK_VERSION	VARCHAR(25)	Version of the SDK.
PLATFORM_VERSION	VARCHAR(25)	Version of the platform.
DEVICE_LANGUAGE	VARCHAR(12)	Language set for the device.
MANUFACTURER	VARCHAR(75)	Manufacturer of the device.
MOBILE_COUNTRY_CODE	VARCHAR(10)	Mobile country code.
NETWORK_CODE	INT(11)	Mobile network code.
CARRIER_NAME	VARCHAR(36)	Mobile carrier name.
IS_PORTABLE_FLAG	BOOLEAN	Flag that indicates whether the device is portable. Mobile devices are set to `true`.

The SESSION_DETAILS_EXT table provides various summarized information about visitor sessions. Important columns in this table are LAST_SESSION_ACTIVITY_DTTM, LAST_SESSION_ACTIVITY_DTTM_TZ, ACTIVE_SEC_SPENT_IN_SESSN_CNT, and SECONDS_SPENT_IN_SESSION_CNT.

Table A2.32 *SESSION_DETAILS_EXT*

Column Name	Data Type	Description
SESSION_ID	VARCHAR(29)	Foreign key to the SESSION_DETAILS table in numeric representation.
ACTIVE_SEC_SPENT_IN_SESSN_CNT	BIGINT(20)	Length of time that a visitor spends on the website, excluding all periods of inactivity. Periods of inactivity are periods of time when no activity such as clicks, scrolls, or text changes occur for at least two minutes. The value of this column is updated over time if there is new activity.
LAST_SESSION_ACTIVITY_DTTM	TIMESTAMP	UTC datetimestamp of the last session activity, in milliseconds. The value of this column is updated over time if there is new activity.

LAST_SESSION_ACTIVITY_DTTM_TZ	TIMESTAMP	Datetimestamp of the last session activity, in milliseconds. The value of this column is updated over time if there is new activity in the local time zone.
SECONDS_SPENT_IN_SESSION_CNT	BIGINT(20)	Number of seconds a visitor spent in the session from session start to last activity, including all periods of inactivity.
LOAD_DTTM	TIMESTAMP	Internal UTC datetimestamp of when the record was loaded.
SESSION_EXPIRATION_DTTM	TIMESTAMP	Datetimestamp of when the session expired.
SESSION_EXPIRATION_DTTM_TZ	TIMESTAMP	Datetimestamp of when the session expired in the local time zone.
SESSION_ID_HEX	VARCHAR(29)	Foreign key to the SESSION_DETAILS table in hexadecimal representation.

Visit Details

The VISIT_DETAILS table contains a record for every visitor's entry to your website from an external source, including the initial session start. This record is often called a *visit*.

SAS Customer Intelligence 360 writes a new record in this table for these scenarios:

- a new session starts.
- the value for the referrer of a page does not match the approved domains. The value for the referrer is `external`.
- the value for the referrer of a page is empty, but the landing page matches a campaign configuration such as a query string or landing page URL.
- the value for the referrer of a page is empty, but the landing page is one of the campaign home pages (also known as a built-in Brand Aware campaign).

Note: For the latter three scenarios, a new record is not written if the URL and referrer are the same as the last attribution record. The solution assumes that the user returned to the landing page by using the back button on the web browser.

The following example shows how sessions are tracked:

1. A visitor clicks a link in an email and is directed to your website. Session ID 21396559864666328281803280445 begins.
2. The visitor views a few pages on your website.
3. The visitor leaves your website, goes to a search engine, and views several pages from another website.

4 The visitor returns to the search engine and clicks a link that directs back to your website. If the web browser was open during all of the preceding steps and the last visit was a short time ago, then the visitor's return to your website is still considered Session ID 2139655986466328281803280445.

Note: The session cookie expires after a certain amount of inactivity, usually 30 minutes, or when the web browser is closed. Inactivity is defined as no events sent to data collection in SAS Customer Intelligence 360. You can define the inactivity time-out period to be as short as 1 minute and as long as 24 hours.

This table provides an audit trail of every external entry into your website, enabling you to build your own attribution model.

Table A2.33 *VISIT_DETAILS*

Column Name	Data Type	Description
VISIT_ID	VARCHAR(32)	Primary key in numeric representation.
ORIGINATION_NM	VARCHAR(260)	Origination name.
ORIGINATION_TYPE_NM	VARCHAR(65)	Origination type.
ORIGINATION_PLACEMENT_NM	VARCHAR(390)	Name of ad placement within an origination.
ORIGINATION_CREATIVE_NM	VARCHAR(260)	Name of creative material within an origination.
ORIGINATION_TRACKING_CD	VARCHAR(65)	Tracking code that identifies the origination.
REFERRER_DOMAIN_NM	VARCHAR(215)	Referring domain.
REFERRER_TXT	VARCHAR(1332)	Referring URL.
SEARCH_ENGINE_DOMAIN_TXT	VARCHAR(215)	Domain of search engine (for example, google.com, google.de, and google.co.uk).
SEARCH_ENGINE_DESC	VARCHAR(130)	Description of search engine (for example, Google, Yahoo, or Bing).
SEARCH_TERM_TXT	VARCHAR(1332)	Text that is entered into a search engine.
SESSION_ID	VARCHAR(29)	Foreign key to the SESSION_DETAILS table in numeric representation.

VISIT_DTTM	TIMESTAMP	UTC datetimestamp of when the re-entry and continuation of the session occurred. May not match normalization output exactly.
VISIT_DTTM_TZ	TIMESTAMP	Datetimestamp of when the re-entry and continuation of the session occurred in the local time zone.
SEQUENCE_NO	SMALLINT(6)	Number that indicates the order of the external entries into the session. A value of 1 indicates that this is the first external entry, also known as the session start.
REFERRER_QUERY_STRING_TXT	VARCHAR(1332)	Value of the query string for the referring page.
IDENTITY_ID	VARCHAR(36)	Alphanumeric number that represents a customer.
LOAD_DTTM	TIMESTAMP	Internal UTC datetimestamp of when the record was loaded.
VISIT_ID_HEX	VARCHAR(32)	Primary key in hexadecimal representation.
SESSION_ID_HEX	VARCHAR(29)	Foreign key to the SESSION_DETAILS table in hexadecimal representation.

Page Details

The PAGE_DETAILS table provides information about page views and a visitor's experience accessing a page. For example, you can use this table to see how long it takes for a given page to load in a visitor's web browser.

Table A2.34 *PAGE_DETAILS*

Column Name	Data Type	Description
DETAIL_ID	VARCHAR(32)	Primary key in numeric representation.
SESSION_ID	VARCHAR(29)	Foreign key to the SESSION_DETAILS table in numeric representation.
VISIT_ID	VARCHAR(32)	Foreign key to the VISIT_DETAILS table in numeric representation.

SESSION_DT	DATE	Date on which the session started.
DETAIL_DTTM	TIMESTAMP	UTC datetimestamp of when the page view occurred.
DETAIL_DTTM_TZ	TIMESTAMP	Datetimestamp of when the page view occurred in the local time zone.
BYTES_SENT_CNT	INT(11)	Actual size of the file that the web browser loads.
PAGE_LOAD_SEC_CNT	BIGINT(20)	Number of seconds that the web browser takes to load and display a page without embedded images.
PAGE_COMPLETE_SEC_CNT	BIGINT(20)	Number of seconds that the web browser takes to load and display a page, including embedded images on the page. Image load time and page load time could be = 0.
WINDOW_SIZE_TXT	VARCHAR(20)	Size, in pixels, of the real viewable space inside the web browser. This is the area that is available to display the web page, excluding toolbars, status bars, address bars, scroll bars, menus, and panes.
DOMAIN_NM	VARCHAR(165)	Domain name. This is the portion of the URL between :// and /. It is an identification string that defines a website (for example, www.sas.com/ and support.sas.com).
PROTOCOL_NM	VARCHAR(8)	Protocol name (for example, http or https).
CLASS1_ID	VARCHAR(650)	First classification of pages that are defined by the second alias definition in the Page category configuration. Use this classification to define the main sections of the website that you want to include in the customer activities.

CLASS2_ID	VARCHAR(650)	Second classification of pages that are defined by the third alias definition in the Page category configuration. Use this classification to define the main sections of the website that you want to include in the customer activities.
CLASS3_ID	VARCHAR(650)	Third classification of pages that are defined by the fourth alias definition in the Page category configuration. Use this classification to define the main sections of the website that you want to include in the customer activities.
CLASS4_ID	VARCHAR(650)	Fourth classification of pages that are defined by the fifth alias definition in the Page category configuration. Use this classification to define the main sections of the website that you want to include in the customer activities.
CLASS5_ID	VARCHAR(650)	Fifth classification of pages that are defined by the sixth alias definition in the Page category configuration. Use this classification to define the main sections of the website that you want to include in the customer activities.
CLASS6_ID	VARCHAR(650)	Sixth classification of pages that are defined by the seventh alias definition in the Page category configuration. Use this classification to define the main sections of the website that you want to include in the customer activities.
CLASS7_ID	VARCHAR(650)	Seventh classification of pages that are defined by the eighth alias definition in the Page category configuration. Use this classification to define the main sections of the website that you want to include in the customer activities.

CLASS8_ID	VARCHAR(650)	Eighth classification of pages that are defined by the ninth alias definition in the Page category configuration. Use this classification to define the main sections of the website that you want to include in the customer activities.
CLASS9_ID	VARCHAR(650)	Ninth classification of pages that are defined by the 10th alias definition in the Page category configuration. Use this classification to define the main sections of the website that you want to include in the customer activities.
CLASS10_ID	VARCHAR(650)	Tenth classification of pages that are defined by the 11th alias definition in the Page category configuration. Use this classification to define the main sections of the website that you want to include in the customer activities.
CLASS11_ID	VARCHAR(650)	Eleventh classification of pages that are defined by the 12th alias definition in the Page category configuration. Use this classification to define the main sections of the website that you want to include in the customer activities.
CLASS12_ID	VARCHAR(650)	Twelfth classification of pages that are defined by the 13th alias definition in the Page category configuration. Use this classification to define the main sections of the website that you want to include in the customer activities.
CLASS13_ID	VARCHAR(650)	Thirteenth classification of pages that are defined by the 14th alias definition in the Page category configuration. Use this classification to define the main sections of the website that you want to include in the customer activities.

CLASS14_ID	VARCHAR(650)	Fourteenth classification of pages that are defined by the 15th alias definition in the Page category configuration. Use this classification to define the main sections of the website that you want to include in the customer activities.
CLASS15_ID	VARCHAR(650)	Fifteenth classification of pages that are defined by the 16th alias definition in the Page category configuration. Use this classification to define the main sections of the website that you want to include in the customer activities.
PAGE_URL_TXT	VARCHAR(1332)	Unique URL that identifies a page. The value of this column is set in the first alias definition in the Page category configuration.
PAGE_DESC	VARCHAR(1332)	Page title.
URL_DOMAIN	VARCHAR(215)	Domain of the page URL (for example, vmwwin7501.na.sas.com and shop.frankfurt-airport.com).
IDENTITY_ID	VARCHAR(36)	Alphanumeric number that represents a customer.
LOAD_DTTM	TIMESTAMP	Internal UTC datetimestamp of when the record was loaded.
SESSION_DT_TZ	DATE	Date on which the session started in the local time zone.
DETAIL_ID_HEX	VARCHAR(32)	Primary key in hexadecimal representation.
VISIT_ID_HEX	VARCHAR(32)	Foreign key to the VISIT_DETAILS table in hexadecimal representation.
SESSION_ID_HEX	VARCHAR(29)	Foreign key to the SESSION_DETAILS table in hexadecimal representation.

The PAGE_DETAILS_EXT table contains additional attributes about page views.

Table A2.35 PAGE_DETAILS_EXT

Column Name	Data Type	Description
DETAIL_ID	VARCHAR(32)	Foreign key to the PAGE_DETAILS table in numeric representation.
ACTIVE_SEC_SPENT_ON_PAGE_CNT	INT(11)	Number of seconds that a visitor spent viewing a page.
SECONDS_SPENT_ON_PAGE_CNT	INT(11)	Number of seconds that the page was loaded in the web browser.
SESSION_ID	VARCHAR(29)	Foreign key to the SESSION_DETAILS table in numeric representation.
LOAD_DTTM	TIMESTAMP	Internal UTC datetimestamp of when the record was loaded.
DETAIL_ID_HEX	VARCHAR(32)	Foreign key to the PAGE_DETAILS table in hexadecimal representation.
SESSION_ID_HEX	VARCHAR(29)	Foreign key to the SESSION_DETAILS table in hexadecimal representation.

Carts

The CART_ACTIVITY_DETAILS, ORDER_DETAILS, and ORDER_SUMMARY tables provide information about visitor activity in relation to virtual shopping carts. This information includes adding and removing products as well as checking out and purchasing pages. The information in these tables is based on the **Cart** configurations that you define in SAS Customer Intelligence 360.

The CART_ACTIVITY_DETAILS table contains one record for each cart add and cart remove action. Cart additions are collected from the product detail pages and cart removals are collected from the cart page. There are many ways to add products to a cart. For example, many websites allow customers to add products to a cart directly from a product overview or search results page. However, SAS Customer Intelligence 360 does not utilize some methods and thus products could be found in the ORDER_DETAILS table without a matching add record in the CART_ACTIVITY_DETAILS table.

The ORDER_DETAILS table contains line items for orders and can be joined to the ORDER_SUMMARY table using the DETAIL_ID column. It contains one record for each line and includes items such as product details, quantity, and price based on the configuration.

The ORDER_SUMMARY table contains one row for each cart, checkout, or order confirmation view. It contains attributes that are relevant to a cart such as total value, tax, and shipping costs. The ORDER_SUMMARY table does not contain any details about products in a cart. These details can be found in the

ORDER_DETAILS table. A new record is created in the ORDER_SUMMARY table each time a user loads the cart, checkout, or order confirmation page. This table does not provide information about the contents of a cart at any given moment. It only contains data when a customer actually views the relevant pages.

For more information, see "Cart" on page 335.

Note: The CART_ACTIVITY_DETAILS_SK column is comprised of the DETAIL_ID, PRODUCT_ID, PRODUCT_NM, PRODUCT_SKU, ACTIVITY_CD, ACTIVITY_DTTM, and EVENT_NM columns.

Table A2.36 CART_ACTIVITY_DETAILS

Column Name	Data Type	Description
PRODUCT_NM	VARCHAR(130)	Product name defined during configuration.
PRODUCT_GROUP_NM	VARCHAR(130)	Product group name. This value can be derived from a product name or a lookup table, based on ID or SKU.
PRODUCT_ID	VARCHAR(130)	Unique identifier defined in SAS Customer Intelligence 360 during configuration.
PRODUCT_SKU	VARCHAR(100)	Unit for keeping stock.
CURRENCY_CD	VARCHAR(6)	Currency (such as USD) that is displayed with the product.
ACTIVITY_CD	VARCHAR(20)	Action related to the specified product. Here are the possible values: cartAdd cartRemove
ACTIVITY_DTTM	TIMESTAMP	UTC datetimestamp of when the shopping cart activity occurred.
ACTIVITY_DTTM_TZ	TIMESTAMP	Datetimestamp of when the shopping cart activity occurred in the local time zone.
CART_ID	VARCHAR(42)	ID of the cart, if available.
DISPLAYED_CART_ITEMS_NO	INT(11)	Total cart items that are displayed after a basket action. For example, this value might be the total cart items from a cart summary that is displayed on the product page.

DISPLAYED_CART_AMT	DECIMAL(17,2)	Total cart amount that is displayed after a basket action. For example, this value might be the total cart amount from a cart summary that is displayed on the product page.
QUANTITY_VAL	INT(11)	Quantity of the product that is involved in the action.
UNIT_PRICE_AMT	DECIMAL(17,2)	Unit price of the product.
DETAIL_ID	VARCHAR(32)	Foreign key to the PAGE_DETAILS table in numeric representation.
VISIT_ID	VARCHAR(32)	Foreign key to the VISIT_DETAILS table in numeric representation.
SESSION_ID	VARCHAR(29)	Foreign key to the SESSION_DETAILS table in numeric representation.
IDENTITY_ID	VARCHAR(36)	Alphanumeric number that represents a customer.
LOAD_DTTM	TIMESTAMP	Internal UTC datetimestamp of when the record was loaded.
EVENT_DESIGNED_ID	VARCHAR(36)	ID of the event configuration that generated this business process step record.
EVENT_NM	VARCHAR(256)	Name of the event configuration that generated this business process step record, as shown in the interface.
CART_ACTIVITY_DETAILS _SK	VARCHAR(32)	Foreign key to link to the CART_ACTIVITY_DETAILS _EXT table.
DETAIL_ID_HEX	VARCHAR(32)	Foreign key to the PAGE_DETAILS table in hexadecimal representation.
VISIT_ID_HEX	VARCHAR(32)	Foreign key to the VISIT_DETAILS table in hexadecimal representation.
SESSION_ID_HEX	VARCHAR(29)	Foreign key to the SESSION_DETAILS table in hexadecimal representation.

The CART_ACTIVITY_DETAILS_EXT table contains additional data, along with a unique surrogate key that is generated based on the unique fields (md5 hash) of the

CART_ACTIVITY_DETAILS table. This surrogate key can be used to join and associate rows of the two tables.

Table A2.37 CART_ACTIVITY_DETAILS_EXT

Column Name	Data Type	Description
CART_ACTIVITY_DETAILS_SK	VARCHAR(32)	Foreign key to link to the CART_ACTIVITY_DETAILS table.
ERROR_ACTIVITY_CD	VARCHAR(20)	Populated with “cartAddFailed” if a subsequent event determines that the add operation has failed.
LOAD_DTTM	TIMESTAMP	Internal UTC datetimestamp of when the record was loaded.
EVENT_DESIGNED_ID	VARCHAR(36)	ID of the event configuration that generated this business process step record.

Table A2.38 ORDER_DETAILS

Column Name	Data Type	Description
PRODUCT_NM	VARCHAR(130)	Product name defined during configuration.
PRODUCT_GROUP_NM	VARCHAR(130)	Product group name. This value can be derived from a product name or a lookup table, based on ID or SKU.
PRODUCT_ID	VARCHAR(130)	Unique identifier defined in SAS Customer Intelligence 360 during configuration.
PRODUCT_SKU	VARCHAR(100)	Unit for keeping stock.
CURRENCY_CD	VARCHAR(6)	Currency (such as USD) that is displayed with the product.

RECORD_TYPE	VARCHAR(15)	Has possible values of “cartView”, “checkout”, and “order”. If the value of this column is “cartView”, then the data in this record was collected from the shopping cart/basket page and shows the content of the shopping cart/basket at the moment that the user viewed it. If the value of this column is “checkout”, then the data in this record was collected from the check-out page and indicates an intent to purchase (but not a completed purchase) by the visitor. If the value of this column is “order”, then the data was collected from an order confirmation page and an actual purchase has occurred.
QUANTITY_AMT	INT(11)	Number of units in the shopping cart.
UNIT_PRICE_AMT	DECIMAL(17,2)	Price per unit.
AVAILABILITY_MESSAGE_TEXT	VARCHAR(650)	Availability message that is displayed. Examples of availability messages are “In Stock” and “Back Ordered.”
SAVING_MESSAGE_TXT	VARCHAR(650)	Savings message that is displayed. An example of a savings message is “Buy One Get One Half Price!”
SHIPPING_MESSAGE_TXT	VARCHAR(650)	Shipping message that is displayed. An example of a shipping message is “Ships within five business days.”
DETAIL_ID	VARCHAR(32)	Foreign key to the PAGE_DETAILS table in numeric representation.
VISIT_ID	VARCHAR(32)	Foreign key to the VISIT_DETAILS table in numeric representation.
SESSION_ID	VARCHAR(29)	Foreign key to the SESSION_DETAILS table in numeric representation.
IDENTITY_ID	VARCHAR(36)	Alphanumeric number that represents a customer.
LOAD_DTTM	TIMESTAMP	Internal UTC datetimestamp of when the record was loaded.

EVENT_DESIGNED_ID	VARCHAR(36)	ID of the event configuration that generated this business process step record.
EVENT_NM	VARCHAR(256)	Name of the event configuration that generated this business process step record, as shown in the interface.
DETAIL_ID_HEX	VARCHAR(32)	Foreign key to the PAGE_DETAILS table in hexadecimal representation.
VISIT_ID_HEX	VARCHAR(32)	Foreign key to the VISIT_DETAILS table in hexadecimal representation.
SESSION_ID_HEX	VARCHAR(29)	Foreign key to the SESSION_DETAILS table in hexadecimal representation.

Table A2.39 *ORDER_SUMMARY*

Column Name	Data Type	Description
ACTIVITY_DTTM	TIMESTAMP	UTC datetimestamp of when the activity occurred.
ACTIVITY_DTTM_TZ	TIMESTAMP	Datetimestamp of when the activity occurred in the local time zone.
CART_ID	VARCHAR(42)	ID of the cart, if available.
RECORD_TYPE	VARCHAR(15)	Has possible values of “cartView”, “checkout”, and “order”. If the value of this column is “cartView”, then the data in this record was collected from the shopping cart/basket page and shows the content of the shopping cart/basket at the moment that the user viewed it. If the value of this column is “checkout”, then the data in this record was collected from the check-out page and indicates an intent to purchase (but not a completed purchase) by the visitor. If the value of this column is “order”, then the data was collected from an order confirmation page and an actual purchase has occurred.

CURRENCY_CD	VARCHAR(6)	Currency (such as USD) that is displayed with the product.
DELIVERY_TYPE_DESC	VARCHAR(42)	Delivery type that is selected in the check-out or order.
ORDER_ID	VARCHAR(42)	Identification of the actual order, as opposed to the cart view or check-out view.
PAYMENT_TYPE_DESC	VARCHAR(42)	Payment type that is selected in the check-out or order.
SHIPPING_AMT	DECIMAL(17,2)	Shipping cost that is displayed in the cart or order.
TOTAL_PRICE_AMT	DECIMAL(17,2)	Total price of all items in the shopping cart or order.
TOTAL_TAX_AMT	DECIMAL(17,2)	Amount of tax that is displayed in the cart or order.
SHIPPING_COUNTRY_NM	VARCHAR(85)	Shipping country name.
SHIPPING_STATE_REGION_CD	VARCHAR(256)	Shipping state name.
SHIPPING_CITY_NM	VARCHAR(390)	Shipping city name.
SHIPPING_POSTAL_CD	VARCHAR(10)	Shipping country ZIP code.
BILLING_COUNTRY_NM	VARCHAR(85)	Billing country name.
BILLING_STATE_REGION_CD	VARCHAR(256)	Billing state name.
BILLING_CITY_NM	VARCHAR(390)	Billing city name.
BILLING_POSTAL_CD	VARCHAR(10)	Billing ZIP code.
DETAIL_ID	VARCHAR(32)	Foreign key to the PAGE_DETAILS table in numeric representation.
VISIT_ID	VARCHAR(32)	Foreign key to the VISIT_DETAILS table in numeric representation.
SESSION_ID	VARCHAR(29)	Foreign key to the SESSION_DETAILS table in numeric representation.

IDENTITY_ID	VARCHAR(36)	Alphanumeric number that represents a customer.
LOAD_DTTM	TIMESTAMP	Internal UTC datetimestamp of when the record was loaded.
EVENT_DESIGNED_ID	VARCHAR(36)	ID of the event configuration that generated this business process step record.
EVENT_NM	VARCHAR(256)	Name of the event configuration that generated this business process step record, as shown in the interface.
DETAIL_ID_HEX	VARCHAR(32)	Foreign key to the PAGE_DETAILS table in hexadecimal representation.
VISIT_ID_HEX	VARCHAR(32)	Foreign key to the VISIT_DETAILS table in hexadecimal representation.
SESSION_ID_HEX	VARCHAR(29)	Foreign key to the SESSION_DETAILS table in hexadecimal representation.

Custom Attributes

The CUSTOM_ATTRIBUTES table contains information about attributes that do not fit in any of the predefined subject areas such as goals or transactions.

Table A2.40 *CUSTOM_ATTRIBUTES*

Column Name	Data Type	Description
ATTRIB_NM	VARCHAR(32)	Name of the custom attribute.
ATTRIB_VAL	VARCHAR(650)	Value of the custom attribute.
ATTRIB_DTTM	TIMESTAMP	UTC datetimestamp of the custom attribute.
ATTRIB_DTTM_TZ	TIMESTAMP	Datetimestamp of the custom attribute in the local time zone.
DETAIL_ID	VARCHAR(32)	Foreign key to the PAGE_DETAILS table in numeric representation.

VISIT_ID	VARCHAR(32)	Foreign key to the VISIT_DETAILS table in numeric representation.
SESSION_ID	VARCHAR(29)	Foreign key to the SESSION_DETAILS table in numeric representation.
IDENTITY_ID	VARCHAR(36)	Alphanumeric number that represents a customer.
LOAD_DTTM	TIMESTAMP	Internal UTC datetimestamp of when the record was loaded.
DETAIL_ID_HEX	VARCHAR(32)	Foreign key to the PAGE_DETAILS table in hexadecimal representation.
VISIT_ID_HEX	VARCHAR(32)	Foreign key to the VISIT_DETAILS table in hexadecimal representation.
SESSION_ID_HEX	VARCHAR(29)	Foreign key to the SESSION_DETAILS table in hexadecimal representation.

Document Details

The DOCUMENT_DETAILS table provides information about how visitors attempt to download documents from your website. The information in this table is based on the **Document Downloads** configurations that you set in SAS Customer Intelligence 360. For more information, see "Manage Document Download Types" on page 332.

Table A2.41 *DOCUMENT_DETAILS*

Column Name	Data Type	Description
URI_TXT	VARCHAR(1332)	URI link of the document.
ALT_TXT	VARCHAR(1332)	Alternate text of the link to a document. If the link includes text, then that text is used for this value. If the link does not include text, then the alternate text in the HTML code is used, if available.
LINK_ID	VARCHAR(1332)	HTML object ID of the link tag.
LINK_NAME	VARCHAR(1332)	HTML object name of the link tag.

LINK_SELECTOR_PATH	VARCHAR(1332)	Exact location, which includes the path of the element that was clicked within the page.
LINK_EVENT_DTTM	TIMESTAMP	UTC datetimestamp of when the document was accessed.
LINK_EVENT_DTTM_TZ	TIMESTAMP	Datetimestamp of when the document was accessed in the local time zone.
DETAIL_ID	VARCHAR(32)	Foreign key to the PAGE_DETAILS table in numeric representation.
VISIT_ID	VARCHAR(32)	Foreign key to the VISIT_DETAILS table in numeric representation.
SESSION_ID	VARCHAR(29)	Foreign key to the SESSION_DETAILS table in numeric representation.
IDENTITY_ID	VARCHAR(36)	Alphanumeric number that represents a customer.
LOAD_DTTM	TIMESTAMP	Internal UTC datetimestamp of when the record was loaded.
DETAIL_ID_HEX	VARCHAR(32)	Foreign key to the PAGE_DETAILS table in hexadecimal representation.
VISIT_ID_HEX	VARCHAR(32)	Foreign key to the VISIT_DETAILS table in hexadecimal representation.
SESSION_ID_HEX	VARCHAR(29)	Foreign key to the SESSION_DETAILS table in hexadecimal representation.

Page Errors

The PAGE_ERRORS table provides information about the type of JavaScript errors that a visitor experiences on your website. JavaScript errors are automatically added.

Table A2.42 *PAGE_ERRORS*

Column Name	Data Type	Description

IN_PAGE_ERROR_TXT	VARCHAR(260)	Error text, as retrieved from the web browser, in the language of the web browser.
ERROR_LOCATION_TXT	VARCHAR(41)	Additional information about the error. For example, this value might be the line number of a JavaScript error if the web browser provides this information. If no additional text is available, the value of this column is a space. A comma (",") is used as the separator between the line and column numbers denoting the location of the error (line: 0, column: 0).
IN_PAGE_ERROR_DTTM	TIMESTAMP	UTC datetimestamp of when the error occurred.
IN_PAGE_ERROR_DTTM_TZ	TIMESTAMP	Datetimestamp of when the error occurred in the local time zone.
DETAIL_ID	VARCHAR(32)	Foreign key to the PAGE_DETAILS table in numeric representation.
VISIT_ID	VARCHAR(32)	Foreign key to the VISIT_DETAILS table in numeric representation.
SESSION_ID	VARCHAR(29)	Foreign key to the SESSION_DETAILS table in numeric representation.
IDENTITY_ID	VARCHAR(36)	Alphanumeric number that represents a customer.
LOAD_DTTM	TIMESTAMP	Internal UTC datetimestamp of when the record was loaded.
DETAIL_ID_HEX	VARCHAR(32)	Foreign key to the PAGE_DETAILS table in hexadecimal representation.
VISIT_ID_HEX	VARCHAR(32)	Foreign key to the VISIT_DETAILS table in hexadecimal representation.
SESSION_ID_HEX	VARCHAR(29)	Foreign key to the SESSION_DETAILS table in hexadecimal representation.

Form Details

The FORM_DETAILS table provides information about how visitors interact with the forms on your website to enter information. For example, you can use this table to monitor the number of fields that a visitor completes in a form. You can also use this information to understand how long visitors take to enter data in the form fields.

By analyzing visitor behavior and visitor interactions with the forms on your website, you can determine whether there are specific barriers that deter visitors from completing a form. You can use this information to troubleshoot and improve the effectiveness of your forms.

This table is based on the configurations that you define in SAS Customer Intelligence 360. For more information, see "Form" on page 336.

Table A2.43 *FORM_DETAILS*

Column Name	Data Type	Description
FORM_NM	VARCHAR(65)	Form name, as configured when defining the rules.
FORM_FIELD_NM	VARCHAR(325)	Name of a field in the form, as collected from the website.
FORM_FIELD_ID	VARCHAR(325)	ID of a field in the form, as collected from the website.
FORM_FIELD_DETAIL_DTTM	TIMESTAMP	UTC datetimestamp of when the user interacted with the form field.
FORM_FIELD_DETAIL_DTTM_TZ	TIMESTAMP	Datetimestamp of when the user interacted with the form field in the local time zone.
FORM_FIELD_VALUE	VARCHAR(2600)	Value entered in the form field. This value might be obscured, depending on your configuration for how to collect form values.
ATTEMPT_INDEX_CNT	INT(11)	Number of the attempt to complete a form. For example, a visitor's third attempt to complete and submit a form is assigned an attempt number value of 3.

ATTEMPT_STATUS_CD	VARCHAR(42)	Status of the current attempt when the field changed or the form is submitted. Each value is preceded by an order or hierarchy number. Possible values are as follows: 0_Not Submitted: The visitor is interacting with the form, filling in fields, or has recently loaded the form page. 3_Submitted Successfully: The form was submitted and the visitor was directed to a **Success** page.
CHANGE_INDEX_NO	INT(11)	Number of times that the field value was changed from its original value within the current attempt. A value of `0` indicates that the visitor did not change the form field within the current attempt. A value of `1` or more indicates that the user changed the form field value one or more times in the given attempt. FORM_FIELD_VALUE is always the value after the last change.
SUBMIT_FLG	CHAR(1)	Flag that indicates whether the visitor attempted to submit the form. A value of `0` indicates that the information in this record is not from a form submission but from interacting with the form. A value of `1` indicates that the information in this record is from a form submission.
DETAIL_ID	VARCHAR(32)	Foreign key to the PAGE_DETAILS table in numeric representation.
VISIT_ID	VARCHAR(32)	Foreign key to the VISIT_DETAILS table in numeric representation.
SESSION_ID	VARCHAR(29)	Foreign key to the SESSION_DETAILS table in numeric representation.
IDENTITY_ID	VARCHAR(36)	Alphanumeric number that represents a customer.

LOAD_DTTM	TIMESTAMP	Internal UTC datetimestamp of when the record was loaded.
DETAIL_ID_HEX	VARCHAR(32)	Foreign key to the PAGE_DETAILS table in hexadecimal representation.
VISIT_ID_HEX	VARCHAR(32)	Foreign key to the VISIT_DETAILS table in hexadecimal representation.
SESSION_ID_HEX	VARCHAR(29)	Foreign key to the SESSION_DETAILS table in hexadecimal representation.

Goal Details

The GOAL_DETAILS table provides information about the goals visitors achieve when accessing your website. *Goals* are events that are relevant to your business. These goals are events that you want to analyze or report on, but they are not defined in different subject areas such as product views, purchases, or business processes.

Typically, goals represent important steps in a visitor's interaction with the website. For example, a goal might be registration for a newsletter or using a mortgage calculator.

Note: The GOAL_DETAILS table contains all of the previous fields with null values for any fields containing no information.

Note: The GOAL_DETAILS_SK column is comprised of the DETAIL_ID, GOAL_NM, GOAL_GROUP_NM, GOAL_REACHED_DTTM, and EVENT_NM columns.

Table A2.44 *GOAL_DETAILS*

Column Name	Data Type	Description
GOAL_NM	VARCHAR(260)	Goal name.
GOAL_GROUP_NM	VARCHAR(130)	Goal group name.
GOAL_REVENUE_AMT	DECIMAL(17,2)	Revenue amount that is associated with the goal. Only populated when revenue is derived from the same event as the goal itself. Otherwise, this value can be found in the GOAL_DETAILS_EXT table.
GOAL_REACHED_DTTM	TIMESTAMP	UTC datetimestamp of when the goal was reached.
GOAL_REACHED_DTTM_TZ	TIMESTAMP	Datetimestamp of when the goal was reached in the local time zone.

DETAIL_ID	VARCHAR(32)	Foreign key to the PAGE_DETAILS table in numeric representation.
VISIT_ID	VARCHAR(32)	Foreign key to the VISIT_DETAILS table in numeric representation.
SESSION_ID	VARCHAR(29)	Foreign key to the SESSION_DETAILS table in numeric representation.
IDENTITY_ID	VARCHAR(36)	Alphanumeric number that represents a customer.
LOAD_DTTM	TIMESTAMP	Internal UTC datetimestamp of when the record was loaded.
EVENT_DESIGNED_ID	VARCHAR(36)	ID of the event configuration that generated this business process step record.
EVENT_NM	VARCHAR(256)	Name of the event configuration that generated this business process step record, as shown in the interface.
GOAL_DETAILS_SK	VARCHAR(32)	Foreign key to link to the GOAL_DETAILS_EXT table.
DETAIL_ID_HEX	VARCHAR(32)	Foreign key to the PAGE_DETAILS table in hexadecimal representation.
VISIT_ID_HEX	VARCHAR(32)	Foreign key to the VISIT_DETAILS table in hexadecimal representation.
SESSION_ID_HEX	VARCHAR(29)	Foreign key to the SESSION_DETAILS table in hexadecimal representation.

The GOAL_DETAILS_EXT table contains additional data, along with a unique surrogate key that is generated based on the unique fields (md5 hash) of the GOAL_DETAILS table. This surrogate key can be used to join and associate rows of the two tables.

Table A2.45 *GOAL_DETAILS_EXT*

Column Name	Data Type	Description
GOAL_DETAILS_SK	VARCHAR(32)	Foreign key to link to the GOAL_DETAILS table.

GOAL_REVENUE_AMT	DECIMAL(17,2)	Revenue amount that is associated with the goal. Only populated when revenue is not derived from the same event as the goal itself. Otherwise, this value can be found in the GOAL_DETAILS table.
LOAD_DTTM	TIMESTAMP	Internal UTC datetimestamp of when the record was loaded.
EVENT_DESIGNED_ID	VARCHAR(36)	ID of the event configuration that generated this business process step record.

Identity

The IDENTITY table lists the current identities. This is the full list of active identities in the system.

Table A2.46 *IDENTITY*

Column Name	Data Type	Description
IDENTITY_ID	VARCHAR(36)	Alphanumeric number that represents a customer.

The IDENTITY_ATTRIBUTES table contains one record per IDENTITY_ID per identifier type for customer ID, login ID, and subject ID. You might find it useful to transpose rows to columns so that there is one record per identity. The IDENTITY_ATTRIBUTES table contains the individual identifier values according to the definition of attributes. When joining other tables that contain IDENTITY_ID with this table, users might need to use left joins to obtain only matching content, as this table contains only records with known identifiers (as opposed to containing all identities). You must also join with the IDENTITY_MAP table in order to be assured of obtaining all data.

Table A2.47 *IDENTITY_ATTRIBUTES*

Column Name	Data Type	Description
IDENTIFIER_TYPE_ID	VARCHAR(36)	Type of identity (customer ID, login ID, or subject ID). Usually linked with source.
USER_IDENTIFIER_VAL	VARCHAR(5000)	Identifier value, commonly referred to as the channel user ID. The value of this column is immutable.
IDENTITY_ID	VARCHAR(36)	Alphanumeric number that represents a customer.

ENTRYTIME	TIMESTAMP	UTC datetimestamp mapped or merged in the SAS Customer Intelligence 360 identity service.
PROCESSED_DTTM	TIMESTAMP	Internal UTC datetimestamp of when the record was loaded.

The IDENTITY_MAP table references the current identity ID with historical identity IDs (the source-to-target mappings). The TARGET_IDENTITY_ID is the most current identity ID. When joining other tables that contain IDENTITY_ID with this table, however, users might need to use left joins to obtain current or merged identities for a given identity, as this table contains records only if an identity was ever merged.

Table A2.48 *IDENTITY_MAP*

Column Name	Data Type	Description
SOURCE_IDENTITY_ID	VARCHAR(36)	Original identity ID that the channel user ID is associated with for the event.
TARGET_IDENTITY_ID	VARCHAR(36)	Current identity ID of the channel user based on various associations or merging along the path.
ENTRYTIME	TIMESTAMP	UTC datetimestamp mapped or merged in the SAS Customer Intelligence 360 identity service.
PROCESSED_DTTM	TIMESTAMP	Internal UTC datetimestamp of when the record was loaded.

Media Details

The MEDIA_DETAILS table provides information about the types of video or media objects that you interact with on your website and how visitors interact with these components. Most media interactions are automatically collected and provided in this table. There is one record for each unique combination of DETAIL_ID and MEDIA_URI_TXT.

Table A2.49 *MEDIA_DETAILS*

Column Name	Data Type	Description
MEDIA_NM	VARCHAR(260)	Name of the media object.
MEDIA_URI_TXT	VARCHAR(2024)	URL of the media object.

MEDIA_PLAYER_NM	VARCHAR(30)	Media player name.
MEDIA_PLAYER_VERSION_TXT	VARCHAR(20)	Media player version.
PLAY_START_DTTM	TIMESTAMP	UTC datetimestamp of when the visitor began playing the media object.
PLAY_START_DTTM_TZ	TIMESTAMP	Datetimestamp of when the visitor began playing the media object in the local time zone.
MEDIA_DURATION_SECS	DECIMAL(11,3)	Length, in seconds, of the media clip. This information is sometimes not available.
DETAIL_ID	VARCHAR(32)	Foreign key to the PAGE_DETAILS table in numeric representation.
VISIT_ID	VARCHAR(32)	Foreign key to the VISIT_DETAILS table in numeric representation.
SESSION_ID	VARCHAR(29)	Foreign key to the SESSION_DETAILS table in numeric representation.
IDENTITY_ID	VARCHAR(36)	Alphanumeric number that represents a customer.
LOAD_DTTM	TIMESTAMP	Internal UTC datetimestamp of when the record was loaded.
DETAIL_ID_HEX	VARCHAR(32)	Foreign key to the PAGE_DETAILS table in hexadecimal representation.
VISIT_ID_HEX	VARCHAR(32)	Foreign key to the VISIT_DETAILS table in hexadecimal representation.
SESSION_ID_HEX	VARCHAR(29)	Foreign key to the SESSION_DETAILS table in hexadecimal representation.

The MEDIA_DETAILS_EXT table provides summarized information about how visitors interact with video or media objects on your website. It is updated over time as media interactions continue to occur. There might be multiple records for the same combination of the MEDIA_URI_TXT and DETAIL_ID columns across hour boundaries. The most recent record based on the LOAD_DTTM column is the one with the most current values and overwrites any previously loaded records. If a specific media object does not have a record in the MEDIA_DETAILS_EXT table, then a visitor clicked on the object but did not watch any of the content. For example, the video might not have loaded or the visitor might have navigated to a new page while the media player was still loading or buffering.

For information about supported media types, see "Collecting Data from Media" on page 349.

Table A2.50 MEDIA_DETAILS_EXT

Column Name	Data Type	Description
MEDIA_NM	VARCHAR(260)	Name of the media object.
MEDIA_URI_TXT	VARCHAR(2024)	URL of the media object.
INTERACTION_CNT	INT(11)	Number of total interactions (for example, stops, pauses, rewinds, or skips) or status updates that the visitor performed with the media object while viewing it.
EXIT_POINT_SECS	DECIMAL(11,3)	Playhead time of the video when a visitor stopped viewing the video.
MAX_PLAY_SECS	DECIMAL(11,3)	Maximum playhead time of the video that a visitor reached over the course of viewing the media object. This value reflects the latest point in a video that the media player plays the video. For example, if a viewer fast forwards a video to minute five (00:05:00) and watches only 10 seconds, then the value of this column is 00:05:10.
VIEW_DURATION_SECS	DECIMAL(11,3)	Total time that a visitor spent viewing the media object.
MEDIA_DISPLAY_DURATION_SECS	DECIMAL(11,3)	Total amount of unique video content that the visitor consumes. The value of this column is based on the amount of video content that a visitor watches, not the amount of time a visitor spends watching the video. For example, if a visitor watches the same 10 seconds of a given video three times, then the value of this column is 10 seconds.
PLAY_END_DTTM	TIMESTAMP	UTC datetimestamp of when the visitor stopped playing the media object.

PLAY_END_DTTM_TZ	TIMESTAMP	Datetimestamp of when the visitor stopped playing the media object in the local time zone.
START_TM	DECIMAL(11,3)	Deprecated; always null.
END_TM	DECIMAL(11,3)	Deprecated; always null.
DETAIL_ID	VARCHAR(32)	Foreign key to the PAGE_DETAILS table in numeric representation.
LOAD_DTTM	TIMESTAMP	Internal UTC datetimestamp of when the record was loaded.
DETAIL_ID_HEX	VARCHAR(32)	Foreign key to the PAGE_DETAILS table in hexadecimal representation.

The MEDIA_ACTIVITY_DETAILS table includes individual interaction details about media resources.

Table A2.51 *MEDIA_ACTIVITY_DETAILS*

Column Name	Data Type	Description
MEDIA_NM	VARCHAR(260)	Name of the media object.
MEDIA_URI_TEXT	VARCHAR(2024)	URI of the media.
ACTION_DTTM	TIMESTAMP	UTC datetimestamp of when the product was viewed.
ACTION_DTTM_TZ	TIMESTAMP	Datetimestamp of when the product was viewed in the local time zone.
ACTION	VARCHAR(50)	Can contain “START” and “STOP” values.

PLAYHEAD_POSITION	VARCHAR(50)	Every interaction (PAUSE, SKIP, or REWIND) is represented as single play,stop record or a combination of stop and start records: A PAUSE is represented by a stop action followed by a start action, where PLAYHEAD_POSITION for both actions is identical. The Delta between ACTION_DTTMs is equal to the duration of the PAUSE. A SKIP is represented by a stop action followed by a start action, where PLAYHEAD_POSITION for the start is greater than PLAYHEAD_POSITION for the stop. The two PLAYHEAD_POSITIONs taken together indicate the position in the video from which a user skipped to a later part. A REWIND is represented by a stop action followed by a start action, where PLAYHEAD_POSTION for the start is less than PLAYHEAD_POSITION for the stop.
DETAIL_ID	VARCHAR(32)	Foreign key to the PAGE_DETAILS table in numeric representation.
DETAIL_ID_HEX	VARCHAR(32)	Foreign key to the PAGE_DETAILS table in hexadecimal representation.
LOAD_DTTM	TIMESTAMP	Internal UTC datetimestamp of when the record was loaded.

Product Views

The PRODUCT_VIEWS table provides information about what products visitors view. It is based on the products that you select in the **Product View** configurations defined in SAS Customer Intelligence 360. For more information, see “Cart” on page 335.

Table A2.52 *PRODUCT_VIEWS*

Column Name	Data Type	Description

PRODUCT_NM	VARCHAR(130)	Product name defined during configuration.
PRODUCT_GROUP_NM	VARCHAR(130)	Product group name derived from a product name or a lookup table, based on ID or SKU.
PRODUCT_ID	VARCHAR(130)	Unique identifier defined in SAS Customer Intelligence 360 during configuration.
PRODUCT_SKU	VARCHAR(100)	Unit for keeping stock.
CURRENCY_CD	VARCHAR(6)	Currency (such as USD) that is displayed with the product.
PRICE_VAL	DECIMAL(17,2)	Price of the product.
ACTION_DTTM	TIMESTAMP	UTC datetimestamp of when the product was viewed.
ACTION_DTTM_TZ	TIMESTAMP	Datetimestamp of when the product was viewed in the local time zone.
AVAILABILITY_MESSAGE_TXT	VARCHAR(650)	Availability message that is displayed. Examples of availability messages are “In Stock” and “Back Ordered.”
SAVING_MESSAGE_TXT	VARCHAR(650)	Savings message that is displayed. An example of a savings message is “Buy One Get One Half Price!”
SHIPPING_MESSAGE_TXT	VARCHAR(650)	Shipping message that is displayed. An example of a shipping message is “Ships within five business days.”
DETAIL_ID	VARCHAR(32)	Foreign key to the PAGE_DETAILS table in numeric representation.
VISIT_ID	VARCHAR(32)	Foreign key to the VISIT_DETAILS table in numeric representation.
SESSION_ID	VARCHAR(29)	Foreign key to the SESSION_DETAILS table in numeric representation.
IDENTITY_ID	VARCHAR(36)	Alphanumeric number that represents a customer.
LOAD_DTTM	TIMESTAMP	Internal UTC datetimestamp of when the record was loaded.

EVENT_DESIGNED_ID	VARCHAR(36)	ID of the event configuration that generated this business process step record.
EVENT_NM	VARCHAR(256)	Name of the event configuration that generated this business process step record, as shown in the interface.
DETAIL_ID_HEX	VARCHAR(32)	Foreign key to the PAGE_DETAILS table in hexadecimal representation.
VISIT_ID_HEX	VARCHAR(32)	Foreign key to the VISIT_DETAILS table in hexadecimal representation.
SESSION_ID_HEX	VARCHAR(29)	Foreign key to the SESSION_DETAILS table in hexadecimal representation.

Promotions

The PROMOTION_DISPLAYED and PROMOTION_USED tables provide information about the promotions that are displayed on your website and visitor interactions with these promotions.

A *promotion* is a banner, link, or advertisement on your website that is used to direct visitor traffic to a specific page or task on your website. For example, a promotion might link a visitor to a product page, a page that provides a sales offer, or a visitor registration survey. Therefore, a visitor can see and click multiple promotions during a single session and can click a single promotion more than once.

SAS Customer Intelligence 360 enables you to track each of these promotions and which ones were displayed and which were clicked. Promotions, both those displayed and those that are clicked, are defined in the **Advanced Configuration Rules** configuration in SAS Customer Intelligence 360.

For more information, see "Promotion" on page 342.

Table A2.53 PROMOTION_DISPLAYED

Column Name	Data Type	Description
PROMOTION_NM	VARCHAR(260)	Name of the promotion defined during configuration.
PROMOTION_TRACKING_CD	VARCHAR(65)	Tracking code that enables you to identify the promotion.
PROMOTION_TYPE_NM	VARCHAR(65)	Type of promotion.

PROMOTION_PLACEMENT_NM	VARCHAR(260)	Page or website location of the promotion defined in SAS Customer Intelligence 360.
PROMOTION_CREATIVE_NM	VARCHAR(260)	Description of the image or theme that is used by a given promotion defined in SAS Customer Intelligence 360.
PROMOTION_NUMBER	INT(11)	Sequence number of the promotion, as defined in the configuration rules. The value of this column is used together with sessions to link records in the PROMOTION_DISPLAYED table to records in the PROMOTION_USED table.
DISPLAY_DTTM	TIMESTAMP	UTC datetimestamp of when the promotion was displayed. When the DERIVED_DISPLAY_FLG value is `1`, the DISPLAY_DTTM value is the same as CLICK_DTTM in the PROMOTION_USED table.
DISPLAY_DTTM_TZ	TIMESTAMP	Datetimestamp of when the promotion was displayed. When the DERIVED_DISPLAY_FLG value is `1`, the DISPLAY_DTTM value is the same as CLICK_DTTM in the PROMOTION_USED table in the local time zone.
DERIVED_DISPLAY_FLG	CHAR(1)	Deprecated; always null.
DETAIL_ID	VARCHAR(32)	Foreign key to the PAGE_DETAILS table in numeric representation.
VISIT_ID	VARCHAR(32)	Foreign key to the VISIT_DETAILS table in numeric representation.
SESSION_ID	VARCHAR(29)	Foreign key to the SESSION_DETAILS table in numeric representation.
IDENTITY_ID	VARCHAR(36)	Alphanumeric number that represents a customer.
LOAD_DTTM	TIMESTAMP	Internal UTC datetimestamp of when the record was loaded.

EVENT_DESIGNED_ID	VARCHAR(36)	ID of the event configuration that generated this business process step record.
EVENT_NM	VARCHAR(256)	Name of the event configuration that generated this business process step record, as shown in the interface.
DETAIL_ID_HEX	VARCHAR(32)	Foreign key to the PAGE_DETAILS table in hexadecimal representation.
VISIT_ID_HEX	VARCHAR(32)	Foreign key to the VISIT_DETAILS table in hexadecimal representation.
SESSION_ID_HEX	VARCHAR(29)	Foreign key to the SESSION_DETAILS table in hexadecimal representation.

Table A2.54 *PROMOTION_USED*

Column Name	Data Type	Description
PROMOTION_NM	VARCHAR(260)	Name of the promotion defined during configuration.
PROMOTION_TRACKING_CD	VARCHAR(65)	Tracking code that enables you to identify the promotion.
PROMOTION_TYPE_NM	VARCHAR(65)	Type of promotion.
PROMOTION_PLACEMENT_NM	VARCHAR(260)	Page or website location of the promotion defined in SAS Customer Intelligence 360.
PROMOTION_CREATIVE_NM	VARCHAR(260)	Description of the image or theme that is used by a given promotion defined in SAS Customer Intelligence 360.
PROMOTION_NUMBER	INT(11)	Sequence number of the promotion, as defined in the configuration rules.
CLICK_DTTM	TIMESTAMP	UTC datetimestamp of when the promotion was clicked.
CLICK_DTTM_TZ	TIMESTAMP	Datetimestamp of when the promotion was clicked in the local time zone.

DETAIL_ID	VARCHAR(32)	Foreign key to the PAGE_DETAILS table in numeric representation.
VISIT_ID	VARCHAR(32)	Foreign key to the VISIT_DETAILS table in numeric representation.
SESSION_ID	VARCHAR(29)	Foreign key to the SESSION_DETAILS table in numeric representation.
IDENTITY_ID	VARCHAR(36)	Alphanumeric number that represents a customer.
LOAD_DTTM	TIMESTAMP	Internal UTC datetimestamp of when the record was loaded.
EVENT_DESIGNED_ID	VARCHAR(36)	ID of the event configuration that generated this business process step record.
EVENT_NM	VARCHAR(256)	Name of the event configuration that generated this business process step record, as shown in the interface.
DETAIL_ID_HEX	VARCHAR(32)	Foreign key to the PAGE_DETAILS table in hexadecimal representation.
VISIT_ID_HEX	VARCHAR(32)	Foreign key to the VISIT_DETAILS table in hexadecimal representation.
SESSION_ID_HEX	VARCHAR(29)	Foreign key to the SESSION_DETAILS table in hexadecimal representation.

Search Results

The SEARCH_RESULTS table provides information about how visitors use the search feature on your website and how effective their search results are. Specifically, this table captures the search term and the number of results returned.

Note: The SEARCH_RESULTS table contains all of the previous fields with null values for any fields containing no information.

Note: The SEARCH_RESULTS_SK column is comprised of the DETAIL_ID, SEARCH_NM, SRCH_FIELD_NAME, SRCH_FIELD_ID, SEARCH_RESULTS_DTTM, and EVENT_NM columns.

Table A2.55 *SEARCH_RESULTS*

Column Name	Data Type	Description

SEARCH_NM	VARCHAR(42)	Search name that is configured in SAS Customer Intelligence 360.
SEARCH_RESULTS_DTTM	TIMESTAMP	UTC datetimestamp of when the search was submitted.
SEARCH_RESULTS_DTTM_TZ	TIMESTAMP	Datetimestamp of when the search was submitted in the local time zone.
RESULTS_DISPLAYED_FLG	CHAR(1)	Flag that, when SEARCH_RESULTS_DISPLAYED is `0`, indicates whether the number of search results could not be determined (`0`) or the search returns results (`1`).
SEARCH_RESULTS_DISPLAYED	INT(11)	Number of search results that were displayed for a query. Only populated if search results are derived from the same event as a search action. Otherwise, this value can be found in the SEARCH_RESULTS_EXT table.
SRCH_PHRASE	VARCHAR(2600)	Value entered in the search field. The value of this column is the actual search phrase that a user uses to search for something.
SRCH_FIELD_NAME	VARCHAR(325)	Name of a field in the search form, as collected from the website.
SRCH_FIELD_ID	VARCHAR(325)	ID of a field in the search form, as collected from the website.
DETAIL_ID	VARCHAR(32)	Foreign key to the PAGE_DETAILS table in numeric representation.
VISIT_ID	VARCHAR(32)	Foreign key to the VISIT_DETAILS table in numeric representation.
SESSION_ID	VARCHAR(29)	Foreign key to the SESSION_DETAILS table in numeric representation.
IDENTITY_ID	VARCHAR(36)	Alphanumeric number that represents a customer.

LOAD_DTTM	TIMESTAMP	Internal UTC datetimestamp of when the record was loaded.
EVENT_DESIGNED_ID	VARCHAR(36)	ID of the event configuration that generated this business process step record.
EVENT_NM	VARCHAR(256)	Name of the event configuration that generated this business process step record, as shown in the interface.
SEARCH_RESULTS_SK	VARCHAR(32)	Foreign key to link to the SEARCH_RESULTS_EXT table.
DETAIL_ID_HEX	VARCHAR(32)	Foreign key to the PAGE_DETAILS table in hexadecimal representation.
VISIT_ID_HEX	VARCHAR(32)	Foreign key to the VISIT_DETAILS table in hexadecimal representation.
SESSION_ID_HEX	VARCHAR(29)	Foreign key to the SESSION_DETAILS table in hexadecimal representation.

The SEARCH_RESULTS_EXT table contains additional data, along with a unique surrogate key that is generated based on the unique fields (md5 hash) of the SEARCH_RESULTS table. This surrogate key can be used to join and associate rows of the two tables.

Table A2.56 *SEARCH_RESULTS_EXT*

Column Name	Data Type	Description
SEARCH_RESULTS_SK	VARCHAR(32)	Foreign key to link to the SEARCH_RESULTS table.
SEARCH_RESULTS_DISPLAYED	INT(11)	Number of search results that were displayed for a query. Only populated if search results are derived from a subsequent event following a search action. Otherwise, this value can be found in the SEARCH_RESULTS table.
LOAD_DTTM	TIMESTAMP	Internal UTC datetimestamp of when the record was loaded.
EVENT_DESIGNED_ID	VARCHAR(36)	ID of the event configuration that generated this business process step record.

Business Process Details

The BUSINESS_PROCESS_DETAILS table provides information about business processes. It is based on the **Business process** configurations that you set in SAS Customer Intelligence 360. For more information, see “Business Process” on page 334.

A *business process* is a sequence of steps that a visitor to the website must follow, resulting in a significant action or change of state. Business processes typically involve a visitor choosing various options and selections to complete complex tasks.

Purchasing insurance can be considered a business process. For example, a visitor who is purchasing insurance online might need to enter personal details such as automobile information, accident records, bank details, and so on.

Note: The BUSINESS_PROCESS_DETAILS table contains all of the previous fields with null values for any fields containing no information.

Note: The PROCESS_DETAILS_SK column is comprised of the DETAIL_ID, PROCESS_STEP_NM, STEP_ORDER_NO, PROCESS_INSTANCE_NO, PROCESS_NM, PROCESS_DTTM, and EVENT_NM columns

Table A2.57 *BUSINESS_PROCESS_DETAILS*

Column Name	Data Type	Description
PROCESS_NM	VARCHAR(130)	Business process name that is defined in the Business process configuration.
PROCESS_STEP_NM	VARCHAR(130)	Name of the step, as defined during configuration.
STEP_ORDER_NO	INT(11)	Order of the steps within the business process.

PROCESS_INSTANCE_NO	INT(11)	Number of times that a business process is attempted in a session. The first instance shows a value of `0`. The second instance shows a value of `1`, and so on. A visitor might go through the same business process more than once within a single session. If the visitor leaves halfway through the business process and later returns to step 1, this action might not necessarily mean that the visitor started a new instance. It might be considered a continuation of the previous instance of the business process that was not completed. A new business process occurs in these instances: business process has not already started. business process has already started, but a step is flagged as a termination point or the previous business process completed successfully. nonlinear business process reaches a step that is flagged as the first step. This occurs regardless of whether the previous business process has completed.
PROCESS_DTTM	TIMESTAMP	UTC datetimestamp of when the step in the business process occurred.
PROCESS_ATTEMPT_CNT	INT(11)	Sequence number, starting with 1, that indicates how often a given step was attempted within the entire process.

ATTRIBUTE1_TXT	VARCHAR(130)	First business process attributed. You can define this attribute in SAS Customer Intelligence 360. You can use these attributes to classify or segment the completed business processes. For example, if you have a 10-step process for a credit card application, you might define a business process attribute such as Card Type to segment applications by gold card and platinum card. In this case, the steps of the application (or business process) are the same. However, one application might be assigned to the gold card segment and another might be assigned to the platinum card segment. Categorizing the business process data by attribute enables you to view the business process data from different perspectives and make comparisons in your analysis.
ATTRIBUTE2_TXT	VARCHAR(130)	Second business process attribute. For more information, see the description for ATTRIBUTE1_TXT.
IS_COMPLETION_FLG	CHAR(1)	Flag that indicates whether the current step successfully completes the business process as defined.
IS_START_FLG	CHAR(1)	Flag that indicates whether the step was the first one of the business process.
PROCESS_EXCEPTION_TXT	VARCHAR(1300)	Description of the error or error message that occurred, as defined during configuration. Might be empty when error is derived from a subsequent page load, in which case the value can be found in the BUSINESS_PROCESS_DETAILS_EXT table.

PROCESS_EXCEPTION_DTTM	TIMESTAMP	UTC datetimestamp of when the error occurred. Might be empty when error is derived from a subsequent page load, in which case the value can be found in the BUSINESS_PROCESS_DETAILS_EXT table.
PROCESS_EXCEPTION_DTTM_TZ	TIMESTAMP	Datetimestamp of when the error occurred in the local time zone. Might be empty when error is derived from a subsequent page load, in which case the value can be found in the BUSINESS_PROCESS_DETAILS_EXT table.
NEXT_DETAIL_ID	VARCHAR(32)	Deprecated; always null.
DETAIL_ID	VARCHAR(32)	Foreign key to the PAGE_DETAILS table in numeric representation.
VISIT_ID	VARCHAR(32)	Foreign key to the VISIT_DETAILS table. in numeric representation.
SESSION_ID	VARCHAR(29)	Foreign key to the SESSION_DETAILS table in numeric representation.
IDENTITY_ID	VARCHAR(36)	Alphanumeric number that represents a customer.
LOAD_DTTM	TIMESTAMP	Internal UTC datetimestamp of when the record was loaded.
PROCESS_DTTM_TZ	TIMESTAMP	Datetimestamp of when the step in the business process occurred in the local time zone.
EVENT_DESIGNED_ID	VARCHAR(36)	ID of the event configuration that generated this business process step record.
EVENT_NM	VARCHAR(256)	Name of the event configuration that generated this business process step record, as shown in the interface.
PROCESS_DETAILS_SK	VARCHAR(32)	Foreign key to link to the BUSINESS_PROCESS_DETAILS_EXT table.

DETAIL_ID_HEX	VARCHAR(32)	Foreign key to the PAGE_DETAILS table in hexadecimal representation.
VISIT_ID_HEX	VARCHAR(32)	Foreign key to the VISIT_DETAILS table in hexadecimal representation.
SESSION_ID_HEX	VARCHAR(29)	Foreign key to the SESSION_DETAILS table in hexadecimal representation.

The BUSINESS_PROCESS_DETAILS_EXT table contains additional data, along with a unique surrogate key that is generated based on the unique fields (md5 hash) of the BUSINESS_PROCESS_DETAILS table. This surrogate key can be used to join and associate rows of the two tables.

Table A2.58 *BUSINESS_PROCESS_DETAILS_EXT*

Column Name	Data Type	Description
PROCESS_DETAILS_SK	VARCHAR(32)	Foreign key to link to the BUSINESS_PROCESS_DETAILS table.
PROCESS_EXCEPTION_TXT	VARCHAR(1300)	Description of the error or error message that occurred, as defined during configuration. Only populated when error text is derived from a subsequent page load. Otherwise, this value can be found in the BUSINESS_PROCESS_DETAILS table.
PROCESS_EXCEPTION_DTTM	TIMESTAMP	UTC datetimestamp of when the error occurred. Only populated when error text is derived from a subsequent page load. Otherwise, this value can be found in the BUSINESS_PROCESS_DETAILS table.
PROCESS_EXCEPTION_DTTM_TZ	TIMESTAMP	Datetimestamp of when the error occurred in the local time zone. Only populated when error text is derived from a subsequent page load. Otherwise, this value can be found in the BUSINESS_PROCESS_DETAILS table.
LOAD_DTTM	TIMESTAMP	Internal UTC datetimestamp of when the record was loaded.

EVENT_DESIGNED_ID	VARCHAR(36)	ID of the event configuration that generated this business process step record.

Discover 2.0

The information in the detail mart tables is used in the Discover base tables. The Discover base tables are used to create the predefined reports that are available from the SAS Customer Intelligence 360 landing page. For more information, see “Discover Base Table Mart Tables and Columns” on page 1108.

The detail mart tables are downloaded from the SAS Customer Intelligence 360 Download API. For more information, see “Downloading Data from SAS Customer Intelligence 360” on page 870.

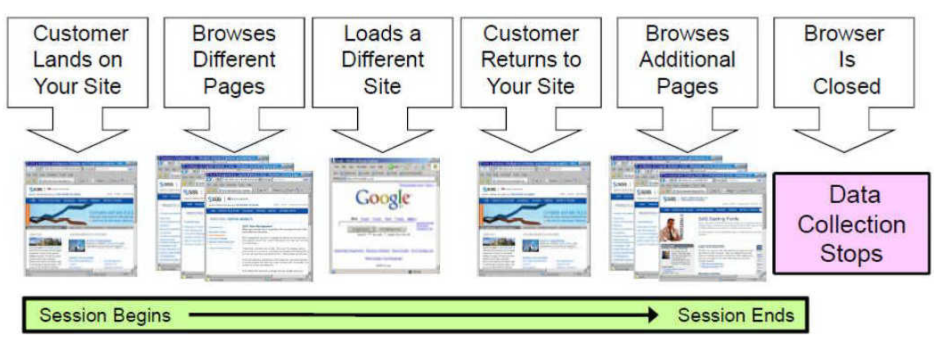
Session Details

The SESSION_DETAILS table provides information about visitor sessions on your website. This information includes a wide range of data about your visitors. For example, you can use this table to determine the web browsers that visitors use, identify the geographic location of visitors, and identify the origination that brought the visitor to your website.

A *session* is a period of activity that starts when a visitor first accesses your website and ends when the web browser is closed or the session is inactive longer than the specified time-out period.

For example, a single session occurs when a visitor uses a single instance of a web browser to access your website, navigates to a different website, and then later returns to your website.

Figure A2.2 *How a Session Is Measured*



If a session is inactive for a period of time that is longer than the time-out period, then the session automatically ends. For example, if the time-out period is 30 minutes and a session experiences more than 30 minutes of inactivity, then the session is automatically ended. If the visitor returns to the website later, a second session begins, even if the user did not close the web browser between sessions.

The time-out period is set in SAS Customer Intelligence 360. The default time-out period is 30 minutes, and the period can set to a value that is between 1 minute and 24 hours.

Table A2.59 SESSION_DETAILS

Column Name	Data Type	Description
SESSION_ID	VARCHAR(29)	Primary key.
BROWSER_NM	VARCHAR(52)	Name of the web browser (for example, Firefox or Google Chrome).
BROWSER_VERSION_NO	VARCHAR(16)	Version number of the web browser.
CITY_NM	VARCHAR(390)	City.
COOKIES_ENABLED_FLG	CHAR(1)	Flag that indicates whether permanent cookies are enabled.
COUNTRY_CD	VARCHAR(2)	Country code.
COUNTRY_NM	VARCHAR(85)	Country.
DEVICE_NM	VARCHAR(85)	Name of the device from which the session was created (for example, iPad, Kindle, or PS3). The value of this column is always `PC` if the DEVICE_TYPE_NM value in the table is PC.
DEVICE_TYPE_NM	VARCHAR(32)	Type of device that triggers the session (for example, set_top_box, or pc).
PLATFORM_TYPE_NM	VARCHAR(52)	Operating system type (for example, PC, console, or mobile device).
FLASH_VERSION_NO	VARCHAR(16)	Version of Adobe Flash that is used.
IP_ADDRESS	VARCHAR(64)	IP address of the machine that made a request to the web server. This address can be for the visitor's machine or an ISP proxy server.
JAVA_ENABLED_FLG	CHAR(1)	Flag that indicates whether Java is enabled.
JAVA_VERSION_NO	VARCHAR(12)	Version of Java that is installed.
USER_LANGUAGE_CD	VARCHAR(12)	Language code from the web browser.
LATITUDE	DECIMAL(13,6)	Latitude coordinate.

LONGITUDE	DECIMAL(13,6)	Longitude coordinate.
ORGANIZATION_NM	VARCHAR(256)	Organization name.
PLATFORM_DESC	VARCHAR(78)	Operating system of the client visiting the website, as derived from the user agent.
PREVIOUS_SESSION_ID	VARCHAR(29)	Previous session, assuming that the current session is a continuation because the previous session had timed out.
STATE_REGION_CD	VARCHAR(2)	State.
REGION_NM	VARCHAR(256)	Region.
SCREEN_COLOR_DEPTH_NO	INT	Color depth of the display that the visitor used to view web pages during the session.
SCREEN_SIZE_TXT	VARCHAR(12)	Screen dimensions.
VISITOR_ID	VARCHAR(32)	Unique visitor tracking cookie ID that is retrieved from SAS Customer Intelligence 360.
USER_AGENT_NM	VARCHAR(512)	User agent information that is sent by the web browser to the web server.
PROFILE_NM1	VARCHAR(169)	Segmentation name (such as Profile1, Profile2, and so on.) These names identify the segment.
PROFILE_NM2	VARCHAR(169)	Segmentation name (such as Profile1, Profile2, and so on.) These names identify the segment.
PROFILE_NM3	VARCHAR(169)	Segmentation name (such as Profile1, Profile2, and so on.) These names identify the segment.
PROFILE_NM4	VARCHAR(169)	Segmentation name (such as Profile1, Profile2, and so on.) These names identify the segment.
PROFILE_NM5	VARCHAR(169)	Segmentation name (such as Profile1, Profile2, and so on.) These names identify the segment.

SESSION_TIMEOUT	INT	Session time-out in milliseconds as defined in administration.
METRO_CD	BIGINT	Metropolitan area code.
NEW_VISITOR_FLG	VARCHAR(2)	Flag that is set when the session is for a first-time visitor with a unique visitor cookie. Here are the possible values: 1 specifies that the session is from a new visitor who did not have a targeting cookie on the machine when the visitor arrived on your site. The visitor might not have a cookie because the visitor has never been to the site, has deleted the cookies on the machine, or is using a device or browser that the visitor has never used before on the site. 0 specifies that the session is from a returning visitor who already has a targeting cookie when the visitor arrives on your site.
POSTAL_CD	VARCHAR(13)	Postal code.
FLASH_ENABLED_FLG	CHAR(1)	Flag that indicates whether Adobe Flash is enabled. The value of this column is set to 1 if the FLASH_VERSION_NO column value is not blank.
SESSION_DT	DATE	Date on which the session started.
JAVA_SCRIPT_ENABLED_FLG	CHAR(1)	Flag that indicates whether JavaScript is enabled. The value of this column is always 1.
IDENTITY_ID	VARCHAR(36)	Alphanumeric number that represents a customer.

CLIENT_SESSION_START_DTTM	TIMESTAMP	UTC datetime stamp of when the client's session started, based on the client's clock. This information can be unreliable and can change in the middle of a session when the client's clock is adjusted. For best results, use the SESSION_START_DTTM value that is based on the server's clock.
CLIENT_SESSION_START_DTTM_TZ	TIMESTAMP	Datetime stamp of when the client's session started, based on the client's clock. This information can be unreliable and can change in the middle of a session when the client's clock is adjusted. For best results, use the SESSION_START_DTTM value that is based on the server's clock in the local time zone.
SESSION_START_DTTM	TIMESTAMP	UTC datetime stamp of when the session started.
SESSION_START_DTTM_TZ	TIMESTAMP	Datetime stamp of when the session started in the local time zone.
LOAD_DTTM	TIMESTAMP	Internal UTC datetime stamp of when the record was loaded.

The SESSION_DETAILS_EXT table provides various summarized information about visitor sessions. Important columns in this table are LAST_SESSION_ACTIVITY_DTTM, LAST_SESSION_ACTIVITY_DTTM_TZ, ACTIVE_SEC_SPENT_IN_SESSN_CNT, and SECONDS_SPENT_IN_SESSION_CNT.

Note: The session is the main entity in the data model. All activities are assigned and linked to a session and, therefore, a record in the SESSION_DETAILS_EXT table.

Table A2.60 *SESSION_DETAILS_EXT*

Column Name	Data Type	Description
SESSION_ID	VARCHAR(29)	Foreign key to the SESSION_DETAILS table.

ACTIVE_SEC_SPENT_IN_SESSN_CNT	BIGINT	Length of time that a visitor spends on the website, excluding all periods of inactivity. Periods of inactivity are periods of time when no activity such as clicks, scrolls, or text changes occur for at least two minutes. The value of this column is updated over time if there is new activity.
SECONDS_SPENT_IN_SESSION_CNT	BIGINT	Number of seconds a visitor spent in the session from session start to last activity, including all periods of inactivity.
LAST_SESSION_ACTIVITY_DTTM	TIMESTAMP	UTC datetime stamp of the last session activity, in milliseconds. The value of this column is updated over time if there is new activity.
LAST_SESSION_ACTIVITY_DTTM_TZ	TIMESTAMP	Datetime stamp of the last session activity, in milliseconds. The value of this column is updated over time if there is new activity in the local time zone.
LOAD_DTTM	TIMESTAMP	Internal UTC datetime stamp of when the record was loaded.

Visit Details

The VISIT_DETAILS table contains a record for every visitor's entry to your website from an external source, including the initial session start. This record is often called a *visit*.

SAS Customer Intelligence 360 writes a new record in this table for these scenarios:

- a new session starts.
- the value for the referrer of a page does not match the SITE configuration. The value for the referrer is `external`.
- the value for the referrer of a page is empty, but the landing page matches a campaign configuration such as a query string or landing page URL.
- the value for the referrer of a page is empty, but the landing page is one of the campaign home pages (also known as a built-in Brand Aware campaign).

Note: For the latter three scenarios, a new record is not written if the URL and referrer are the same as the last attribution record. The solution assumes that the user returned to the landing page by using the back button on the web browser.

The following example shows how sessions are tracked:

1 A visitor clicks a link in an email and is directed to your website. Session 456 begins.

2 The visitor views a few pages on your website.

3 The visitor leaves your website, goes to a search engine, and views several pages from another website.

4 The visitor returns to the search engine and clicks a link that directs back to your website. If the web browser was open during all of the preceding steps and the last visit was a short time ago, then the visitor's return to your website is still considered Session 456.

   Note: The session cookie expires after a certain amount of inactivity, usually 30 minutes, or when the web browser is closed. Inactivity is defined as no events sent to data collection in SAS Customer Intelligence 360. You can define the inactivity time-out period to be as short as 1 minute and as long as 24 hours.

This table provides an audit trail of every external entry into your website, enabling you to build your own attribution model.

Table A2.61 VISIT_DETAILS

Column Name	Data Type	Description
SESSION_ID	VARCHAR(29)	Foreign key to the SESSION_DETAILS table.
VISIT_ID	VARCHAR(32)	Primary key.
ORIGINATION_TYPE_NM	VARCHAR(65)	Origination type.
ORIGINATION_NM	VARCHAR(260)	Origination name.
SEARCH_TERM_TXT	VARCHAR(1332)	Text that is entered into a search engine.
REFERRER_TXT	VARCHAR(1332)	Referring URL.
ORIGINATION_CREATIVE_NM	VARCHAR(260)	Name of creative material within an origination.
SEARCH_ENGINE_DOMAIN_TXT	VARCHAR(215)	Domain of search engine (for example, google.com, google.de, or google.co.uk).
REFERRER_DOMAIN_NM	VARCHAR(215)	Referring domain.
ORIGINATION_PLACEMENT_NM	VARCHAR(390)	Name of ad placement within an origination.
SEARCH_ENGINE_DESC	VARCHAR(130)	Description of search engine (for example, Google, Yahoo, or Bing).
ORIGINATION_TRACKING_CD	VARCHAR(65)	Tracking code that identifies the origination.

SEQUENCE_NO	SMALLINT	Number that indicates the order of the external entries into the session. A value of 1 indicates that this is the first external entry, also known as the session start.
REFERRER_QUERY_STRING	VARCHAR(1332)	Value of the query string for the referring page.
IDENTITY_ID	VARCHAR(36)	Alphanumeric number that represents a customer.
VISIT_DTTM	TIMESTAMP	UTC datetime stamp of when the re-entry and continuation of the session occurred.
VISIT_DTTM_TZ	TIMESTAMP	Datetime stamp of when the re-entry and continuation of the session occurred in the local time zone.
LOAD_DTTM	TIMESTAMP	Internal UTC datetime stamp of when the record was loaded.

Page Details

The PAGE_DETAILS table provides information about page views and a visitor's experience accessing a page. For example, you can use this table to see how long it takes for a given page to load in a visitor's web browser.

Table A2.62 *PAGE_DETAILS*

Column Name	Data Type	Description
DETAIL_ID	VARCHAR(32)	Primary key.
SESSION_ID	VARCHAR(29)	Foreign key to the SESSION_DETAILS table.
VISIT_ID	VARCHAR(32)	Foreign key to the VISIT_DETAILS table.
WINDOW_SIZE_TXT	VARCHAR(20)	Size, in pixels, of the real viewable space inside the web browser. This is the area that is available to display the web page, excluding toolbars, status bars, address bars, scroll bars, menus, and panes.
SESSION_DT	DATE	Date on which the session started.

PAGE_URL_TXT	VARCHAR(1332)	Unique URL that identifies a page. The value of this column is set in the first alias definition in the Page category configuration.
DOMAIN_NM	VARCHAR(165)	Domain name. This is the portion of the URL between :// and /. It is an identification string that defines a website. For example, www.sas.com/ and support.sas.com are valid values.
BYTES_SENT_CNT	INT	Actual size of the file that the web browser loads.
PAGE_LOAD_SEC_CNT	BIGINT	Number of seconds that the web browser takes to load and display a page without embedded images.
PAGE_COMPLETE_SEC_CNT	BIGINT	Number of seconds that the web browser takes to load and display a page, including embedded images on the page.
PROTOCOL_NM	VARCHAR(8)	Protocol name (for example, http or https).
PAGE_DESC	VARCHAR(1332)	Page title.
CLASS1_ID	VARCHAR(650)	First classification of pages that are defined by the second alias definition in the Page category configuration. Use this classification to define the main sections of the website that you want to include in the customer activities.
CLASS2_ID	VARCHAR(650)	Second classification of pages that are defined by the third alias definition in the Page category configuration. Use this classification to define the main sections of the website that you want to include in the customer activities.

CLASS3_ID	VARCHAR(650)	Third classification of pages that are defined by the fourth alias definition in the Page category configuration. Use this classification to define the main sections of the website that you want to include in the customer activities.
CLASS4_ID	VARCHAR(650)	Fourth classification of pages that are defined by the fifth alias definition in the Page category configuration. Use this classification to define the main sections of the website that you want to include in the customer activities.
CLASS5_ID	VARCHAR(650)	Fifth classification of pages that are defined by the sixth alias definition in the Page category configuration. Use this classification to define the main sections of the website that you want to include in the customer activities.
CLASS6_ID	VARCHAR(650)	Sixth classification of pages that are defined by the seventh alias definition in the Page category configuration. Use this classification to define the main sections of the website that you want to include in the customer activities.
CLASS7_ID	VARCHAR(650)	Seventh classification of pages that are defined by the eighth alias definition in the Page category configuration. Use this classification to define the main sections of the website that you want to include in the customer activities.
CLASS8_ID	VARCHAR(650)	Eighth classification of pages that are defined by the ninth alias definition in the Page category configuration. Use this classification to define the main sections of the website that you want to include in the customer activities.

CLASS9_ID	VARCHAR(650)	Ninth classification of pages that are defined by the 10th alias definition in the Page category configuration. Use this classification to define the main sections of the website that you want to include in the customer activities.
CLASS10_ID	VARCHAR(650)	Tenth classification of pages that are defined by the 11th alias definition in the Page category configuration. Use this classification to define the main sections of the website that you want to include in the customer activities.
CLASS11_ID	VARCHAR(650)	Eleventh classification of pages that are defined by the 12th alias definition in the Page category configuration. Use this classification to define the main sections of the website that you want to include in the customer activities.
CLASS12_ID	VARCHAR(650)	Twelfth classification of pages that are defined by the 13th alias definition in the Page category configuration. Use this classification to define the main sections of the website that you want to include in the customer activities.
CLASS13_ID	VARCHAR(650)	Thirteenth classification of pages that are defined by the 14th alias definition in the Page category configuration. Use this classification to define the main sections of the website that you want to include in the customer activities.
CLASS14_ID	VARCHAR(650)	Fourteenth classification of pages that are defined by the 15th alias definition in the Page category configuration. Use this classification to define the main sections of the website that you want to include in the customer activities.

CLASS15_ID	VARCHAR(650)	Fifteenth classification of pages that are defined by the 16th alias definition in the Page category configuration. Use this classification to define the main sections of the website that you want to include in the customer activities.
URL_DOMAIN	VARCHAR(215)	Domain of the page URL (for example, vmwwin7501.na.sas.com and shop.frankfurt-airport.com).
IDENTITY_ID	VARCHAR(36)	Alphanumeric number that represents a customer.
DETAIL_DTTM	TIMESTAMP	UTC datetime stamp of when the page view occurred.
DETAIL_DTTM_TZ	TIMESTAMP	Datetime stamp of when the page view occurred in the local time zone.
LOAD_DTTM	TIMESTAMP	Internal UTC datetime stamp of when the record was loaded.

The PAGE_DETAILS_EXT table contains additional attributes about page views.

Table A2.63 *PAGE_DETAILS_EXT*

Column Name	Data Type	Description
DETAIL_ID	VARCHAR(32)	Foreign key to the PAGE_DETAILS table.
SESSION_ID	VARCHAR(29)	Foreign key to the SESSION_DETAILS table.
ACTIVE_SEC_SPENT_ON_PAGE_CNT	INT	Number of seconds that a visitor spent viewing a page.
SECONDS_SPENT_ON_PAGE_CNT	INT	Number of seconds that the page was loaded in the web browser.
LOAD_DTTM	TIMESTAMP	Internal UTC datetime stamp of when the record was loaded.

Carts

The CART_ACTIVITY_DETAILS, ORDER_DETAILS, and ORDER_SUMMARY tables provide information about visitor activity in relation to virtual shopping carts. This information includes adding and removing products as well as checking out and purchasing pages. The information in these tables is based on the **Cart** configurations that you define in SAS Customer Intelligence 360. For more information, see "Cart" on page 335.

Note: The data in these tables might be sparse based on the limitations of data collection and the configurations that you set while defining the rules.

Table A2.64 *CART_ACTIVITY_DETAILS*

Column Name	Data Type	Description
DETAIL_ID	VARCHAR(32)	Foreign key to the PAGE_DETAILS table.
SESSION_ID	VARCHAR(29)	Foreign key to the SESSION_DETAILS table.
VISIT_ID	VARCHAR(32)	Foreign key to the VISIT_DETAILS table.
PRODUCT_ID	VARCHAR(130)	Unique identifier defined in SAS Customer Intelligence 360 during configuration.
PRODUCT_NM	VARCHAR(130)	Product name defined during configuration.
PRODUCT_SKU	VARCHAR(100)	Unit for keeping stock.
ACTIVITY_CD	VARCHAR(20)	Action related to the specified product. Here are the possible values: Add Failed Added Removed Increased Quantity Decreased Quantity Purchased
DISPLAYED_CART_AMT	DECIMAL(17,2)	Total cart amount that is displayed after a basket action. For example, this value might be the total cart amount from a cart summary that is displayed on the product page.
CART_ID	VARCHAR(42)	ID of the cart, if available.
UNIT_PRICE_AMT	DECIMAL(17,2)	Unit price of the product.

CURRENCY_CD	VARCHAR(6)	Currency (such as USD) that is displayed with the product.
DISPLAYED_CART_ITEMS_NO	INT	Total cart items that are displayed after a basket action. For example, this value might be the total cart items from a cart summary that is displayed on the product page.
QUANTITY_VAL	INT	Quantity of the product that is involved in the action.
PRODUCT_GROUP_NM	VARCHAR(130)	Product group name. This value can be derived from a product name or a lookup table, based on ID or SKU.
IDENTITY_ID	VARCHAR(36)	Alphanumeric number that represents a customer.
ACTIVITY_DTTM	TIMESTAMP	UTC datetime stamp of when the shopping cart activity occurred.
ACTIVITY_DTTM_TZ	TIMESTAMP	Datetime stamp of when the shopping cart activity occurred in the local time zone.
LOAD_DTTM	TIMESTAMP	Internal UTC datetime stamp of when the record was loaded.

Table A2.65 ORDER_DETAILS

Column Name	Data Type	Description
DETAIL_ID	VARCHAR(32)	Foreign key to the PAGE_DETAILS table.
SESSION_ID	VARCHAR(29)	Foreign key to the SESSION_DETAILS table.
VISIT_ID	VARCHAR(32)	Foreign key to the VISIT_DETAILS table.
PRODUCT_SKU	VARCHAR(100)	Product SKU.
PRODUCT_NM	VARCHAR(130)	Product name defined during configuration.
PRODUCT_ID	VARCHAR(130)	Unique identifier defined in SAS Customer Intelligence 360 during configuration.

QUANTITY_AMT	INT	Number of units in the shopping cart.
AVAILABILITY_MESSAGE_TEXT	VARCHAR(650)	Availability message that is displayed. Examples of availability messages are “In Stock” and “Back Ordered.”
UNIT_PRICE_AMT	DECIMAL(17,2)	Price per unit.
CURRENCY_CD	VARCHAR(6)	Currency (such as USD) that is displayed with the product.
SHIPPING_MESSAGE_TXT	VARCHAR(650)	Shipping message that is displayed. An example of a shipping message is “Ships within five business days.”
SAVING_MESSAGE_TXT	VARCHAR(650)	Savings message that is displayed. An example of a savings message is “Buy One Get One Half Price!”
PRODUCT_GROUP_NM	VARCHAR(130)	Product group name. This value can be derived from a product name or a lookup table, based on ID or SKU.
RECORD_TYPE	VARCHAR(15)	Has value of “order”, which means that the data was collected from an order confirmation page and an actual purchase has occurred.
IDENTITY_ID	VARCHAR(36)	Alphanumeric number that represents a customer.
LOAD_DTTM	TIMESTAMP	Internal UTC datetime stamp of when the record was loaded.

Table A2.66 *ORDER_SUMMARY*

Column Name	Data Type	Description
DETAIL_ID	VARCHAR(32)	Foreign key to the PAGE_DETAILS table.
SESSION_ID	VARCHAR(29)	Foreign key to the SESSION_DETAILS table.
VISIT_ID	VARCHAR(32)	Foreign key to the VISIT_DETAILS table.

RECORD_TYPE	VARCHAR(15)	Has values of “checkout” and “order”. If the value of this column is “checkout”, then the data in this record was collected from the check-out page and indicates an intent to purchase (but not a completed purchase) by the visitor. If the value of this column is “order”, then the data was collected from an order confirmation page, and an actual purchase has occurred.
SHIPPING_COUNTRY_NM	VARCHAR(85)	Shipping country name.
SHIPPING_POSTAL_CD	VARCHAR(10)	Shipping country ZIP code.
BILLING_CITY_NM	VARCHAR(390)	Billing city name.
BILLING_STATE_REGION_CD	VARCHAR(256)	Billing state name.
SHIPPING_CITY_NM	VARCHAR(390)	Shipping city name.
SHIPPING_STATE_REGION_CD	VARCHAR(256)	Shipping state name.
BILLING_POSTAL_CD	VARCHAR(10	Billing ZIP code.
BILLING_COUNTRY_NM	VARCHAR(85)	Billing country name.
TOTAL_PRICE_AMT	DECIMAL(17,2)	Total price of all items in the shopping cart or order.
TOTAL_TAX_AMT	DECIMAL(17,2)	Amount of tax that is displayed in the cart or order.
CURRENCY_CD	VARCHAR(6)	Currency (such as USD) that is displayed with the product.
SHIPPING_AMT	DECIMAL(17,2)	Shipping cost that is displayed in the cart or order.
DELIVERY_TYPE_DESC	VARCHAR(42)	Delivery type that is selected in the check-out or order.
PAYMENT_TYPE_DESC	VARCHAR(42)	Payment type that is selected in the check-out or order.
CART_ID	VARCHAR(42)	ID of the cart, if available.

ORDER_ID	VARCHAR(42)	Identification of the actual order, as opposed to the cart view or check-out view.
IDENTITY_ID	VARCHAR(36)	Alphanumeric number that represents a customer.
ACTIVITY_DTTM	TIMESTAMP	UTC datetime stamp of when the activity occurred.
ACTIVITY_DTTM_TZ	TIMESTAMP	Datetime stamp of when the activity occurred in the local time zone.
LOAD_DTTM	TIMESTAMP	Internal UTC datetime stamp of when the record was loaded.

Custom Attributes

The CUSTOM_ATTRIBUTES table contains information about attributes that do not fit in any of the predefined subject areas such as goals or transactions.

Table A2.67 *CUSTOM_ATTRIBUTES*

Column Name	Data Type	Description
DETAIL_ID	VARCHAR(32)	Foreign key to the PAGE_DETAILS table.
SESSION_ID	VARCHAR(29)	Foreign key to the SESSION_DETAILS table.
VISIT_ID	VARCHAR(32)	Foreign key to the VISIT_DETAILS table.
ATTRIB_VAL	VARCHAR(650)	Value of the custom attribute.
ATTRIB_NM	VARCHAR(32)	Name of the custom attribute.
IDENTITY_ID	VARCHAR(36)	Alphanumeric number that represents a customer.
ATTRIB_DTTM	TIMESTAMP	UTC datetime stamp of the custom attribute.
ATTRIB_DTTM_TZ	TIMESTAMP	Datetime stamp of the custom attribute in the local time zone.
LOAD_DTTM	TIMESTAMP	Internal UTC datetime stamp of when the record was loaded.

Document Details

The DOCUMENT_DETAILS table provides information about how visitors attempt to download documents from your website. The information in this table is based on the **Document Downloads** configurations that you set in SAS Customer Intelligence 360. For more information, see "Manage Document Download Types" on page 332.

Table A2.68 DOCUMENT_DETAILS

Column Name	Data Type	Description
DETAIL_ID	VARCHAR(32)	Foreign key to the PAGE_DETAILS table.
SESSION_ID	VARCHAR(29)	Foreign key to the SESSION_DETAILS table.
VISIT_ID	VARCHAR(32)	Foreign key to the VISIT_DETAILS table.
LINK_ID	VARCHAR(1332)	HTML object ID of the link tag.
URI_TXT	VARCHAR(1332)	URI link of the document.
LINK_NAME	VARCHAR(1332)	HTML object name of the link tag.
LINK_SELECTOR_PATH_TXT	VARCHAR(1332)	Exact location, which includes the path of the element that was clicked within the page.
ALT_TXT	VARCHAR(1332)	Alternate text of the link to a document. If the link includes text, then that text is used for this value. If the link does not include text, then the alternate text in the HTML code is used, if available.
IDENTITY_ID	VARCHAR(36)	Alphanumeric number that represents a customer.
LINK_EVENT_DTTM	TIMESTAMP	UTC datetime stamp of when the document was accessed.
LINK_EVENT_DTTM_TZ	TIMESTAMP	Datetime stamp of when the document was accessed in the local time zone.
LOAD_DTTM	TIMESTAMP	Internal UTC datetime stamp of when the record was loaded.

Page Errors

The PAGE_ERRORS table provides information about the type of JavaScript errors or application-level errors that a visitor experiences on your website. JavaScript errors are automatically added.

Table A2.69 PAGE_ERRORS

Column Name	Data Type	Description
DETAIL_ID	VARCHAR(32)	Foreign key to the PAGE_DETAILS table.
SESSION_ID	VARCHAR(29)	Foreign key to the SESSION_DETAILS table.
VISIT_ID	VARCHAR(32)	Foreign key to the VISIT_DETAILS table.
IN_PAGE_ERROR_TXT	VARCHAR(260)	Error text, as retrieved from the web browser, in the language of the web browser.
ERROR_LOCATION_TXT	VARCHAR(41)	Additional information about the error. For example, this value might be the line number of a JavaScript error if the web browser provides this information. If no additional text is available, the value of this column is either a space or “N/A”.
IDENTITY_ID	VARCHAR(36)	Alphanumeric number that represents a customer.
IN_PAGE_ERROR_DTTM	TIMESTAMP	UTC datetime stamp of when the error occurred.
IN_PAGE_ERROR_DTTM_TZ	TIMESTAMP	Datetime stamp of when the error occurred in the local time zone.
LOAD_DTTM	TIMESTAMP	Internal UTC datetime stamp of when the record was loaded.

Form Details

The FORM_DETAILS table provides information about how visitors interact with the forms on your website to enter information. For example, you can use this table to monitor the number of fields that a visitor completes in a form. You can also use this information to understand how long visitors take to enter data in the form fields.

By analyzing visitor behavior and visitor interactions with the forms on your website, you can determine whether there are specific barriers that deter visitors from completing a form. You can use this information to troubleshoot and improve the effectiveness of your forms.

This table is based on the configurations that you define in SAS Customer Intelligence 360. For more information, see "Form" on page 336.

Table A2.70 *FORM_DETAILS*

Column Name	Data Type	Description
DETAIL_ID	VARCHAR(32)	Foreign key to the PAGE_DETAILS table.
SESSION_ID	VARCHAR(29)	Foreign key to the SESSION_DETAILS table.
VISIT_ID	VARCHAR(32)	Foreign key to the VISIT_DETAILS table.
FORM_NM	VARCHAR(65)	Form name, as configured while defining the rules. The form name for searches is the search name that is configured while defining the rules.
FORM_FIELD_NM	VARCHAR(325)	Name of a field in the form, as collected from the website.
FORM_FIELD_ID	VARCHAR(325)	ID of a field in the form, as collected from the website.

ATTEMPT_STATUS_CD	VARCHAR(42)	Status of the current attempt when the field changed or the form is submitted. Each value is preceded by an order or hierarchy number. Possible values are as follows: 0_Not Submitted: The visitor is interacting with the form, filling in fields, or has recently loaded the form page. 1_Submitted Pending Outcome: The visitor clicked Submit or pressed Enter, but the form has not yet posted. For example, a form might need to change or be fixed, so a message box is displayed instead of a posted form. 2_Submitted Pending Outcome: The form has been submitted and the posted form values have been acquired. However, the outcome of the form submission is still unknown. 3_Submitted Unsuccessfully: The form was submitted but was not successful. 3_Submitted Successfully: The form was submitted and the visitor was directed to a **Success** page. 3_Submitted Unsuccessfully and 3_Submitted Successfully are mutually exclusive and therefore have the same hierarchical value.
ATTEMPT_INDEX_CNT	INT	Number of the attempt to complete a form. For example, a visitor's third attempt to complete and submit a form is assigned an attempt number value of `3`.
FORM_FIELD_VALUE	VARCHAR(2600)	Value entered in the form field. This value might be encrypted, depending on your configuration for how to collect form values.

CHANGE_INDEX_NO	INT	Number of times that the field value was changed from its original value within the current attempt. A value of `0` indicates that the visitor did not change the form field within the current attempt. A value of `1` or more indicates that the user changed the form field value one or more times in the given attempt. FORM_FIELD_VALUE is always the value after the last change.
SUBMIT_FLG	CHAR(1)	Flag that indicates whether the visitor attempted to submit the form. A value of `0` indicates that the information in this record is not from a form submission but from interacting with the form. A value of `1` indicates that the information in this record is from a form submission.
IDENTITY_ID	VARCHAR(36)	Alphanumeric number that represents a customer.
FORM_FIELD_DETAIL_DTTM	TIMESTAMP	UTC datetime stamp of when the user interacted with the form field.
FORM_FIELD_DETAIL_DTTM_TZ	TIMESTAMP	Datetime stamp of when the user interacted with the form field in the local time zone.
LOAD_DTTM	TIMESTAMP	Internal UTC datetime stamp of when the record was loaded.

Goal Details

The GOAL_DETAILS table provides information about the goals visitors achieve when accessing your website. *Goals* are events that are relevant to your business. These goals are events that you want to analyze or report on, but they are not defined in different subject areas such as product views, purchases, or business processes.

In SAS Customer Intelligence 360, various goals that you would like visitors to your website to reach are predefined. Typically, these goals represent important steps in a visitor's interaction with the website. For example, a goal might be registration for a newsletter or using a mortgage calculator.

You can also use goals to track conversions. For example, you can define a goal called *Conversion*. This goal could combine all conversion events and be used for calculating a standardized conversion rate.

Table A2.71 GOAL_DETAILS

Column Name	Data Type	Description
DETAIL_ID	VARCHAR(32)	Foreign key to the PAGE_DETAILS table.
SESSION_ID	VARCHAR(29)	Foreign key to the SESSION_DETAILS table.
VISIT_ID	VARCHAR(32)	Foreign key to the VISIT_DETAILS table.
GOAL_NM	VARCHAR(260)	Goal name.
GOAL_GROUP_NM	VARCHAR(130)	Goal group name.
GOAL_REVENUE_AMT	DECIMAL(17,2)	Revenue amount that is associated with the goal.
IDENTITY_ID	VARCHAR(36)	Alphanumeric number that represents a customer.
GOAL_REACHED_DTTM	TIMESTAMP	UTC datetime stamp of when the goal was reached.
GOAL_REACHED_DTTM_TZ	TIMESTAMP	Datetime stamp of when the goal was reached in the local time zone.
LOAD_DTTM	TIMESTAMP	Internal UTC datetime stamp of when the record was loaded.

Identity

The IDENTITY table lists the current identities. This is the full list of active identities in the system.

Table A2.72 IDENTITY

Column Name	Data Type	Description
IDENTITY_ID	VARCHAR(36)	Alphanumeric number that represents a customer.

The IDENTITY_ATTRIBUTES table contains one record per IDENTITY_ID per identifier type, with the exception of VISITOR_ID. This table contains individual columns for each of the identity types (for example, email, login ID, and subject ID). Customers might find it useful to transpose rows to columns so that there is one record per identity. The IDENTITY_ATTRIBUTES table contains the individual identifier values according to the definition of attributes. When joining other tables that contain IDENTITY_ID with this table, customers might need to use left joins to obtain only matching content, as this table only contains records with known identifiers (as opposed to containing all identities).

Table A2.73 IDENTITY_ATTRIBUTES

Column Name	Data Type	Description
IDENTIFIER_TYPE_ID	VARCHAR(36)	Type of identity (for example, email, login ID, and subject ID). Usually linked with source.
USER_IDENTIFIER_VAL	VARCHAR(5000)	Identifier value, commonly referred to as the channel user ID. The value of this column is immutable.
IDENTITY_ID	VARCHAR(36)	Alphanumeric number that represents a customer.
ENTRYTIME	TIMESTAMP	UTC datetime stamp mapped or merged in the SAS Customer Intelligence 360 identity service.
LOAD_DTTM	TIMESTAMP	Internal UTC datetime stamp of when the record was loaded.

The IDENTITY_MAP table references the current identity ID with historical identity IDs (for example, the source-to-target mappings). This table contains the self-reference if the identity has not been merged. The TARGET_IDENTITY_ID is the most current identity ID. This simplifies joins for users because there is no need to remember doing a left join and using a coalesce. Users can join every table with the IDENTITY_MAP table and get the TARGET_IDENTITY_ID, showing them which identity or customer the data belongs to. When joining other tables that contain IDENTITY_ID with this table, however, customers might need to use left joins to obtain current or merged identities for a given identity, as this table contains records only if an identity was ever merged.

Table A2.74 IDENTITY_MAP

Column Name	Data Type	Description
SOURCE_IDENTITY_ID	VARCHAR(36)	Original identity ID that the channel user ID is associated with for the event.
TARGET_IDENTITY_ID	VARCHAR(36)	Current identity ID of the channel user based on various associations or merging along the path.
ENTRYTIME	TIMESTAMP	UTC datetime stamp mapped or merged in the SAS Customer Intelligence 360 identity service.

LOAD_DTTM	TIMESTAMP	Internal UTC datetime stamp of when the record was loaded.

Media Details

The MEDIA_DETAILS table provides information about the types of video or media objects that are available on your website and how visitors interact with these components. All media interactions are automatically collected and provided in this table. No specific configurations are required other than specifying a name for the media objects instead of the URL.

Table A2.75 *MEDIA_DETAILS*

Column Name	Data Type	Description
DETAIL_ID	VARCHAR(32)	Foreign key to the PAGE_DETAILS table.
SESSION_ID	VARCHAR(29)	Foreign key to the SESSION_DETAILS table.
VISIT_ID	VARCHAR(32)	Foreign key to the VISIT_DETAILS table.
MEDIA_URI_TXT	VARCHAR(2024)	URL of the media object.
MEDIA_DURATION_SECS	DECIMAL(11,3)	Length, in seconds, of the media clip. This information is sometimes not available.
MEDIA_PLAYER_VERSION_TXT	VARCHAR(20)	Media player version.
MEDIA_PLAYER_NM	VARCHAR(30)	Media player name.
MEDIA_NM	VARCHAR(260)	Name of the media object.
IDENTITY_ID	VARCHAR(36)	Alphanumeric number that represents a customer.
PLAY_START_DTTM	TIMESTAMP	UTC datetime stamp of when the visitor began playing the media object.
PLAY_START_DTTM_TZ	TIMESTAMP	Datetime stamp of when the visitor began playing the media object in the local time zone.
LOAD_DTTM	TIMESTAMP	Internal UTC datetime stamp of when the record was loaded.

The MEDIA_DETAILS_EXT table provides summarized information about how visitors interact with video or media objects on your website. Every record in this table describes a continuous piece of content that a visitor viewed.

Each media object that a visitor interacts with can have zero or more records in this table. If a specific media object does not have a record in this table, then a visitor clicked on the object but did not watch any of the content. For example, the video might not have loaded or the visitor might have continued to a new page while the media player was still loading or buffering. If a visitor watches a video segment more than once, this table still contains only one record for the media object.

Here are a few examples of how a visitor's interactions with a media object are reflected in this table:

- A visitor watches the full five minutes of a video non-stop. This table contains one record where START_TM = `0` and END_TM = `5:00`.
- A visitor watches the first minute of a five-minute video and then skips to the last minute.

  This table contains the following two records:

  - one record where START_TM = `000:00` and END_TM = `1:00`
  - one record where START_TM = `4:00` and END_TM = `5:00`
- A visitor watches the full five minutes of a video, returns to the 45-second mark, and watches the video to the end again.

  This table contains one record where START_TM = `0` and END_TM = `5:00`.

For information about supported media types, see "Collecting Data from Media" on page 349.

The data for EXIT_POINT_SECS, INTERACTION_CNT, MAX_PLAY_SECS, MEDIA_DISPLAY_DURATION_SECS, PLAY_END_DTTM, and VIEW_DURATION_SECS is updated on a delayed schedule, after the information becomes available. Records that are missing this information have been loaded recently and are updated later when the data is available.

Table A2.76 MEDIA_DETAILS_EXT

Column Name	Data Type	Description
DETAIL_ID	VARCHAR(32)	Foreign key to the PAGE_DETAILS table.
MEDIA_URI_TXT	VARCHAR(2024)	URL of the media object.
START_TM	DECIMAL(11,3)	Start time, in seconds, of a continuous segment of video that a visitor watches.
MEDIA_NM	VARCHAR(260)	Name of the media object.

MEDIA_DISPLAY_DURATION_SECS	DECIMAL(11,3)	Total amount of unique video content that the visitor consumes. The value of this column is based on the amount of video content that a visitor watches, not the amount of time a visitor spends watching the video. For example, if a visitor watches the same 10 seconds of a given video three times, then the value of this column is 10 seconds.
INTERACTION_CNT	INT	Number of total interactions (for example, stops, pauses, rewinds, or skips) or status updates that the visitor performed with the media object while viewing it.
EXIT_POINT_SECS	DECIMAL(11,3)	Playhead time of the video when a visitor stopped viewing the video.
MAX_PLAY_SECS	DECIMAL(11,3)	Maximum playhead time of the video that a visitor reached over the course of viewing the media object. This value reflects the latest point in a video that the media player plays the video. For example, if a viewer fast forwards a video to minute five (00:05:00) and watches only 10 seconds, then the value of this column is 00:05:10.
VIEW_DURATION_SECS	DECIMAL(11,3)	Total time that a visitor spent viewing the media object.
END_TM	DECIMAL(11,3)	End time, in seconds, of a continuous segment of video that a visitor watches.
PLAY_END_DTTM	TIMESTAMP	UTC datetime stamp of when the visitor stopped playing the media object.
PLAY_END_DTTM_TZ	TIMESTAMP	Datetime stamp of when the visitor stopped playing the media object in the local time zone.
LOAD_DTTM	TIMESTAMP	Internal UTC datetime stamp of when the record was loaded.

Product Views

The PRODUCT_VIEWS table provides information about what products visitors view. It is based on the products that you select in the **Cart** configurations defined in SAS Customer Intelligence 360. For more information, see "Cart" on page 335.

Table A2.77 PRODUCT_VIEWS

Column Name	Data Type	Description
DETAIL_ID	VARCHAR(32)	Foreign key to the PAGE_DETAILS table.
SESSION_ID	VARCHAR(29)	Foreign key to the SESSION_DETAILS table.
VISIT_ID	VARCHAR(32)	Foreign key to the VISIT_DETAILS table.
PRODUCT_NM	VARCHAR(130)	Product name defined during configuration.
PRODUCT_ID	VARCHAR(130)	Unique identifier defined in SAS Customer Intelligence 360 during configuration.
PRODUCT_SKU	VARCHAR(100)	Unit for keeping stock.
SHIPPING_MESSAGE_TXT	VARCHAR(650)	Shipping message that is displayed. An example of a shipping message is "Ships within five business days."
AVAILABILITY_MESSAGE_TXT	VARCHAR(650)	Availability message that is displayed. Examples of availability messages are "In Stock" and "Back Ordered."
PRODUCT_GROUP_NM	VARCHAR(130)	Product group name derived from a product name or a lookup table, based on ID or SKU.
SAVING_MESSAGE_TXT	VARCHAR(650)	Savings message that is displayed. An example of a savings message is "Buy One Get One Half Price!"
PRICE_VAL	DECIMAL(17,2)	Price of the product.
CURRENCY_CD	VARCHAR(6)	Currency (such as USD) that is displayed with the product.
IDENTITY_ID	VARCHAR(36)	Alphanumeric number that represents a customer.

ACTION_DTTM	TIMESTAMP	UTC datetime stamp of when the product was viewed.
ACTION_DTTM_TZ	TIMESTAMP	Datetime stamp of when the product was viewed in the local time zone.
LOAD_DTTM	TIMESTAMP	Internal UTC datetime stamp of when the record was loaded.

Promotions

The PROMOTION_DISPLAYED and PROMOTION_USED tables provide information about the promotions that are displayed on your website and visitor interactions with these promotions.

A *promotion* is a banner, link, or advertisement on your website that is used to direct visitor traffic to a specific page or task on your website. For example, a promotion might link a visitor to a product page, a page that provides a sales offer, or a visitor registration survey. Therefore, a visitor can see and click multiple promotions during a single session and can click a single promotion more than once.

SAS Customer Intelligence 360 enables you to track each of these promotions and which ones were displayed and which were clicked. Promotions, both those displayed and those that are clicked, are defined in the Data Collection settings configuration in SAS Customer Intelligence 360.

Note: A personalized offer made by SAS Real-Time Decision Manager, or any other personalization solution, is considered a promotion.

The information in these tables is based on the **Promotions** configurations that you defined in SAS Customer Intelligence 360. For more information, see "Promotion" on page 342.

Table A2.78 PROMOTION_DISPLAYED

Column Name	Data Type	Description
DETAIL_ID	VARCHAR(32)	Foreign key to the PAGE_DETAILS table.
SESSION_ID	VARCHAR(29)	Foreign key to the SESSION_DETAILS table.
VISIT_ID	VARCHAR(32)	Foreign key to the VISIT_DETAILS table.

PROMOTION_NUMBER	INT	Sequence number of the promotion, as defined in the configuration rules. The value of this column is used together with sessions to link records in the PROMOTION_DISPLAYED table to records in the PROMOTION_USED table.
DERIVED_DISPLAY_FLG	CHAR(1)	Flag that indicates whether the display that is associated with the promotion is synthetically derived from the PROMOTION_USED table, rather than being a true display. If the display of a promotion cannot be determined or is not configured, then SAS Customer Intelligence 360 creates derived display records and sets this flag accordingly. DISPLAY_DTTM in the PROMOTION_DISPLAYED table and CLICK_DTTM in the PROMOTION_USED table are identical.
PROMOTION_TYPE_NM	VARCHAR(65)	Type of promotion.
PROMOTION_TRACKING_CD	VARCHAR(65)	Tracking code that enables you to identify the promotion.
PROMOTION_NM	VARCHAR(260)	Name of the promotion defined during configuration.
PROMOTION_CREATIVE_NM	VARCHAR(260)	Description of the image or theme that is used by a given promotion defined in SAS Customer Intelligence 360.
PROMOTION_PLACEMENT_NM	VARCHAR(260)	Page or website location of the promotion defined in SAS Customer Intelligence 360.
IDENTITY_ID	VARCHAR(36)	Alphanumeric number that represents a customer.

DISPLAY_DTTM	TIMESTAMP	UTC datetime stamp of when the promotion was displayed. When the DERIVED_DISPLAY_FLG value is 1, the DISPLAY_DTTM value is the same as CLICK_DTTM in the PROMOTION_USED table.
DISPLAY_DTTM_TZ	TIMESTAMP	Datetime stamp of when the promotion was displayed. When the DERIVED_DISPLAY_FLG value is 1, the DISPLAY_DTTM value is the same as CLICK_DTTM in the PROMOTION_USED table in the local time zone.
LOAD_DTTM	TIMESTAMP	Internal UTC datetime stamp of when the record was loaded.

Table A2.79 *PROMOTION_USED*

Column Name	Data Type	Description
DETAIL_ID	VARCHAR(32)	Foreign key to the PAGE_DETAILS table.
SESSION_ID	VARCHAR(29)	Foreign key to the SESSION_DETAILS table.
VISIT_ID	VARCHAR(32)	Foreign key to the VISIT_DETAILS table.
PROMOTION_NUMBER	INT	Sequence number of the promotion, as defined in the configuration rules.
PROMOTION_TYPE_NM	VARCHAR(65)	Type of promotion.
PROMOTION_TRACKING_CD	VARCHAR(65)	Tracking code that enables you to identify the promotion.
PROMOTION_NM	VARCHAR(260)	Name of the promotion defined during configuration.
PROMOTION_CREATIVE_NM	VARCHAR(260)	Description of the image or theme that is used by a given promotion defined in SAS Customer Intelligence 360.

PROMOTION_PLACEMENT_NM	VARCHAR(260)	Page or website location of the promotion defined in SAS Customer Intelligence 360.
IDENTITY_ID	VARCHAR(36)	Alphanumeric number that represents a customer.
CLICK_DTTM	TIMESTAMP	UTC datetime stamp of when the promotion was clicked.
CLICK_DTTM_TZ	TIMESTAMP	Datetime stamp of when the promotion was clicked in the local time zone.
LOAD_DTTM	TIMESTAMP	Internal UTC datetime stamp of when the record was loaded.

Search Results

The SEARCH_RESULTS table provides information about how visitors use the search feature on your website and how effective their search results are.

Table A2.80 *SEARCH_RESULTS*

Column Name	Data Type	Description
DETAIL_ID	VARCHAR(32)	Foreign key to the PAGE_DETAILS table.
SESSION_ID	VARCHAR(29)	Foreign key to the SESSION_DETAILS table.
VISIT_ID	VARCHAR(32)	Foreign key to the VISIT_DETAILS table.
SEARCH_NM	VARCHAR(42)	Search name that is configured in SAS Customer Intelligence 360.
RESULTS_DISPLAYED_FLG	CHAR(1)	Flag that, when SEARCH_RESULTS_DISPLAYED is `0`, indicates whether the number of search results could not be determined (`0`) or the search returns results (`1`).
SEARCH_RESULTS_DISPLAYED	INT	Number of search results that were displayed for a query.

SRCH_PHRASE	VARCHAR(2600)	Value entered in the search field. The value of this column is the actual search phrase that a user uses to search for something.
SRCH_FIELD_NAME	VARCHAR(325)	Name of a field in the search form, as collected from the website.
SRCH_FIELD_ID	VARCHAR(325)	ID of a field in the search form, as collected from the website.
IDENTITY_ID	VARCHAR(36)	Alphanumeric number that represents a customer.
SEARCH_RESULTS_DTTM	TIMESTAMP	UTC datetime stamp of when the search was submitted.
SEARCH_RESULTS_DTTM_TZ	TIMESTAMP	Datetime stamp of when the search was submitted in the local time zone.
LOAD_DTTM	TIMESTAMP	Internal UTC datetime stamp of when the record was loaded.

Business Process Details

The BUSINESS_PROCESS_DETAILS table provides information about business processes. It is based on the **Business process** configurations that you set in SAS Customer Intelligence 360. For more information, see “Business Process” on page 334.

A *business process* is a sequence of steps that a visitor to the website must follow, resulting in a significant action or change of state. Business processes typically involve a visitor choosing various options and selections to complete complex tasks.

Purchasing insurance can be considered a business process. For example, a visitor who is purchasing insurance online might need to enter personal details such as automobile information, accident records, bank details, and so on.

Table A2.81 *BUSINESS_PROCESS_DETAILS*

Column Name	Data Type	Description
DETAIL_ID	VARCHAR(32)	Foreign key to the PAGE_DETAILS table.
SESSION_ID	VARCHAR(29)	Foreign key to the SESSION_DETAILS table.
VISIT_ID	VARCHAR(32)	Foreign key to the VISIT_DETAILS table.

NEXT_DETAIL_ID	VARCHAR(32)	Foreign key to the PAGE_DETAILS table. This value represents the next page that a visitor views after the business process step.
PROCESS_STEP_NM	VARCHAR(130)	Name of the step, as defined during configuration.
STEP_ORDER_NO	INT	Order of the steps within the business process.
PROCESS_INSTANCE_NO	INT	Number of times that a business process is attempted in a session. The first instance shows a value of `0`. The second instance shows a value of `1`, and so on. A visitor might go through the same business process more than once within a single session. If the visitor leaves halfway through the business process and later returns to step 1, this action might not necessarily mean that the visitor started a new instance. It might be considered a continuation of the previous instance of the business process that was not completed. A new business process occurs in these instances: business process has not already started. business process has already started, but a step is flagged as a termination point or the previous business process completed successfully. nonlinear business process reaches a step that is flagged as the first step. This occurs regardless of whether the previous business process has completed.
PROCESS_NM	VARCHAR(130)	Business process name that is defined in the Business process configuration.

ATTRIBUTE1_TXT	VARCHAR(130)	First business process attributed. You can define this attribute in SAS Customer Intelligence 360. You can use these attributes to classify or segment the completed business processes. For example, if you have a 10-step process for a credit card application, you might define a business process attribute such as Card Type to segment applications by gold card and platinum card. In this case, the steps of the application (or business process) are the same. However, one application might be assigned to the gold card segment and another might be assigned to the platinum card segment. Categorizing the business process data by attribute enables you to view the business process data from different perspectives and make comparisons in your analysis.
ATTRIBUTE2_TXT	VARCHAR(130)	Second business process attribute. For more information, see the description for ATTRIBUTE1_TXT.
IS_COMPLETION_FLG	CHAR(1)	Flag that indicates whether the current step successfully completes the business process as defined.
PROCESS_ATTEMPT_CNT	INT	Sequence number, starting with 1, that indicates how often a given step was attempted within the entire process.
IS_START_FLG	CHAR(1)	Flag that indicates whether the step was the first one of the business process.
PROCESS_EXCEPTION_TXT	VARCHAR(1300)	Description of the error or error message that occurred, as defined during configuration.
IDENTITY_ID	VARCHAR(36)	Alphanumeric number that represents a customer.

PROCESS_DTTM	TIMESTAMP	UTC datetime stamp of when the step in the business process occurred.
PROCESS_DTTM_TZ	TIMESTAMP	Datetime stamp of when the step in the business process occurred in the local time zone.
PROCESS_EXCEPTION_DTTM	TIMESTAMP	UTC datetime stamp of when the error occurred.
PROCESS_EXCEPTION_DTTM_TZ	TIMESTAMP	Datetime stamp of when the error occurred in the local time zone.
LOAD_DTTM	TIMESTAMP	Internal UTC datetime stamp of when the record was loaded.

Discover Base Table Mart Tables and Columns

The Discover base tables are used to create the predefined reports that are available from the home page for SAS Customer Intelligence 360. For more information, seeChapter 57, “Discover Insights,” on page 771.

The tables are downloaded from the SAS Customer Intelligence 360 Download API. Only completed sessions are available for download. For more information, see “Downloading Data from SAS Customer Intelligence 360” on page 870.

DBT_ADV_CAMPAIGN_VISITORS

This table provides the following data:

- historical details about how visitors are reaching across three dimensions: visits, organic visits, and paid visits
- detailed correlations from a large set of quantitative metrics
- standard metrics for the site such as visits, pages viewed, visit duration, new visitors compared to returning visitors, conversion rate, and so on
- information about the geographical distribution of visitors and the conversion rate by location
- information about the different web browsers and versions that visitors use to access the site
- information about the different devices and platforms that visitors use to access the site

- the number of sessions per month as used in the product licensing in order to understand whether and when the licensed volume is reached
- details about traffic sources such as Paid Search, Organic Search, and Direct
- a detailed view of the Traffic Source section with a focus on the traffic that comes from paid or unpaid sources from search engines
- a detailed view of the Traffic Source section with a focus on the traffic that comes from paid or unpaid sources from social media sites
- information about different landing pages and their effectiveness in creating revenue and conversions as compared to the bounce rate

Table A2.82 *DBT_ADV_CAMPAIGN_VISITORS*

Column Name	Data Type	Description
SESSION_ID	VARCHAR(29)	Session identifier.
SESSION_COMPLETE_LOAD_DTTM	TIMESTAMP	Internal UTC load datetime stamp of the batch in which the session was completed.
VISIT_ID	VARCHAR(32)	Visit identifier.
VISITOR_TYPE	VARCHAR(10)	Indicates the difference between the types of visitor. Valid entries are either New or Returning.
VISITOR_ID	VARCHAR(32)	Unique visitor tracking cookie ID that is retrieved from SAS Customer Intelligence 360.
BOUNCER	VARCHAR(12)	Possible values for this column are “Bouncer” or “Non-Bouncer.”
CU_CUSTOMER_ID	VARCHAR(36)	Alphanumeric ID assigned in SAS Customer Intelligence 360 that represents a customer at a given time.
DEVICE_NAME	VARCHAR(85)	Name of the device from which the session was created (for example, iPad, Kindle, or PS3). The value of this column is always `PC` if the DEVICE_TYPE_NM value in the table is PC.
DEVICE_TYPE	VARCHAR(52)	Type of device that triggers the session (for example, set_top_box or pc).
VISIT_ORIGINATION_CREATIVE	VARCHAR(260)	Name of creative material within an origination.

VISIT_ORIGINATION_NAME	VARCHAR(260)	Origination name.
VISIT_ORIGINATION_PLACEMENT	VARCHAR(390)	Name of ad placement within an origination.
VISIT_ORIGINATION_TRACKING_CODE	VARCHAR(65)	Tracking code that identifies the origination.
VISIT_ORIGINATION_TYPE	VARCHAR(65)	Origination type (for example, direct, organic search, self-referral, organic, referrer, campaign, or social).
AVERAGE_VISIT_DURATION	INT(11)	Average length of time, in seconds, that a visitor stayed on the site viewing one or more pages.
BOUNCERS	INT(11)	Flag that indicates a bouncer (`1`) or otherwise (`0`).
BR_BROWSER_NAME	VARCHAR(52)	Name of the web browser (for example, Firefox or Google Chrome).
BR_BROWSER_VERSION	VARCHAR(16)	Version number of the web browser.
CO_CONVERSIONS	INT(11)	Total number of visitors who have performed an administrator-defined task that results in conversion recognition. A conversion can be converting a visitor to a customer or any other administrator-defined behavior. By default, a conversion is the achievement of at least one defined goal during the visit.
GE_CITY	VARCHAR(390)	City.
GE_COUNTRY	VARCHAR(85)	Country.
GE_LATITUDE	DECIMAL(13,6)	Latitude coordinate.
GE_LONGITUDE	DECIMAL(13,6)	Longitude coordinate.
GE_STATE_REGION	VARCHAR(2)	State.
LANDING_PAGE	VARCHAR(1332)	Number of times this page was the first page seen in a visit.
LANDING_PAGE_URL	VARCHAR(1332)	URL of the page that is available as a starting point for a visitor session.

NEW_VISITORS	INT(11)	Number of first-time visitors to the specific digital domain or domains within the defined date range. A new visitor has an assigned ID (cookie or other identification) that has not been tracked by the data to date.
PAGE_VIEWS	INT(11)	Aggregate number of times that any page is accessed, counted across all site visitors within the specified date range.
PL_DEVICE_OPERATING_SYSTEM	VARCHAR(78)	Operating system of the client's device used for visiting the website.
RETURN_VISITORS	INT(11)	Flag that indicates whether a visitor is returning (1) or new (0).
RV_REVENUE	DECIMAL(17,2)	The actual revenue captured from purchases, as defined in SAS Customer Experience Targeting. Supported formats for the reports are USD and euros.
SE_EXTERNAL_SEARCH_ENGINE	VARCHAR(130)	Search engine name.
SE_EXTERNAL_SEARCH_ENGINE_DOMAIN	VARCHAR(215)	Search engine domain (for example, www.google.com.au or www.google.com.hk).
SE_EXTERNAL_SEARCH_ENGINE_PHRASE	VARCHAR(1332)	Search phrase used during the search.
VISIT_DTTM	TIMESTAMP	UTC datetime stamp of when the re-entry and continuation of the session occurred.
VISIT_DTTM_TZ	TIMESTAMP	Datetime stamp of when the re-entry and continuation of the session occurred in the local time zone.

VISITS	INT(11)	Total number of times that the specific digital domain or domains have been accessed within the defined date range, with respect to any applied filters. If the same page or resource is viewed more than once in a given visit, then it is counted as a single visit with multiple views.
SESSION_START_DTTM	TIMESTAMP	UTC datetime stamp of when the session started.
SESSION_START_DTTM_TZ	TIMESTAMP	Datetime stamp of when the session started in the local time zone.

DBT_CONTENT

This table provides the following information:

- an overview of the most-visited URLs, the time visitors spend on these URLs, and how often these URLs are either the first or last URL within a visit
- details about the top entry and exit pages

Table A2.83 *DBT_CONTENT*

Column Name	Data Type	Description
SESSION_ID	VARCHAR(29)	Foreign key.
SESSION_COMPLETE_LOAD_DTTM	TIMESTAMP	Internal UTC load datetime stamp of the batch in which the session was completed.
VISIT_ID	VARCHAR(32)	Foreign key.
VISITOR_TYPE	VARCHAR(10)	Indicates the difference between the types of visitor. Valid entries are either New or Returning.
VISITOR_ID	VARCHAR(32)	Unique visitor tracking cookie ID that is retrieved from SAS Customer Intelligence 360.
BOUNCER	VARCHAR(12)	Possible values for this column are “Bouncer” or “Non-Bouncer.”

CU_CUSTOMER_ID	VARCHAR(36)	Alphanumeric ID assigned in SAS Customer Intelligence 360 that represents a customer at a given time.
DEVICE_NAME	VARCHAR(85)	Name of the device from which the session was created (for example, iPad, Kindle, or PS3). The value of this column is always `PC` if the DEVICE_TYPE_NM value in the table is PC.
DEVICE_TYPE	VARCHAR(52)	Type of device that triggers the session (for example, set_top_box or pc).
VISIT_ORIGINATION_CREATIVE	VARCHAR(260)	Name of creative material within an origination.
VISIT_ORIGINATION_NAME	VARCHAR(260)	Origination name.
VISIT_ORIGINATION_PLACEMENT	VARCHAR(390)	Name of ad placement within an origination.
VISIT_ORIGINATION_TRACKING_CODE	VARCHAR(65)	Tracking code that identifies the origination.
VISIT_ORIGINATION_TYPE	VARCHAR(65)	Origination type (for example, direct, organic search, self-referral, organic, referrer, campaign, or social).
ACTIVE_PAGE_VIEW_TIME	INT(11)	The value of this column is equal to ACTIVE_SEC_SPENT_IN_SESSN_CNT in the SESSION_DETAILS_EXT table.
DETAIL_DTTM	TIMESTAMP	UTC datetime stamp of when the page view occurred.
DETAIL_DTTM_TZ	TIMESTAMP	Datetime stamp of when the page view occurred in the local time zone.
ENTRY_PAGES	INT(11)	Number of times this page was the first page seen in a visit. This page is also called the landing page.

EXIT_PAGES	INT(11)	Number of times this page was the last page seen in a visit. This page is also called the exit page. The value of this column is set to `1` for the last page in a visit. Otherwise, the value of this column is `0`.
PG_DOMAIN_NAME	VARCHAR(215)	Domain name. This is the portion of the URL between :// and /. It is an identification string that defines a website. For example, www.sas.com and support.sas.com are valid values.
PG_PAGE	VARCHAR(1332)	Page title.
PG_PAGE_URL	VARCHAR(1332)	Unique URL that identifies a page.
VIEWS	INT(11)	Total number of times that an indicated resource is accessed by a site visitor within the specified date range.
CLASS1_ID	VARCHAR(650)	First classification of pages that are defined by the second alias definition in the Page category configuration. Use this classification to define the main sections of the website that you want to include in the customer activities.
CLASS2_ID	VARCHAR(650)	Second classification of pages that are defined by the third alias definition in the Page category configuration.
VISITS	INT(11)	Total number of times that the specific digital domain or domains have been accessed within the defined date range, with respect to any applied filters. If the same page or resource is viewed more than once in a given visit, then it is counted as a single visit with multiple views.
BOUNCERS	INT(11)	Flag that indicates a bouncer (`1`) or otherwise (`0`).

TOTAL_PAGE_VIEW_TIME	BIGINT(20)	Total number of seconds that visitors are actively using or viewing the page.
SESSION_START_DTTM	TIMESTAMP	UTC datetime stamp of when the session started.
SESSION_START_DTTM_TZ	TIMESTAMP	Datetime stamp of when the session started in the local time zone.

DBT_MEDIA_CONSUMPTION

This table provides insight about media consumption activities such as types of media viewed, how much content is viewed, and which content is most frequently viewed.

Table A2.84 *DBT_MEDIA_CONSUMPTION*

Column Name	Data Type	Description
SESSION_ID	VARCHAR(29)	Foreign key.
SESSION_COMPLETE_LOAD_DTTM	TIMESTAMP	Internal UTC load datetime stamp of the batch in which the session was completed.
VISIT_ID	VARCHAR(32)	Foreign key.
VISITOR_TYPE	VARCHAR(10)	Indicates the difference between the types of visitor. Valid entries are either New or Returning.
VISITOR_ID	VARCHAR(32)	Unique visitor tracking cookie ID that is retrieved from SAS Customer Intelligence 360.
BOUNCER	VARCHAR(12)	Possible values for this column are “Bouncer” or “Non-Bouncer.”
CU_CUSTOMER_ID	VARCHAR(36)	Alphanumeric ID assigned in SAS Customer Intelligence 360 that represents a customer at a given time.

DEVICE_NAME	VARCHAR(85)	Name of the device from which the session was created (for example, iPad, Kindle, or PS3). The value of this column is always `PC` if the DEVICE_TYPE_NM value in the table is PC.
DEVICE_TYPE	VARCHAR(52)	Type of device that triggers the session (for example, set_top_box or pc).
VISIT_ORIGINATION_CREATIVE	VARCHAR(260)	Name of creative material within an origination.
VISIT_ORIGINATION_NAME	VARCHAR(260)	Origination name.
VISIT_ORIGINATION_PLACEMENT	VARCHAR(390)	Name of ad placement within an origination.
VISIT_ORIGINATION_TRACKING_CODE	VARCHAR(65)	Tracking code that identifies the origination.
VISIT_ORIGINATION_TYPE	VARCHAR(65)	Origination type (for example, direct, organic search, self-referral, organic, referrer, campaign, or social).
CONTENT_VIEWED	DECIMAL(11,3)	Total amount of unique video content that a visitor consumes. The value of this column is based on the amount of video content that a visitor watches, not the amount of time that is spent watching it. For example, if a visitor watches the same 10 seconds of a given video three times, then the value of this column is 10 seconds.
DETAIL_ID	VARCHAR(32)	Foreign key.
DURATION	DECIMAL(11,3)	Length of time for an indicated media source.
INTERACTIONS_COUNT	INT(11)	Number of total interactions (for example, stops, pauses, rewinds, or skips) or status updates that the visitor performed with the media object while viewing it.

MAXIMUM_PROGRESS	DECIMAL(11,3)	Maximum playhead time of the video that a visitor reached over the course of viewing the media object. This value reflects the latest point in a video that the media player plays the video. For example, if a viewer fast forwards a video to minute five (00:05:00) and watches only 10 seconds, then the value of this column is 00:05:10.
MEDIA_COMPLETION_RATE	VARCHAR(35)	Proportion of media sources that are viewed from beginning to end.
MEDIA_NAME	VARCHAR(260)	This column is the same as the media-level record column.
MEDIA_SECTION	VARCHAR(35)	This column contains value ranges such as 00.00.50 to 00.01:00. The values in this column correspond to a MEDIA_DETAILS record that includes a second between 50 and 60. In an example where the MEDIA_DETAILS record had a viewing from 50 to 70 seconds, a second record would be generated with a value such as 00.01.00 to 00.01:10.
MEDIA_SECTION_VIEW	TINYINT(4)	The value of this column is always 1.
MEDIA_START_DTTM	TIMESTAMP	UTC datetime stamp of when the visitor began playing the media object.
MEDIA_START_DTTM_TZ	TIMESTAMP	Datetime stamp of when the visitor began playing the media object in the local time zone.
TIME_VIEWING	DECIMAL(11,3)	Total time that a visitor spent viewing the media object.
VIEWS	TINYINT(4)	Contains a flag of “1” that indicates a view for a media object.

VIEWS_COMPLETED	TINYINT(4)	The value of this column is `1` if the visitor views 10% or more of the total duration of the video. Otherwise, the value of this column is `0`. The value of this column is also `0` when the duration of the video is 0.
VIEWS_STARTED	TINYINT(4)	The value of this column is always `1`.
MEDIA_URI_TXT	VARCHAR(2024)	URL of the media object.
COUNTER	INT(11)	Counter of the number of media sections. For example, if a media has three sections (0-10, 10-20, and 20-30), then the counter for each record would be 0, 10, and 20.
SESSION_START_DTTM	TIMESTAMP	UTC datetime stamp of when the session started.
SESSION_START_DTTM_TZ	TIMESTAMP	Datetime stamp of when the session started in the local time zone.

DBT_ECOMMERCE

This table provides the following data:

- information about the e-commerce side of your website by showing the number of page views, baskets created, purchases, and revenue made
- information about the effectiveness of advertising and marketing campaigns for e-commerce
- a detailed view into the products that are shown and sold on your site

Table A2.85 *DBT_ECOMMERCE*

Column Name	Data Type	Description
SESSION_ID	VARCHAR(29)	Foreign key.
SESSION_COMPLETE_LOAD_DTTM	TIMESTAMP	Internal UTC load datetime stamp of the batch in which the session was completed.
VISIT_ID	VARCHAR(32)	Foreign key.

VISITOR_TYPE	VARCHAR(10)	Indicates the difference between the types of visitor. Valid entries are either New or Returning.
VISITOR_ID	VARCHAR(32)	Unique visitor tracking cookie ID that is retrieved from SAS Customer Intelligence 360.
BOUNCER	VARCHAR(12)	Possible values for this column are “Bouncer” or “Non-Bouncer.”
CU_CUSTOMER_ID	VARCHAR(36)	Alphanumeric ID assigned in SAS Customer Intelligence 360 that represents a customer at a given time.
DEVICE_NAME	VARCHAR(85)	Name of the device from which the session was created (for example, iPad, Kindle, or PS3). The value of this column is always `PC` if the DEVICE_TYPE_NM value in the table is PC.
DEVICE_TYPE	VARCHAR(52)	Type of device that triggers the session (for example, set_top_box or pc).
VISIT_ORIGINATION_CREATIVE	VARCHAR(260)	Name of creative material within an origination.
VISIT_ORIGINATION_NAME	VARCHAR(260)	Origination name.
VISIT_ORIGINATION_PLACEMENT	VARCHAR(390)	Name of ad placement within an origination.
VISIT_ORIGINATION_TRACKING_CODE	VARCHAR(65)	Tracking code that identifies the origination.
VISIT_ORIGINATION_TYPE	VARCHAR(65)	Origination type (for example, direct, organic search, self-referral, organic, referrer, campaign, or social).
BASKET_ADDS	INT(11)	The value of this column is `1` if this product was added to a basket (including events when some or all products are subsequently removed or are added back to the basket).

BASKET_ADDS_REVENUE	DECIMAL(17,2)	The value of this column represents the total potential revenue sum for this product added to a basket (including events when some or all products are subsequently removed or are added back to the basket).
BASKET_ADDS_UNITS	INT(11)	The value of this column represents the total count of units of this product added to a basket (including events when some or all products are subsequently removed or are added back to the basket).
BASKET_ID	VARCHAR(42)	The value of this column represents the unique value of the current basket.
BASKET_REMOVES	INT(11)	The value of this column is 1 if this product was removed from a basket (even if not all units are removed).
BASKET_REMOVES_REVENUE	DECIMAL(17,2)	The value of this column represents the total potential revenue sum for this product removed from a basket (even if not all units are removed).
BASKET_REMOVES_UNITS	INT(11)	The value of this column represents the total count of units of this product removed from a basket (even if not all units are removed).
BASKETS_ABANDONED	SMALLINT(6)	The value of this column is 1 if a basket was started but not completed during the visit.
BASKETS_COMPLETED	SMALLINT(6)	The value of this column is 1 if a basket was completed during the visit.
BASKETS_STARTED	SMALLINT(6)	Total number of online shopping carts that visitors started with at least one product added to the basket.
PRODUCT_ACTIVITY_DTTM	TIMESTAMP	UTC datetime stamp of when the product was viewed.
PRODUCT_ACTIVITY_DTTM_TZ	TIMESTAMP	Datetime stamp of when the product was viewed in the local time zone.

PRODUCT_GROUP_NAME	VARCHAR(130)	Product group name. This value can be derived from a product name or a lookup table, based on ID or SKU.
PRODUCT_NAME	VARCHAR(130)	Product name defined during configuration.
PRODUCT_PURCHASE_REVENUES	DECIMAL(17,2)	The value of this column represents the total revenue for purchases of this product during the visit.
PRODUCT_PURCHASE_UNITS	INT(11)	The value of this column represents the count of purchase units for this product during the visit.
PRODUCT_PURCHASES	INT(11)	The value of this column is 1 if there were any purchases of this product during the visit.
PRODUCT_SKU	VARCHAR(100)	Product SKU.
PRODUCT_VIEWS	INT(11)	The value of this column represents the count of page views of the product page for this product in the visit.
PRODUCT_ID	VARCHAR(130)	Unique identifier defined in SAS Customer Intelligence 360 during configuration.
SESSION_START_DTTM	TIMESTAMP	UTC datetime stamp of when the session started.
SESSION_START_DTTM_TZ	TIMESTAMP	Datetime stamp of when the session started in the local time zone.

DBT_BUSINESS_PROCESS

This table provides an overview of the success and abandonment rates of the various business processes or funnels that are defined for the site. “NULL” is shown for the BUSINESS_PROCESS_ATTRIBUTE_1 and BUSINESS_PROCESS_ATTRIBUTE_2 columns even though they might have been set up when defining a business process. The detail data provides the correct attributes.

Table A2.86 *DBT_BUSINESS_PROCESS*

Column Name	Data Type	Description

SESSION_ID	VARCHAR(29)	Foreign key.
SESSION_COMPLETE_LOAD_DTTM	TIMESTAMP	Internal UTC load datetime stamp of the batch in which the session was completed.
VISIT_ID	VARCHAR(32)	Foreign key.
VISITOR_TYPE	VARCHAR(10)	Indicates the difference between the types of visitor. Valid entries are either New or Returning.
VISITOR_ID	VARCHAR(32)	Unique visitor tracking cookie ID that is retrieved from SAS Customer Intelligence 360.
BOUNCER	VARCHAR(12)	Possible values for this column are “Bouncer” or “Non-Bouncer.”
CU_CUSTOMER_ID	VARCHAR(36)	Alphanumeric ID assigned in SAS Customer Intelligence 360 that represents a customer at a given time.
DEVICE_NAME	VARCHAR(85)	Name of the device from which the session was created (for example, iPad, Kindle, or PS3). The value of this column is always `PC` if the DEVICE_TYPE_NM value in the table is PC.
DEVICE_TYPE	VARCHAR(52)	Type of device that triggers the session (for example, set_top_box or pc).
VISIT_ORIGINATION_CREATIVE	VARCHAR(260)	Name of creative material within an origination.
VISIT_ORIGINATION_NAME	VARCHAR(260)	Origination name.
VISIT_ORIGINATION_PLACEMENT	VARCHAR(390)	Name of ad placement within an origination.
VISIT_ORIGINATION_TRACKING_CODE	VARCHAR(65)	Tracking code that identifies the origination.
VISIT_ORIGINATION_TYPE	VARCHAR(65)	Origination type (for example, direct, organic search, self-referral, organic, referrer, campaign, or social).

BUS_PROCESS_STARTED_DTTM	TIMESTAMP	UTC datetime stamp of when the first step in the business process occurred.
BUS_PROCESS_STARTED_DTTM_TZ	TIMESTAMP	Datetime stamp of when the first step in the business process occurred in the local time zone.
BUSINESS_PROCESS_ATTRIBUTE_1	VARCHAR(130)	First business process attribute. Always shown as “NULL”. This attribute can be defined in SAS Customer Intelligence 360. You can use attributes to classify or segment completed business processes. For example, if you have a 10-step process for a credit card application, you might define a business process attribute such as Card Type to segment applications by gold card and platinum card. In this case, the steps of the application (or business process) are the same. However, one application might be assigned to the gold card segment and another might be assigned to the platinum card segment. Categorizing business process data by attribute enables you to view the business process data from different perspectives and make comparisons in your analysis.
BUSINESS_PROCESS_ATTRIBUTE_2	VARCHAR(130)	Second business process attribute. Always shown as “NULL”. For more information, see the description for BUSINESS_PROCESS_ATTRIBUTE_1.
BUSINESS_PROCESS_NAME	VARCHAR(130)	Business process name that is defined in the Business Process configuration.
BUSINESS_PROCESS_STEP_NAME	VARCHAR(130)	Name of the step, as defined during configuration.
LAST_STEP	SMALLINT(6)	The value of this column is 1 for the step that was the latest in the process instance, by datetime.
PROCESSES	SMALLINT(6)	The value of this column is 1 for the first step in each business process instance.

PROCESSES_ABANDONED	SMALLINT(6)	The value of this column is 1 if this instance was abandoned (IS_COMPLETION_FLG=0).
PROCESSES_COMPLETED	SMALLINT(6)	Indicates a completed business process in any of the steps.
STEP_COUNT	SMALLINT(6)	Value represents the number of times a step was executed in the process instance.
STEPS	SMALLINT(6)	The value of this column is always 1.
STEPS_ABANDONED	SMALLINT(6)	Number of times visitors did not proceed to the next step.
STEPS_COMPLETED	SMALLINT(6)	The value of this column is 1 if this instance was completed.
SESSION_START_DTTM	TIMESTAMP	UTC datetime stamp of when the session started.
SESSION_START_DTTM_TZ	TIMESTAMP	Datetime stamp of when the session started in the local time zone.

DBT_GOALS

This table provides an overview of the goals that are defined and their achievement levels, both in terms of numbers and revenue assigned to them.

Table A2.87 DBT_GOALS

Column Name	Data Type	Description
SESSION_ID	VARCHAR(29)	Foreign key.
SESSION_COMPLETE_LOAD_DTTM	TIMESTAMP	Internal UTC load datetime stamp of the batch in which the session was completed.
VISIT_ID	VARCHAR(32)	Foreign key.
VISITOR_TYPE	VARCHAR(10)	Indicates the difference between the types of visitor. Valid entries are either New or Returning.

VISITOR_ID	VARCHAR(32)	Unique visitor tracking cookie ID that is retrieved from SAS Customer Intelligence 360.
BOUNCER	VARCHAR(12)	Possible values for this column are “Bouncer” or “Non-Bouncer.”
CU_CUSTOMER_ID	VARCHAR(36)	Alphanumeric ID assigned in SAS Customer Intelligence 360 that represents a customer at a given time.
DEVICE_NAME	VARCHAR(85)	Name of the device from which the session was created (for example, iPad, Kindle, or PS3). The value of this column is always `PC` if the DEVICE_TYPE_NM value in the table is PC.
DEVICE_TYPE	VARCHAR(52)	Type of device that triggers the session (for example, set_top_box or pc).
VISIT_ORIGINATION_CREATIVE	VARCHAR(260)	Name of creative material within an origination.
VISIT_ORIGINATION_NAME	VARCHAR(260)	Origination name.
VISIT_ORIGINATION_PLACEMENT	VARCHAR(390)	Name of ad placement within an origination.
VISIT_ORIGINATION_TRACKING_CODE	VARCHAR(65)	Tracking code that identifies the origination.
VISIT_ORIGINATION_TYPE	VARCHAR(65)	Origination type (for example, direct, organic search, self-referral, organic, referrer, campaign, or social).
GOAL_GROUP_NAME	VARCHAR(130)	Goal group name.
GOAL_NAME	VARCHAR(260)	Goal name.
GOAL_REACHED_DTTM	TIMESTAMP	UTC datetime stamp of when the goal was reached.
GOAL_REACHED_DTTM_TZ	TIMESTAMP	Datetime stamp of when the goal was reached in the local time zone.
GOAL_REVENUE	DECIMAL(17,2)	Amount of revenue associated with the goal.

GOALS	TINYINT(4)	User-defined, administrator-configured behaviors of interest on the website. This includes, but is not limited to, any behavior that is seen as a conversion.
VISITS	INT(11)	Value of this column is always 1.
SESSION_START_DTTM	TIMESTAMP	UTC datetime stamp of when the session started.
SESSION_START_DTTM_TZ	TIMESTAMP	Datetime stamp of when the session started in the local time zone.

DBT_FORMS

This table provides the following information:

- details about visitor interactions with forms
- the fields that visitors interacted with most recently just before abandoning a form

Table A2.88 DBT_FORMS

Column Name	Data Type	Description
SESSION_ID	VARCHAR(29)	Foreign key.
SESSION_COMPLETE_LOAD_DTTM	TIMESTAMP	Internal UTC load datetime stamp of the batch in which the session was completed.
VISIT_ID	VARCHAR(32)	Foreign key.
VISITOR_TYPE	VARCHAR(10)	Indicates the difference between the types of visitor. Valid entries are either New or Returning.
VISITOR_ID	VARCHAR(32)	Unique visitor tracking cookie ID that is retrieved from SAS Customer Intelligence 360.
BOUNCER	VARCHAR(12)	Possible values for this column are “Bouncer” or “Non-Bouncer.”

CU_CUSTOMER_ID	VARCHAR(36)	Alphanumeric ID assigned in SAS Customer Intelligence 360 that represents a customer at a given time.
DEVICE_NAME	VARCHAR(85)	Name of the device from which the session was created (for example, iPad, Kindle, or PS3). The value of this column is always `PC` if the DEVICE_TYPE_NM value in the table is PC.
DEVICE_TYPE	VARCHAR(52)	Type of device that triggers the session (for example, set_top_box or pc).
VISIT_ORIGINATION_CREATIVE	VARCHAR(260)	Name of creative material within an origination.
VISIT_ORIGINATION_NAME	VARCHAR(260)	Origination name.
VISIT_ORIGINATION_PLACEMENT	VARCHAR(390)	Name of ad placement within an origination.
VISIT_ORIGINATION_TRACKING_CODE	VARCHAR(65)	Tracking code that identifies the origination.
VISIT_ORIGINATION_TYPE	VARCHAR(65)	Origination type (for example, direct, organic search, self-referral, organic, referrer, campaign, or social).
ATTEMPTS	INT(11)	The value of this column represents a count of the number of attempts to submit, even if the submissions are unsuccessful.
FORM_ATTEMPT_DTTM	TIMESTAMP	UTC datetime stamp of when the user interacted with the form field.
FORM_ATTEMPT_DTTM_TZ	TIMESTAMP	Datetime stamp of when the user interacted with the form field in the local time zone.
FORM_NM	VARCHAR(65)	The value of this column represents the unique name of the current form.
FORMS_COMPLETED	SMALLINT(6)	The value of this column is `1` when a successful form submission is completed.

FORMS_NOT_SUBMITTED	SMALLINT(6)	The value of this column is set to 1 when a form submission has not been attempted.
FORMS_STARTED	SMALLINT(6)	The value of this column is always 1.
LAST_FIELD	VARCHAR(325)	The value of this column represents the name of the last form field in the data for this form attempt.
SESSION_START_DTTM	TIMESTAMP	UTC datetime stamp of when the session started.
SESSION_START_DTTM_TZ	TIMESTAMP	Datetime stamp of when the session started in the local time zone.

DBT_PROMOTIONS

This table provides information about the click-through rates of site promotions. These promotions can be internal advertising offers or third-party advertising.

Table A2.89 DBT_PROMOTIONS

Column Name	Data Type	Description
SESSION_ID	VARCHAR(29)	Foreign key.
SESSION_COMPLETE_LOAD_DTTM	TIMESTAMP	Internal UTC load datetime stamp of the batch in which the session was completed.
VISIT_ID	VARCHAR(32)	Foreign key.
VISITOR_TYPE	VARCHAR(10)	Indicates the difference between the types of visitor. Valid entries are either New or Returning.
VISITOR_ID	VARCHAR(32)	Unique visitor tracking cookie ID that is retrieved from SAS Customer Intelligence 360.
BOUNCER	VARCHAR(12)	Possible values for this column are “Bouncer” or “Non-Bouncer.”

CU_CUSTOMER_ID	VARCHAR(36)	Alphanumeric ID assigned in SAS Customer Intelligence 360 that represents a customer at a given time.
DEVICE_NAME	VARCHAR(85)	Name of the device from which the session was created (for example, iPad, Kindle, or PS3). The value of this column is always `PC` if the DEVICE_TYPE_NM value in the table is PC.
DEVICE_TYPE	VARCHAR(52)	Type of device that triggers the session (for example, set_top_box or pc).
VISIT_ORIGINATION_CREATIVE	VARCHAR(260)	Name of creative material within an origination.
VISIT_ORIGINATION_NAME	VARCHAR(260)	Origination name.
VISIT_ORIGINATION_PLACEMENT	VARCHAR(390)	Name of ad placement within an origination.
VISIT_ORIGINATION_TRACKING_CODE	VARCHAR(65)	Tracking code that identifies the origination.
VISIT_ORIGINATION_TYPE	VARCHAR(65)	Origination type (for example, direct, organic search, self-referral, organic, referrer, campaign, or social).
CLICK_THROUGHS	INT(11)	Click-throughs are also known as conversions. This column is a count of the number of promotion-used records for a session and a promotion.
DISPLAYS	INT(11)	Number of promotion-display records for a session and a promotion. The value of this column is always `1`.
PROMOTION_CREATIVE	VARCHAR(260)	Description of the image or theme that is used by a given promotion defined in SAS Customer Intelligence 360.
PROMOTION_NAME	VARCHAR(260)	Name of the promotion defined during configuration.
PROMOTION_PLACEMENT	VARCHAR(260)	Page or website location of the promotion defined in SAS Customer Intelligence 360.

PROMOTION_SHOWN_DTTM	TIMESTAMP	UTC datetime stamp of when the promotion was displayed.
PROMOTION_SHOWN_DTTM_TZ	TIMESTAMP	Datetime stamp of when the promotion was displayed in the local time zone.
PROMOTION_TRACKING_CODE	VARCHAR(65)	Tracking code that enables you to identify the promotion.
PROMOTION_TYPE	VARCHAR(65)	Type of promotion.
SESSION_START_DTTM	TIMESTAMP	UTC datetime stamp of when the session started.
SESSION_START_DTTM_TZ	TIMESTAMP	Datetime stamp of when the session started in the local time zone.

DBT_DOCUMENTS

This table lists the most accessed and downloaded documents on your site.

Table A2.90 *DBT_DOCUMENTS*

Column Name	Data Type	Description
SESSION_ID	VARCHAR(29)	Foreign key.
SESSION_COMPLETE_LOAD_DTTM	TIMESTAMP	Internal UTC load datetime stamp of the batch in which the session was completed.
VISIT_ID	VARCHAR(32)	Foreign key.
VISITOR_TYPE	VARCHAR(10)	Indicates the difference between the types of visitor. Valid entries are either New or Returning.
VISITOR_ID	VARCHAR(32)	Unique visitor tracking cookie ID that is retrieved from SAS Customer Intelligence 360.
BOUNCER	VARCHAR(12)	Possible values for this column are “Bouncer” or “Non-Bouncer.”

CU_CUSTOMER_ID	VARCHAR(36)	Alphanumeric ID assigned in SAS Customer Intelligence 360 that represents a customer at a given time.
DEVICE_NAME	VARCHAR(85)	Name of the device from which the session was created (for example, iPad, Kindle, or PS3). The value of this column is always `PC` if the DEVICE_TYPE_NM value in the table is PC.
DEVICE_TYPE	VARCHAR(52)	Type of device that triggers the session (for example, set_top_box or pc).
VISIT_ORIGINATION_CREATIVE	VARCHAR(260)	Name of creative material within an origination.
VISIT_ORIGINATION_NAME	VARCHAR(260)	Origination name.
VISIT_ORIGINATION_PLACEMENT	VARCHAR(390)	Name of ad placement within an origination.
VISIT_ORIGINATION_TRACKING_CODE	VARCHAR(65)	Tracking code that identifies the origination.
VISIT_ORIGINATION_TYPE	VARCHAR(65)	Origination type (for example, direct, organic search, self-referral, organic, referrer, campaign, or social).
DO_PAGE_DESCRIPTION	VARCHAR(1332)	Alternate text of the link to a document. If the link includes text, then that text is used as the alternate text value. If the link does not include text, then the alternate text in the HTML code is used, if available.
DO_PAGE_URL	VARCHAR(1332)	URI link of the document.
DOCUMENT_DOWNLOAD_DTTM	TIMESTAMP	UTC datetime stamp of when the document was downloaded.
DOCUMENT_DOWNLOAD_DTTM_TZ	TIMESTAMP	Datetime stamp of when the document was downloaded in the local time zone.
DOCUMENT_DOWNLOADS	INT(11)	The value of this column is always `1`.

CLASS1_ID	VARCHAR(650)	First classification of pages that are defined by the second alias definition in the Page category configuration. Use this classification to define the main sections of the website that you want to include in the customer activities.
CLASS2_ID	VARCHAR(650)	Second classification of pages that are defined by the third alias definition in the Page category configuration.
SESSION_START_DTTM	TIMESTAMP	UTC datetime stamp of when the session started.
SESSION_START_DTTM_TZ	TIMESTAMP	Datetime stamp of when the session started in the local time zone.

DBT_SEARCH

This table provides the following data:

- information that enables you to understand the use and effectiveness of the site's internal search function
- information about searches that did not return results or searches for which the system was not able to determine whether there were results

Table A2.91 *DBT_SEARCH*

Column Name	Data Type	Description
SESSION_ID	VARCHAR(29)	Foreign key.
SESSION_COMPLETE_LOAD_DTTM	TIMESTAMP	Internal UTC load datetime stamp of the batch in which the session was completed.
VISIT_ID	VARCHAR(32)	Foreign key.
VISITOR_TYPE	VARCHAR(10)	Indicates the difference between the types of visitor. Valid entries are either New or Returning.
VISITOR_ID	VARCHAR(32)	Unique visitor tracking cookie ID that is retrieved from SAS Customer Intelligence 360.

BOUNCER	VARCHAR(12)	Possible values for this column are “Bouncer” or “Non-Bouncer.”
CU_CUSTOMER_ID	VARCHAR(36)	Alphanumeric ID assigned in SAS Customer Intelligence 360 that represents a customer at a given time.
DEVICE_NAME	VARCHAR(85)	Name of the device from which the session was created (for example, iPad, Kindle, or PS3). The value of this column is always `PC` if the DEVICE_TYPE_NM value in the table is PC.
DEVICE_TYPE	VARCHAR(52)	Type of device that triggers the session (for example, set_top_box or pc).
VISIT_ORIGINATION_CREATIVE	VARCHAR(260)	Name of creative material within an origination.
VISIT_ORIGINATION_NAME	VARCHAR(260)	Origination name.
VISIT_ORIGINATION_PLACEMENT	VARCHAR(390)	Name of ad placement within an origination.
VISIT_ORIGINATION_TRACKING_CODE	VARCHAR(65)	Tracking code that identifies the origination.
VISIT_ORIGINATION_TYPE	VARCHAR(65)	Origination type (for example, direct, organic search, self-referral, organic, referrer, campaign, or social).
EXIT_PAGES	INT(11)	The value of this column is set to `1` for the last page in a visit. Otherwise, the value of this column is `0`.
INTERNAL_SEARCH_TERM	VARCHAR(128)	Value entered in the search field. The value of this column is the actual search phrase that a user uses for the search.
NUM_ADDITIONAL_SEARCHES	INT(11)	Number of additional searches after the current search.
NUM_PAGES_VIEWED_AFTERWARD	INT(11)	Number of pages viewed after the current search.

SEARCH_NAME	VARCHAR(42)	Search name that is configured in SAS Customer Intelligence 360. This column originates from the SEARCH_RESULTS table.
SEARCH_RESULTS_DTTM	TIMESTAMP	UTC datetime stamp of when the search was submitted.
SEARCH_RESULTS_DTTM_TZ	TIMESTAMP	Datetime stamp of when the search was submitted in the local time zone.
SEARCH_NO_RESULTS_RETURNED	INT(11)	Flag (1 or 0) indicating that the search did not return any results.
SEARCH_RETURNED_RESULTS	INT(11)	Flag (1 or 0) indicating that the search returned results.
SEARCH_UNKNOWN_RESULTS	INT(11)	Flag (1 or 0) indicating that the search returned unknown results.
SEARCHES	INT(11)	The value of this column is always 1.
VISITS	INT(11)	The value of this column is always 1.
SESSION_START_DTTM	TIMESTAMP	UTC datetime stamp of when the session started.
SESSION_START_DTTM_TZ	TIMESTAMP	Datetime stamp of when the session started in the local time zone.