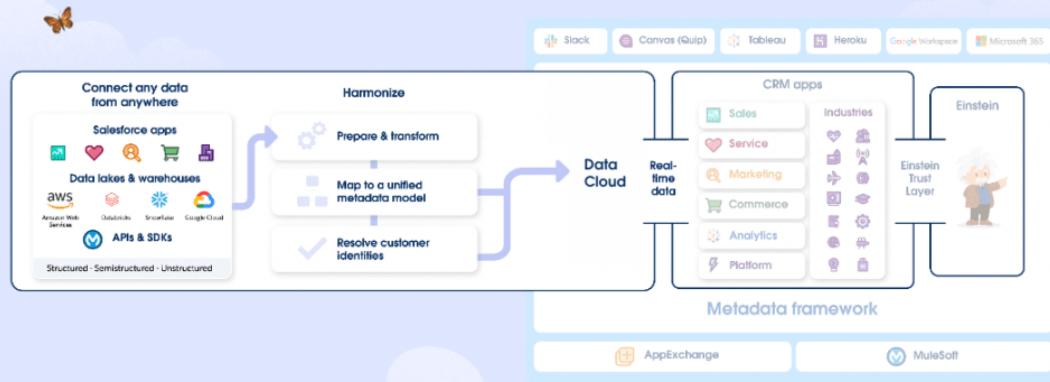


Data Cloud brings all of your data into CRM



By KAPIL BATRA

Darts Cloud DAY 1

Step-1.

Bringing data into data cloud



1. In data ingestion phase we will bring data into data cloud as it is. Without doing any transformation.

How to bring data from external system to Data Cloud?

Step-1 → Established a connection using OOTB connectors available in Salesforce.

Step-2 → Once connector is set up, create Data Streams to get different dataset from the source system.

The data that comes as Data Streams is gathered in a Data Lake object (DLO).

For each data stream there will be a separate DLO.

In DLO data will be stored in tabular formats.
(Data Ingestion)

Step 3 - Data Modeling → In this phase the data stored in data lake objects is mapped to different objects in Customer 360 objects.

The objects in this data model is called Data Model Objects (DMO)

Darts Cloud App Tabs	
Data Stream	Create data streams to get data from external systems.
Data Model	Let you see different data model objects and create relationship between them.
Identity Resolutions	Create matching and reconciliation rules to UNIFY your records.
Data Explorer	View the data that you have ingested and unified so far
Profile Explorer	Same as Data Explorer
Calculated Insights	To create matrix of your data. You can write SOQL to get matrix.
Segment	Filter and group individuals in segments

Data Action

Fire events based on your ingested data or calculated insights.
Can be used to trigger automations to downstreams

Data Cloud DAY 2

How to use ingestion APIs to load data in Data Cloud?

Salesforce has taken up the API first approach while building its products.

Data Cloud offers bunch of different APIs to interact with data and Metadata.

Salesforce offers a postman collection to explore these APIs.

Salesforce Data Cloud APIs : Can be downloaded from salesforce developer workspace in postman.

Ingestion API → Provide a restful interface to load data programmatically in DATA Cloud.

Ingestion APIs

Bulk (CSV)	Streaming (JSON)
Upsert/Delete large data sets	Send micro batches of data.

Note: Once data is ingested data cloud will process the data near real time which is once in 15 min.

Ingestion API

When to use what?

Streaming Ingestion

When updating small micro-batches of records in near real-time.

When using data source systems that are built on modern streaming architectures.

When creating change data capture events.

When consuming data from webhooks.

Bulk Ingestion

When moving large volumes of data on a daily, weekly, or monthly schedule.

When using legacy systems where you can only export data during off-peak hours.

When using a new Data Cloud org that you want to backfill with 30, 60, or 90+ days of data.

salesforce
developers

Setting up ingestion APIs

1. Set up the ingestion API connector
2. Create and deploy data stream
3. Create a connected app.
4. Request for access token and call the API

Notes :

- You can setup different connectors, one for each system that you want to create.
- After that you need to upload a schema that describes shape of the data that you are going to send.
- The Schema is created in yaml format. Schema will contain different event types and the fields as well.

Example :

```

! solar-circles-panel-events.yaml
Users > atopalli > Downloads > ! solar-circles-panel-events.yaml
1 openapi: 3.0.3
2 components:
3   schemas:
4     performance_summary:
5       type: object
6       properties:
7         panel_id:
8           type: string
9           datetime:
10          type: string
11          format: date-time
12          daily_cuf:
13            type: number
14
15     panel_readings:
16       type: object
17       properties:
18         panel_id:
19           type: string
20           datetime:
21             type: string
22             format: date-time
23             voltage:
24             type: number
25             temperature:
26             type: number
27             light_intensity:
28               type: number

```

Ln 2, Col 12 Spaces: 2 UTF-8 LF Y

- While creating data streams you will be getting option to choose the available objects. You can select multiple objects there. For each selected object one data stream will be created.
- For each object you are going to choose you need to specify a category.
 1. Engagement : Objects that captures interaction & events.
 2. Profile : Objects that capture information about a person.
 3. Other : Other categories like Payment inventories etc.
- Each data Stream has its corresponding DLO that is automatically created.
- While creating connected app, in OAuth scope you need to must select cdp ingest api and refresh token.
- In the API call, you need to mention the connector name and the object name.
- In the success response you will receive "accepted" : true that means data cloud has accepted the data and it will be processed in next 15 min.

→ During the development phase we can select sync record validation end point to quickly validate your request. This request doesn't commit any data to objects like test class.

Data Cloud Day-3

Salesforce interaction web SDK

It is an extensible data capture and collection framework having following features.

- Tracking of customer interaction, charts & profile data.
- Identity and cookie management for anonymous and named identity tracking.
- Consent management integration hooks.
- Configuration driven instrumentation with sitemaps.
- Integration hooks for adding custom functionality.

Data Collection

Data Collection

```
SalesforceInteractions.sendEvent({
  interaction : {
    name : "View Catalog Object",
    catalogObject: {
      type : "Product",
      id : "65e4e737",
      attributes: {
        description: "Shoes"
      }
    },
    user: {
      attributes: {
        email: 'user@domain.com'
      }
    }
})
```

Method that sends an interaction event

Engagement data

Profile Data

Above is a code snippet of interaction event and how you can send it to data cloud

User Identity and Cookie management

Anonymous Profiles

```
SalesforceInteractions.getAnonymousId()
// => "efc9953d6515dc7f"
```

Identity of new and returning customers using first-party cookies.

Named/Known Profile

```
user: {
  attributes: {
    email: 'user@domain.com'
  }
}
```

Consent Management

Web SDK doesn't store or transmit data collected until it has been granted consent

```
SalesforceInteractions.init({
  consents: [
    {
      provider: "OneTrust",
      purpose: SalesforceInteractions.ConsentPurpose.Tracking,
      status: SalesforceInteractions.ConsentStatus.OptIn
    }
  ]
})
```

```
SalesforceInteractions.updateConsents({
  purpose: SalesforceInteractions.ConsentPurpose.Tracking,
  provider: "OneTrust",
  status: SalesforceInteractions.ConsentStatus.OptIn
})
```

For consent management you can set the information from init method or whenever user is changing his consent then updateConsents method can be used.

Sitemap

Using sitemap you can do following actions →

1. Access data during page navigation
2. Share data capture logic across multiple pages
3. Separate data capture logic from web page presentation logic.

Example → Share data capture logic across multiple components.

lets say you are having multiple components with buttons and you need to track user's click on it. Now instead of putting same logic to all those button and repeat your code sitemap allows you to share the data capture logic using the **listeners** feature to listen to a particular event i.e a click event and match it with a selector like a class name or any other selected HTML element name and then you can fire the send event API call within the listener.

```
SalesforceInteractions.init().then(() => {
  const global = {
    locale: 'en_US',
    listeners: [
      listener('click', '.example-selector', (event) => {
        console.log(event)
      })
    ],
    onActionEvent: (actionEvent) => {
      console.log(actionEvent)
    }
  }
  SalesforceInteractions.initSitemap({
    global,
    ...
  })
})
```

That way your logic will work around all the components and all the pages instead of you having to modify each component to include the code snippet.

How to set up the Web SDK?

- ① Set up the website and Mobile Apps connector
- ② Create and deploy a data stream.
- ③ Embed the data capture logic in your website.

Data Cloud DAY -4 Mapping Data Streams

What is Data Model Object?

Data Model Objects are like any other object Std or Custom in Salesforce which can be used to map your Data lake objects with DMO.

You can create custom DMO as per your need and you can also add custom fields in the OOTB DMO.

Overall flow of the DATA

Data Streams → Data Lake Objects → Data Model Objects

Data Cloud DAY -5 Data Cloud Permissions

Data Cloud is having below 6 OOTB Permission Sets

Data Cloud Permission Sets

You can combine these Data Cloud permission sets with other Salesforce permission sets for users who need additional access.

Data Cloud Admin—Users with this permission set can access all functionality within Data Cloud, including mapping data to the data model and creating data streams, identity resolution rulesets, and calculated insights.

To manage and assign users in Setup and access Data Cloud Setup, you must be a Data Cloud Admin and have a Salesforce administrator role that grants access to Salesforce Setup. If you have access to Salesforce Setup, you can set up the application, and access Salesforce Sales and Service clouds and other integrated Salesforce systems.

Data Cloud User—Users with this permission set can view Data Cloud features.

Data Cloud for Marketing Permission Sets

Data Cloud for Marketing orgs have the standard Data Cloud permission sets, plus marketing-specific permission sets. You can combine the Data Cloud for Marketing permission sets with other Salesforce permission sets for users who need additional access.

Data Cloud for Marketing Admin—Users with this permission set can manage day-to-day configuration needs, support, maintenance, and improvement and perform regular internal system audits.

To manage and assign users in Setup and access Data Cloud Setup, you must be a Data Cloud Admin and have a Salesforce administrator role that grants access to Salesforce Setup. If you have access to Salesforce Setup, you can set up the application, and access Salesforce Sales and Service clouds and other integrated Salesforce systems.

Data Cloud for Marketing Data Aware Specialist—Users with this permission set can map data to the data model and create data streams, identity resolution rulesets, and calculated insights.

Data Cloud for Marketing Manager—Users with this permission set can manage an overall segmentation strategy, including creating activation targets and activations.

Data Cloud for Marketing Specialist—Users with this permission set can create segments.

Note: You should use these OOTB permission sets and not create custom one because these permission sets will be auto updated with each new release of data cloud.

Data Space :

Data Spaces

A data space is a logical partition to organize your data for profile unification, insights, and marketing in Data Cloud. You can segregate your data, metadata, and processes into categories, such as brand, region, or department, and then enable users to see and work on data only in the context of their category. You can also merge and analyze data in data spaces.

REQUIRED EDITIONS

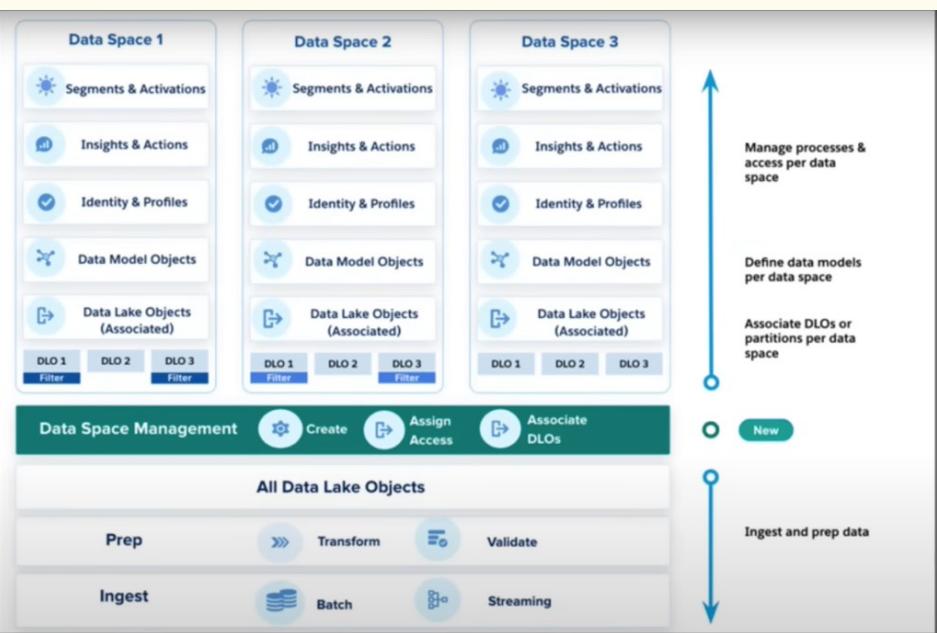
Available in: Lightning Experience

Available with add-on license: **Data Spaces**

When and why to use data spaces?

You are a Data Cloud user and own a business with multiple brands and departments. You're currently using multiple Data Cloud instances to segregate data and for the flexibility of running various brands and departments separately. With the introduction of data spaces in Data Cloud you don't need multiple Data Cloud instances anymore. Data spaces allow you to segregate your data for these brands and departments within a single Data Cloud instance.

Ingest data from any source only once to the Data Cloud, and segregate it in multiple data spaces independently. Your users can now view and work on data only in the context of their data space. Personalize the user experience and manage user access control to designated data spaces through various permission sets.



By default 1 data space will be available in your org. you can create more data space as per your business needs.

User will only be able to see Data Space if its assigned to them.

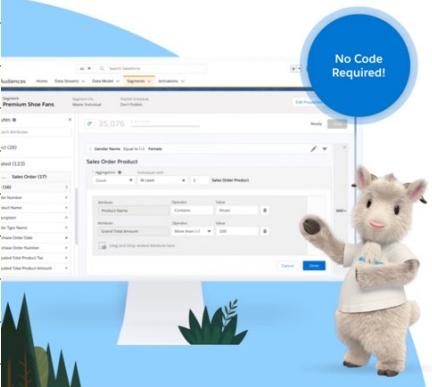
Moreover it's similar to exports in Salesforce.

Data Cloud DAY - 6

Segment and activate your data

Segmentation and Activation

Create high-value segments and activate at scale for increased conversions



All of your Data

Segment data from Marketing, Sales, Service, Commerce, data warehouses and lakes, and any source available

Smarter Data

Leverage integrated Einstein calculated attributes to add modeled data like propensity and lifetime value scores

Immediate Results

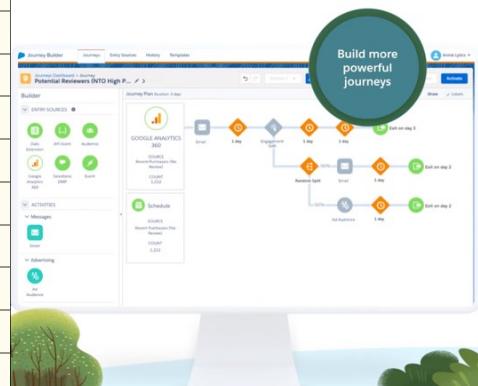
Run unlimited queries and get immediate segment populations, unlocking the ability to test and learn

Activate Anywhere

Activate your data for email, mobile, advertising, web, and personalization across channels and send to external partners

Marketing Activation

Supercharge Marketing Cloud with precision segments to increase conversions



Activate Journeys

Build powerful segments and launch prescriptive journeys with native connectivity to Journey Builder

Improve Email Performance

Go from "batch and blast" to precision email targeting leveraging all of your available data

Master Mobile Messaging

Push Data Cloud data into Marketing Cloud Engagement to align SMS campaigns

Segments will need a Data Space to create it.

New Segment

Audience members who opted in to Restriction of Processing are removed from the population when segmenting on Unified Individual or Individual. Data Protection and Privacy compliance controls for personal data are not enforced when segmenting on any other objects. Tell Me More

Define data space, segment membership and name.

Segment Properties:

- * Data Space: default
- * Segment Name: UnifiedIndividualsInLargeTexasCities
- * Segment On: Unified Individual
- Description:

Cancel Next

New Segment

Once you assign a standard publish, this selection is permanent.

Choose your segment's publish type and schedule.

Publish Type:

- Standard Publish: Use the last 7 years of engagement data in segmentation rules and publish to any activation target.
- Rapid Publish: Use the last 7 days of engagement data in segmentation rules and publish to Marketing Cloud more frequently.

Publish Schedule:

- * Publish Schedule: Select an Option
- Don't refresh
- 12 hours
- 24 hours
- End Date:

Back Save

You can create Activation Targets from Activation Target tab

New Activation Target

Salesforce Apps

LA Danielle Larregui

External Platforms

All (2) Advertising (2) Publishing (0) Analytics (0) Marketing (0) Technology (0)

Google Ads Create activation targets using a connected Google Ads account.

Meta (Facebook) Create activation targets using a connected Meta account.

Others

aws S3

Cancel Next

New Activation Target

Activation Target Name: SolarCircleMarketingCloud

Description:

Marketing Cloud Subscriber Key will be automatically published to a new Data Extension per segment.

Back Next

New Activation Target

Choose which business units to publish your segment to.

Available Business Units: LA Danielle Larregui, 20230103

Selected Business Units: LA Danielle Larregui, 20230103

Next

The selected activation target in the image is Marketing Cloud.

Data Cloud Day -7

Identity Resolution in Data Cloud

Data Cloud

A single source of truth about your customers to power your digital experiences

Ingest, Prepare and Harmonize Data
Ingest, prepare and harmonize customer data from anywhere at any velocity into a business friendly data model



Discover And Act
Calculate new insights in near real-time to deepen understanding and act when important conditions occur

Resolve Identity and Curate Truth
Unify and resolve customer data into a unified profile creating a single source of truth about your customers

Activate Profiles for Personalization
Action your data to personalize every interaction across all channels and touchpoints

Segment and Understand
Categorize customer profiles into rich segments using first, second and third-party data

Explore and Visualize
Explore customer data and engagement across channels and Clouds

Collect Consent Signals
Collect consumer and data-rights and preferences

Similar to duplicate & matching rules in Salesforce to create a unified record.

Data Cloud DAY-8

Creating and Querying Insights

Insights are metrics that are created based on your data. There are two types of insights you can create.

Calculated Insights

What are the differences?

Calculated Insights

Created on high volume bulk data.

Calculated every 6, 12 or 24 hours.

Created on any type of data.

Available for segmentation, activations, enrichments and data actions.

Streaming Insights

Streaming Insights

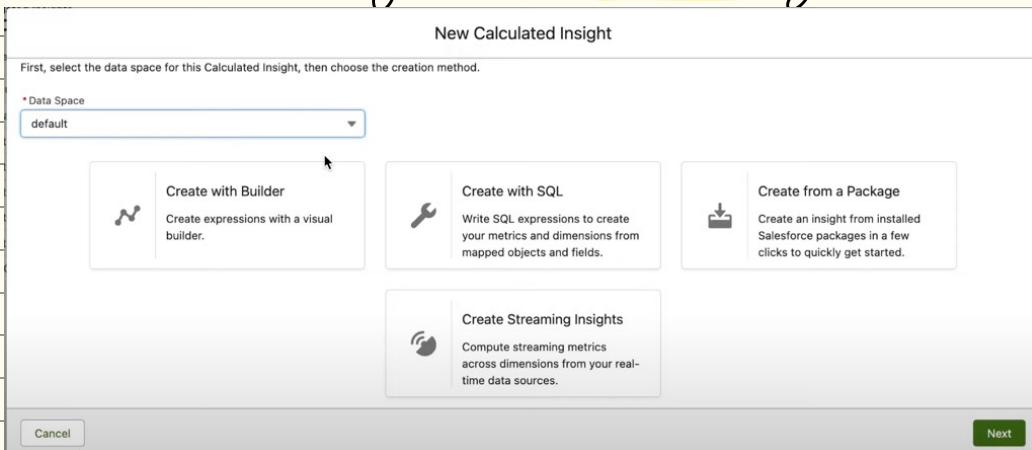
Created on micro-batches of real-time data.

Calculated near real time.

Created only on Engagement data.

Available for Data actions.

Users can create insights from Calculated Insights Tab.



While creating an insights you can use Builder which will give you a flow kind of NO CODE UI where you will be able to drag & drop.
OR you can also choose to go with SQL query.

Note: Even tho if you are using builder option to create the insights, once it is created it will give you the auto generated SQL query as well.

This screenshot shows the 'Expression' tab of the Calculated Insight creation interface. The tab is highlighted with a green underline. Below the tab, the word 'Expression' is bolded. A cursor icon is positioned over the 'Expression' tab.

Expression

```
SELECT SUM(Solar_Panel_performance_summary__dlm.total_power_consumed__c) AS total_power_consumed__c,  
ssot__Individual__dlm.ssot__Id__c AS individual_id__c FROM Solar_Panel_performance_summary__dlm JOIN  
Purchased_Product_00D8Z000001rteH__dlm ON (Solar_Panel_performance_summary__dlm.panel_id__c =  
Purchased_Product_00D8Z000001rteH__dlm.id__c AND Solar_Panel_performance_summary__dlm.KQ_panel_id__c =  
Purchased_Product_00D8Z000001rteH__dlm.KQ_Id__c) JOIN ssot__Individual__dlm ON  
(Purchased_Product_00D8Z000001rteH__dlm.Contact_c__c = ssot__Individual__dlm.ssot__Id__c AND  
Purchased_Product_00D8Z000001rteH__dlm.KQ_Contact_c__c = ssot__Individual__dlm.KQ_Id__c) GROUP BY individual_id__c
```

Each calculated insight is like an Object which will have Fields Name, API, Data Type and Field Type.

The records in it is the metrics that are calculated based on your query.

Again similar to kind of creating or reports using multiple Objects.

Streaming Insights

Creation of it is similar to calculated insights. There are few things you need to take care in your query.

- ① Each streaming insights must have the dimensions window, start and Window.end
 - ② It must also have a window function in the group By clause. The window function defines the time window for aggregation. Time windows can be anything between 1 min to 24 hours.

Data Enrichment

Use Data Cloud Data to Enrich Your Data

Data Cloud enrichments copy or query data from Data Cloud into standard Salesforce components that you can add to specific record pages. You can add related lists and fields with data from Data Cloud to your Contact and Leads record pages.

Where: This change applies to Lightning Experience in Enterprise and Unlimited editions.

Who: Data Cloud admins or Data Cloud for Marketing admins who are also a Salesforce admin with View All (Enrichment) and Modify All (Enrichment) permissions.

How: From the Contact or Lead object management settings, select Data Cloud Copy Fields or Data Cloud Related Lists.

You can also query the insights using Data Cloud API collection.

You can query the data in APEX as well using the ConnectAPI class.

Checkout below example where we are querying top 5 records.

```

taController.cls M X
app > main > default > classes > DataController.cls
@AuraEnabled(cacheable=true)
public static String getPowerConsumptionLeaderboard(){
    List<String> contactIds = new List<String>();

    String ciName = 'Total_Power_Consumption__cio';
    String dimensions = null;
    String measures = null;
    String orderby = 'total_power_consumed__c DESC';
    String filters = null;
    Integer limit = 5;
    Integer offset = null;

    ConnectApi.CdpQueryInput input = new ConnectApi.CdpQueryInput();
    ConnectApi.CdpQueryOutput output = ConnectApi.CdpQuery.queryCalculatedInsights([
        ciName, dimensions, measures, orderby, filters, limit, offset
    ]);
    List<Object> results = output.data;

    for(Object o : results){
        String jsonStr = JSON.serialize(o);
        Map<String, Object> insightAgain = (Map<String, Object>)JSON.deserializeUntyped(jsonStr);
        contactIds.add((String)insightAgain.get('contact_id__c'));
    }
}

```

DATA CLOUD DAY - 9

Using DATA Actions with Flows & Apex

Data Actions are nothing but the events that are sent to predefined targets whenever certain conditions are met.

These targets can then use these event to trigger their own downstream business processes.

Defining a Data Action

1 Where do we send the action?

Targets: Platform Events, Webhooks or Marketing Cloud

2 What object triggers the action?

Triggering Object: DMO or CIO

3 When the action gets triggered?

Event Rules

4 Which records trigger the action?

Action Rules



A platform event target always publish an event called **DataObjectDataChangeEvent**

DataObjectDataChangeEvent
Notifies subscribers of an action within Data Cloud

In the target Salesforce Org you need to subscribe to above event.

Subscribe to DataObjectDataChgEvent

sale:
deve

ActionDeveloperName

Fire_PE_when_Total_Voltage_drops_GT_3

PayloadCurrentValue

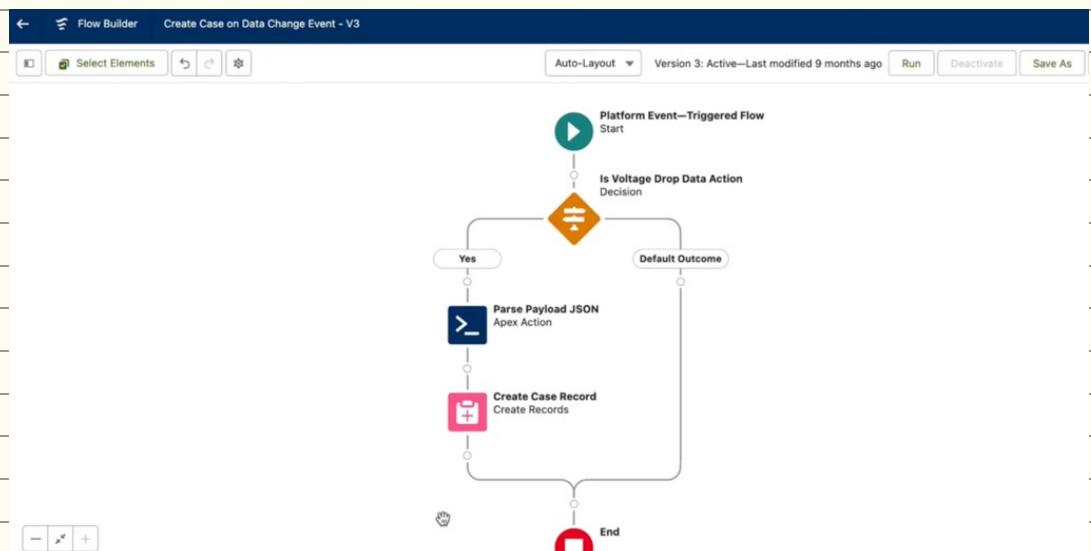
```
{  
    "Voltage_Drops_in_10_mins__cio_window_end__c": "2023-12-05 12:00:00",  
    "Voltage_Drops_in_10_mins__cio_panel_id__c": "0038Z00003QbjzTQAR",  
    "Voltage_Drops_in_10_mins__cio_window_start__c": "2023-12-05 12:10:00",  
    "Voltage_Drops_in_10_mins__cio_total_drops__c": 4  
}
```



Subscribe via Apex:

```
force-app > main > default > triggers > DataActionTrigger.trigger  
trigger DataActionTrigger on DataObjectDataChgEvent (after insert) {  
    List<String> panelIdsForCaseCreation = new List<String>();  
  
    for(DataObjectDataChgEvent dce : trigger.new){  
        // Filter based on the Data Action Name  
        if(dce.ActionDeveloperName == 'Fire PE when Total Voltage drops GT 3'){  
            // Parse the JSON Payload  
            Map<String, Object> actionDataMap = (Map<String, Object>)JSON.deserializeUntyped(dce.PayloadCurrentValue);  
  
            // Get the data you need from the payload  
            String panelId = (String)actionDataMap.get('Voltage_Drops_in_10_mins__cio_panel_id__c');  
            panelIdsForCaseCreation.add(panelId);  
        }  
  
        // Your own business logic  
        List<Case> casesToCreate = new List<Case>();  
        for(String s : panelIdsForCaseCreation){  
            Case c = new Case();  
            c.Subject = 'Voltage Drop in Panel';  
            c.Product__c = panelId;  
            casesToCreate.add(c);  
        }  
  
        insert as user casesToCreate;  
    }  
}
```

Subscribe via Flow



You can also do the same using Data Cloud-Triggered Flow as shown below.

Flow Builder

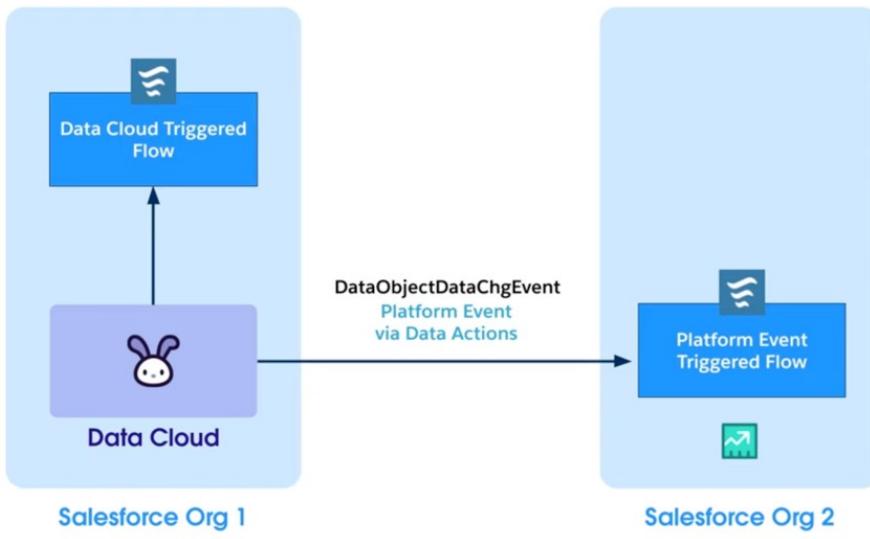
New Flow

Core All + Templates

- Screen Flow
Guides users through a business process that's launched from Lightning pages, Experience Cloud sites, quick actions, and ...
- Record-Triggered Flow
Launches when a record is created, updated, or deleted. This autolaunched flow runs in the background.
- Schedule-Triggered Flow
Launches at a specified time and frequency for each record in a batch. This autolaunched flow runs in the background.
- Platform Event-Triggered Flow
Launches when a platform event message is received. This autolaunched flow runs in the background.
- Autolaunched Flow (No Trigger)
Launches when invoked by Apex, processes, REST API, and more. This autolaunched flow runs in the background.
- Data Cloud-Triggered Flow
Launches when Data Cloud data model object (DMO) or calculated insight object (CIO) conditions are met.
- Record-Triggered Orchestration
Launches when a record is created or updated. An orchestration lets you create a

Create

When to use what?



If the flow must run in the same org you can use triggered flow. If it needs to be in a separate org than you can use data actions.