AWS Service Catalog

Administrator Guide

AWS Service Catalog: Administrator Guide

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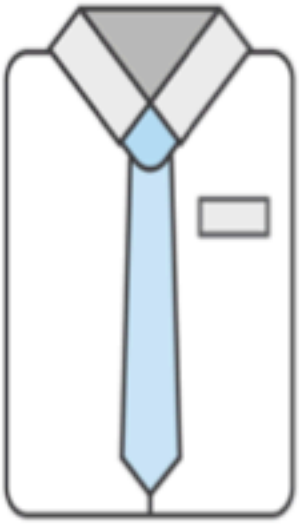
What Is AWS Service Catalog?

AWS Service Catalog allows organizations to create and manage catalogs of IT services that are approved for use on AWS. These IT services can include everything from virtual machine images, servers, software, and databases to complete multi-tier application architectures. AWS Service Catalog allows organizations to centrally manage commonly deployed IT services, and helps organizations achieve consistent governance and meet compliance requirements, while enabling users to quickly deploy only the approved IT services they need with the constraints your organization sets.



Control
Standardization
Governance

Administrator

AWS Service Catalog provides the following benefits:

- **Promote standardization**

Administer and manage approved assets by restricting where the product can be launched, the type of instance that can be used, and many other configuration options. The result is a standardized landscape for product provisioning for your entire organization.

- **Self-service discovery and launch**

  Users browse listings of products (services or applications) that they have access to, locate the product that they want to use, and launch it all on their own as a provisioned product.

- **Fine-grain access controls of configuration and provisioning**

  Administrators assemble portfolios of products from their catalog, add constraints and resource tags to be used at provsioning, and then grant access to the portfolio through AWS Identity and Access Management (IAM) users and groups.

- **Extensibility and version control**

  Administrators can add a product to any number of portfolios and restrict it without creating another copy. Updating the product to a new version propagates the update to all products in every portfolio that references it.

For more service highlights, see the AWS Service Catalog detail page.

The AWS Service Catalog API provides programmatic control over all end-user actions as an alternative to using the AWS Management Console. For more information, see AWS Service Catalog Developer Guide

Concepts

Understanding the basic components of AWS Service Catalog will help you get the most out of this service.

Topics

AWS Service Catalog Users

AWS Service Catalog users might be either of the following types, depending on the level of permissions that they have:

- **Catalog administrators (administrators)** – Manage a catalog of products (applications and services), organizing them into portfolios and granting access to end users. Catalog administrators prepare AWS CloudFormation templates, configure constraints, and manage IAM roles that are assigned to products to provide for advanced resource management.
- **End users** – Receive AWS credentials from their IT department or manager and use the AWS Management Console to launch products to which they have been granted access. Sometimes referred to as simply "*users*", end users may be granted different permissions depending on your operational

requirements. For example, a user may have the maximum permission level (to launch and manage all of the resources required by the products they use) or only permission to use particular service features.

Portfolio

A portfolio is a collection of *products*, together with configuration information. Portfolios help manage who can use specific products and how they can use them. With AWS Service Catalog, you can create a customized portfolio for each type of user in your organization and selectively grant access to the appropriate portfolio. When you add a new *version* of a product to a portfolio, that version is automatically available to all current users. You also can share your portfolios with other AWS accounts and allow the administrator of those accounts to distribute your portfolios with additional *constraints*, such as limiting which EC2 instances a user can create. Through the use of portfolios, permissions, sharing, and constraints, you can ensure that users are launching products that are configured properly for the organization's needs and standards.

Product

A product is an IT service that you want to make available for deployment on AWS. A product can comprise one or more AWS resource, such as EC2 instances, storage volumes, databases, monitoring configurations, and networking components, or packaged AWS Marketplace products. A product can be a single compute instance running AWS Linux, a fully configured multi-tier web application running in its own environment, or anything in between. You most commonly create your products by importing AWS CloudFormation templates. These templates define the AWS resources required for the product, the relationships between resources, and the parameters that the end user can plug in when they launch the product to configure security groups, create key pairs, and perform other customizations.

Provisioned Product

When an end user launches a product, an instance of the product is created and is using resources. Most commonly, a provisioned product is an AWS CloudFormation *stack*.

AWS CloudFormation Stack

AWS CloudFormation stacks make it easier to manage the lifecycle of your product by allowing you to provision, tag, update, and terminate your product instance as a single unit. An AWS CloudFormation stack includes an AWS CloudFormation template, written in either JSON or YAML format, and its associated collection of resources. A *provisioned product* in AWS Service Catalog is most commonly a stack. When an end user launches a product, the instance of the product that is provisioned by AWS Service Catalog is a stack of resources necessary to run the product. For more information, see AWS CloudFormation User Guide.

Versioning

AWS Service Catalog allows you to manage multiple versions of the products in your catalog. This allows you to add new versions of templates and associated resources based on software updates or configuration changes. When you create a new version of a product, the update is automatically distributed to all users who have access to the product, allowing the user to select which version of the product to use. Users can update running instances of the product to the new version quickly and easily.

Permissions

Granting a user access to a portfolio enables that user to browse the portfolio and launch the products in it. You apply AWS Identity and Access Management (IAM) permissions to control who can view and modify

your catalog. IAM permissions can be assigned to IAM users, groups, and roles. When a user launches a product that has an IAM role assigned to it, AWS Service Catalog uses the role to launch the product's cloud resources using AWS CloudFormation. By assigning an IAM role to each product, you can avoid giving users permissions to perform unapproved operations and enable them to provision resources using the catalog.

Constraints

Constraints control the ways that specific AWS resources can be deployed for a product. You can use them to apply limits to products for governance or cost control. There are two distinct types of AWS Service Catalog constraints: *template* and *launch*. **Template constraints** restrict the configuration parameters that are available for the user when launching the product (for example, EC2 instance types or IP address ranges). Template constraints allow you to reuse generic AWS CloudFormation templates for products and apply restrictions to the templates on a per-product or per-portfolio basis. **Launch constraints** allow you to specify a role for a product in a portfolio. This role is used to provision the resources at launch, so you can restrict user permissions without impacting users' ability to provision products from the catalog.

AWS Service Catalog Default Service Limits

By default, AWS limits the products and portfolios you can create, the number of constraints that you can apply to products, and the number of tags that you can apply to portfolios. For limits for each AWS Service Catalog resource, see AWS Service Catalog Limits in *AWS General Reference*.

For more information on limits, including how to increase limits for your account, refer to AWS Service Limits in *AWS General Reference*.

Setting Up

To follow the tutorials in this guide, you will need to set up an account and obtain security credentials. This topic walks you through the setup process.

Topics

Sign Up for Amazon Web Services

To use Amazon Web Services (AWS), you will need to sign up for an AWS account.

To sign up for an AWS account

1. Open https://aws.amazon.com/, and then choose **Create an AWS Account**.
2. Follow the online instructions.

   Part of the sign-up procedure involves receiving a phone call and entering a PIN using the phone keypad.

AWS sends you a confirmation email after the sign up process is complete. At any time, you can view your current account activity and manage your account by going to https://aws.amazon.com/ and choosing **My Account**, **AWS Management Console**.

Get IAM Permissions for Administrators and End Users

Catalog administrators and end users require different IAM permissions to use AWS Service Catalog. As a catalog administrator, you must have IAM permissions that allow you to access the AWS Service Catalog administrator console, create products, and manage products. Before your end users can use your products, you must grant them permissions that allow them to access the AWS Service Catalog end user console, launch products, and manage launched products as provisioned products.

AWS provides many of these permissions with the AWS managed policies for AWS Service Catalog. AWS maintains these policies and provides them in the AWS Identity and Access Management (IAM) service. You can use these policies by attaching them to the IAM users, groups, or roles that you and your end users use. For information about these policies, see Controlling Access Using Service-level Permissions (p. 25). For instructions to grant permissions to end users, see Step 2: Grant IAM Permissions to the AWS Service Catalog End User (p. 15) in Getting Started.

Get AWS CloudFormation Templates (Optional)

A sample AWS CloudFormation template is provided for you to use with the tutorial in Getting Started. This guide will cover some basic aspects of AWS CloudFormation, but you should consult the *AWS CloudFormation User Guide* if you need to create a template for a complex application.

AWS Service Catalog: How It Works

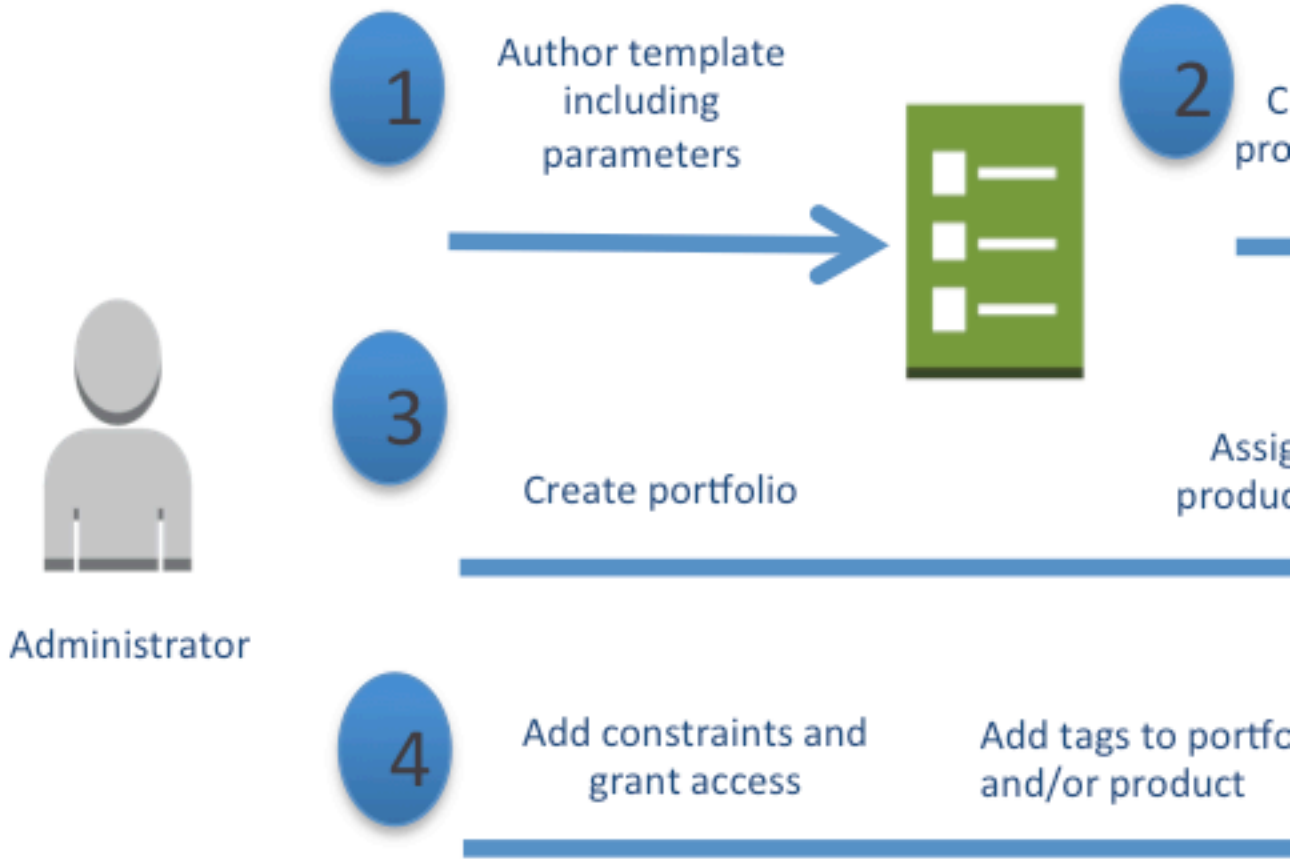
The following sections provide an overview of AWS Service Catalog service components and how they interact with each other.

As discussed in the Concepts (p. 2) section, AWS Service Catalog provides two distinct user types: end users and administrators. This topic provides an overview of administrator and end user actions in the context of a typical workflow.

Topics

Administrator: Catalog Creation

The following diagram shows the initial workflow for an adminstrator in an example catalog creation scenario.


1
Author template including parameters
2
C
pro
3
Create portfolio
Assig
produc
Administrator
4
Add constraints and grant access
Add tags to portfo
and/or product

End User: Product View and Product Provisioning

Using the state of the previous example as a starting point, the following diagram shows the initial workflow for an end user. This example shows the end user product view and provisioning tasks, on the right, as well as the administrator's tasks, on the left. The tasks are numbered in order.

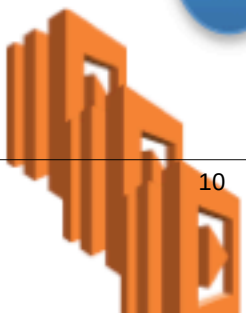
Administrator

5

Notifications and outputs

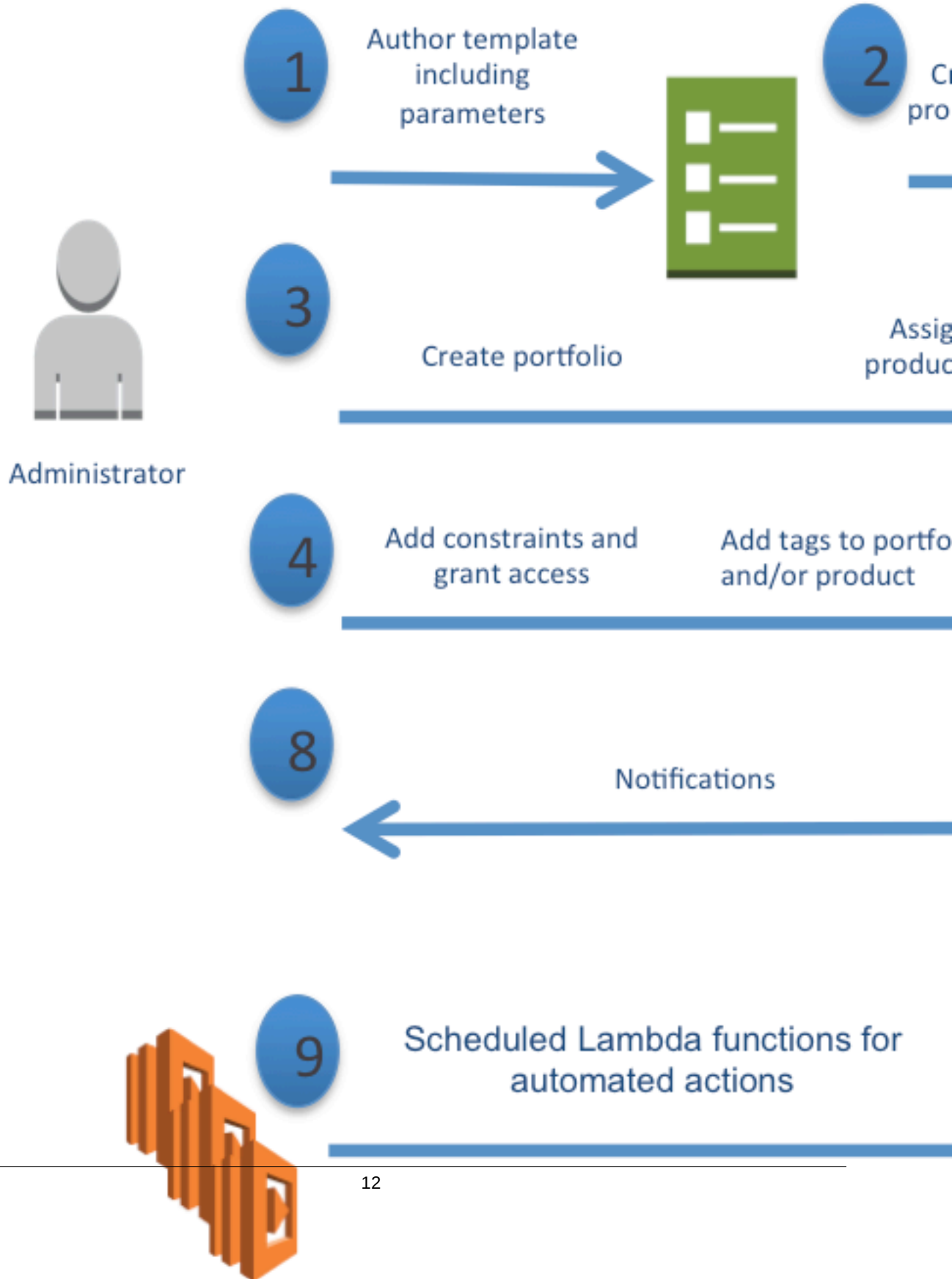
6

Scheduled Lambda functions for automated actions



Overall Workflow

The following diagram brings together the previous two diagrams into one workflow to show the overall interaction of tasks.


1
Author template including parameters
2
3
Create portfolio
Administrator
4
Add constraints and grant access
8
Notifications
9
Scheduled Lambda functions for automated actions

Getting Started

This tutorial introduces you to many of the tasks that you do as a catalog administrator. You will update your AWS Identity and Access Management (IAM) permissions to meet the requirements for catalog administration, and you will create an IAM user for an end user. Then, you will create a product that is based on an AWS CloudFormation template, which defines the AWS resources used by the product. The product, Linux Desktop, is a cloud development environment that runs on Amazon Linux. You will add the product to a portfolio and distribute it to the end user. Finally, you will log in to AWS as the end user to test the product. Note that this will create an Amazon EC2 instance, and you will be billed for the AWS resources used.

> **Note**
> The products and portfolios that you create in AWS Service Catalog must be used in the region in which you create them. When you start this tutorial, check which region your console is set to and keep the same region setting throughout. For more information, see Selecting a Region in the *AWS Management Console Getting Started Guide*.

Topics

Step 1: Get AWS Service Catalog Administrator IAM Permissions

As a catalog administrator, you require access to the AWS Service Catalog administrator console view and IAM permissions that allow you to do tasks such as:

- Creating and managing portfolios
- Creating and managing products

- Adding template constraints to control the options that are available to end users when launching a product
- Adding launch constraints to define the IAM roles that AWS Service Catalog assumes when end users launch products
- Granting end users access to your products

To complete the tutorial, you, or an administrator who manages your IAM permissions, must attach the AWS managed policy `ServiceCatalogAdminFullAccess` to your IAM user, group, or role. Then, you must add a supplementary policy that allows you to do tasks with Amazon EC2 and IAM, which are required to complete this tutorial.

To get IAM permissions as a catalog administrator

1. Sign in to the IAM console at https://console.aws.amazon.com/iam/.
2. In the navigation pane, choose **Users**. If you have already created an IAM user that you would like to use as the catalog administrator, choose that user. Otherwise, do the following:
   a. Choose **Create New Users**.
   b. For **Enter User Names**, type **`ServiceCatalogAdmin`**. Then, choose **Create**. You can then view the user credentials by choosing **Show User Security Credentials**, or you can download the credentials by choosing **Download Credentials**, but neither action is required for this tutorial.
   c. Choose **Close**. If you didn't download the credentials, the console displays a warning that you can ignore. Choose **Close** again to return to the **Users** page. Then, choose **ServiceCatalogAdmin** by clicking on that name.
3. On the details page for the user, choose the **Security Credentials** tab.
4. In the **Sign-In Credentials** section, choose **Manage Password**. Choose the password options that you want, and choose **Apply**. To see the password, choose **Show User Security Credentials**. Save the password in a secure location, and then choose **Close**.
5. On the details page for the user, choose the **Permissions** tab.
6. In the **Managed Policies** section, choose **Attach Policy**.
7. On the **Attach Policy** page, choose the checkbox for **ServiceCatalogAdminFullAccess**, and then choose **Attach Policy**.
8. On the details page for the user, choose the **Permissions** tab if it is not already open.
9. Expand the **Inline Policies** section, and choose **click here**.
10. Choose **Custom Policy**, and then choose **Select**.
11. For **Policy Name**, type **`ServiceCatalogAdmin-SupplementalPermissions`**.
12. Copy the following example policy, and paste it in the **Policy Document** editor:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
                "ec2:CreateKeyPair",
                "iam:AddRoleToInstanceProfile",
                "iam:AddUserToGroup",
                "iam:AttachGroupPolicy",
                "iam:CreateAccessKey",
                "iam:CreateGroup",
                "iam:CreateInstanceProfile",
                "iam:CreateLoginProfile",
                "iam:CreateRole",
                "iam:CreateUser",
                "iam:Get*",
```

```
                "iam:List*",
                "iam:PutRolePolicy",
                "iam:UpdateAssumeRolePolicy"
            ],
            "Resource": [
                "*"
            ]
        }
    ]
}
```

Revise the policy as needed to meet the security requirements of your organization.

13. Choose **Apply Policy**.
14. Sign in as the catalog administrator using the user name and password you created in previous steps. You can sign in by visiting your account-specific URL, which you can see by choosing **Dashboard** in the navigation pane of the IAM console. The URL has the form:

    https://*AccountID*.signin.aws.amazon.com/console

    Make a note of the sign-in URL for later use.

    You can customize this URL to replace the account ID with an alias that you specify. For details, see the IAM User Guide.

Step 2: Grant IAM Permissions to the AWS Service Catalog End User

Before the end user can use AWS Service Catalog, you must grant access to the AWS Service Catalog end user console view. To grant access, you attach the AWS managed policy **ServiceCatalogEndUserAccess** to the IAM user, group, or role that is used by the end user.

This policy allows the end user to access the end user console view, but not to launch products or manage provisioned products. You will grant permissions for those tasks when you provide an inline policy to the group you create in this step, and in a later section of the tutorial you attach a launch role to your product to finish adding all the permissions you'll need for this specific tutorial. The goal of this is to demonstrate the various levels where permissions can be applied based on common scenarios for using the service. For more information about AWS managed policies for AWS Service Catalog, see Controlling Access Using Service-level Permissions (p. 25).

To grant IAM permissions to the end user

1. Sign in to the IAM console at https://console.aws.amazon.com/iam/.
2. Choose **Users** in the navigation pane, and choose **Create New Users**.
3. For **Enter User Names**, type **`Engineer`**, and then choose **Create**.
4. Choose **Close** twice to return to the **Users** page, and then choose **Engineer** by clicking on that name.
5. Choose the **Security Credentials** tab, if it is not already selected.
6. In the **Sign-In Credentials** section, choose **Manage Password**. Choose the password options that you want, and then choose **Apply**. To see the password, choose **Show User Security Credentials**. Save the password in a secure location, and then choose **Close**.
7. In the Navigation pane, choose **Groups**, and then choose **Create New Group**.
8. For **Group Name**, type **`Engineers`**, and then choose **Next Step**.
9. Choose the checkbox for the **ServiceCatalogEndUserAccess** policy, and then choose **Next Step**.
10. On the **Review page**, choose **Create Group**.

11. Choose **Engineers**.
12. On the details page for the group, choose the **Permissions** tab if you are not already on that tab.
13. Expand the **Inline Policies** section, and choose **click here**.
14. Choose **Custom Policy**, **Select**.
15. For **Policy Name**, type **`ServiceCatalogEngineerGroup-SupplementalPermissions`**.
16. Copy the following example policy, and paste it in the **Policy Document** editor:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
                "servicecatalog:ProvisionProduct"
            ],
            "Resource": "*"
        }
    ]
}
```

    Revise the policy as needed to meet the security requirements of your organization.
17. Choose **Apply Policy**.
18. On the **Users** tab, choose **Add Users to Group**.
19. Select the user named **Engineer** and choose **Add Users**.

Step 3: Get Familiar with the AWS CloudFormation Template

To provision and configure portfolios and products, you use AWS CloudFormation templates, which are JSON– or YAML-formatted text files. For more information, see Template Formats in the *AWS CloudFormation User Guide*. These templates describe the resources that you want to provision. You can use the AWS CloudFormation editor or any text editor to create and save templates. For this tutorial, a simple template will get you started, so we've provided one called development-environment. This template launches a single Linux instance configured for SSH access.

The sample template provided for this tutorial, `development-environment.template`, is available at https://awsdocs.s3.amazonaws.com/servicecatalog/development-environment.template.

The text of the provided template follows:

```
{
  "AWSTemplateFormatVersion" : "2010-09-09",

  "Description" : "AWS Service Catalog sample template. Creates an Amazon EC2 instance
                   running the Amazon Linux AMI.The AMI is chosen based on the region
                   in which the stack is run. This example creates an EC2 security
                   group for the instance to give you SSH access. **WARNING** This
                   template creates an Amazon EC2 instance. You will be billed for the
                   AWS resources used if you create a stack from this template.",

  "Parameters" : {
    "KeyName": {
      "Description" : "Name of an existing EC2 key pair for SSH access to the EC2
 instance.",
     "Type": "AWS::EC2::KeyPair::KeyName"
```

```
  },

  "InstanceType" : {
    "Description" : "EC2 instance type.",
    "Type" : "String",
    "Default" : "t2.micro",
    "AllowedValues" : [ "t2.micro", "t2.small", "t2.medium", "m3.medium", "m3.large",
      "m3.xlarge", "m3.2xlarge" ]
  },

  "SSHLocation" : {
    "Description" : "The IP address range that can SSH to the EC2 instance.",
    "Type": "String",
    "MinLength": "9",
    "MaxLength": "18",
    "Default": "0.0.0.0/0",
    "AllowedPattern": "(\\d{1,3})\\.(\\d{1,3})\\.(\\d{1,3})\\.(\\d{1,3})/(\\d{1,2})",
    "ConstraintDescription": "Must be a valid IP CIDR range of the form x.x.x.x/x."
 }
},

"Metadata" : {
  "AWS::CloudFormation::Interface" : {
    "ParameterGroups" : [{
      "Label" : {"default": "Instance configuration"},
      "Parameters" : ["InstanceType"]
    },{
      "Label" : {"default": "Security configuration"},
      "Parameters" : ["KeyName", "SSHLocation"]
    }],
    "ParameterLabels" : {
      "InstanceType": {"default": "Server size:"},
      "KeyName": {"default": "Key pair:"},
      "SSHLocation": {"default": "CIDR range:"}
    }
  }
},

"Mappings" : {
  "AWSRegionArch2AMI" : {
    "us-east-1"      : { "HVM64" : "ami-08842d60" },
    "us-west-2"      : { "HVM64" : "ami-8786c6b7" },
    "us-west-1"      : { "HVM64" : "ami-cfa8a18a" },
    "eu-west-1"      : { "HVM64" : "ami-748e2903" },
    "ap-southeast-1" : { "HVM64" : "ami-d6e1c584" },
    "ap-northeast-1" : { "HVM64" : "ami-35072834" },
    "ap-southeast-2" : { "HVM64" : "ami-fd4724c7" },
    "sa-east-1"      : { "HVM64" : "ami-956cc688" },
    "cn-north-1"     : { "HVM64" : "ami-ac57c595" },
    "eu-central-1"   : { "HVM64" : "ami-b43503a9" }
  }

},

"Resources" : {
  "EC2Instance" : {
    "Type" : "AWS::EC2::Instance",
    "Properties" : {
      "InstanceType" : { "Ref" : "InstanceType" },
      "SecurityGroups" : [ { "Ref" : "InstanceSecurityGroup" } ],
      "KeyName" : { "Ref" : "KeyName" },
      "ImageId" : { "Fn::FindInMap" : [ "AWSRegionArch2AMI", { "Ref" : "AWS::Region" },
"HVM64" ] }
    }
  },
```

```
    "InstanceSecurityGroup" : {
      "Type" : "AWS::EC2::SecurityGroup",
      "Properties" : {
        "GroupDescription" : "Enable SSH access via port 22",
        "SecurityGroupIngress" : [ {
          "IpProtocol" : "tcp",
          "FromPort" : "22",
          "ToPort" : "22",
          "CidrIp" : { "Ref" : "SSHLocation"}
        } ]
      }
    }
  },

  "Outputs" : {
    "PublicDNSName" : {
      "Description" : "Public DNS name of the new EC2 instance",
      "Value" : { "Fn::GetAtt" : [ "EC2Instance", "PublicDnsName" ] }
    },
    "PublicIPAddress" : {
      "Description" : "Public IP address of the new EC2 instance",
      "Value" : { "Fn::GetAtt" : [ "EC2Instance", "PublicIp" ] }
    }
  }
}
```

The template declares the resources that will be created when the product is launched. It consists of seven sections:

- **AWSTemplateFormatVersion** – The version of the AWS Template Format used to create this template.
- **Description** – A description of the template.
- **Parameters** – Three parameters that your user must specify to launch the product. For each parameter, the template includes a description and constraints that must be met by the value typed. For more information about constraints, see Using Constraints (p. 30).

  The `KeyName` parameter allows you to specify an Amazon Elastic Compute Cloud (Amazon EC2) key pair name that end users must provide when they use AWS Service Catalog to launch your product. You will create the key pair in the next step.
- **Metadata** – An optional section that defines details about the template. In this template, the metadata section contains the `AWS::CloudFormation::Interface` key, which defines how the end user console view displays parameters. The `ParameterGroups` property defines how parameters are grouped and headings for those groups. The `ParameterLabels` property defines friendly parameter names. When a user is specifying parameters to launch a product that is based on this template, the end user console view displays the parameter labeled `Server size:` under the heading `Instance configuration`, and it displays the parameters labeled `Key pair:` and `CIDR range:` under the heading `Security configuration`.

  For more information about defining parameter groups and labels, see AWS::CloudFormation::Interface in the *AWS CloudFormation User Guide*.
- **Mappings** – A list of regions and the Amazon Machine Image (AMI) that corresponds to each. AWS Service Catalog uses the mapping to determine which AMI to use based on the region that the user selects in the AWS Management Console.
- **Resources** – An EC2 instance running Amazon Linux and a security group that allows SSH access to the instance. The `Properties` section of the EC2 instance resource uses the information that the user types to configure the instance type and a key name for SSH access.

  AWS CloudFormation uses the current region to select the AMI ID from the mappings defined earlier and assigns a security group to it. The security group is configured to allow inbound access on port 22 from the CIDR IP address range that the user specifies.

- **Outputs** – Text that tells the user when the product launch is complete. The provided template gets the public DNS name of the launched instance and displays it to the user. The user needs the DNS name to connect to the instance using SSH.

Step 4: Create a Key Pair

To enable your end users to launch the product that is based on the sample template for this tutorial, you must create an Amazon EC2 key pair. A key pair is a combination of a public key that is used to encrypt data and a private key that is used to decrypt data. For more information about key pairs, see Amazon EC2 Key Pairs in the *Amazon EC2 User Guide for Linux Instances*.

The AWS CloudFormation template for this tutorial, `development-environment.template`, includes the `KeyName` parameter:

```
. . .
  "Parameters" : {
    "KeyName": {
      "Description" : "Name of an existing EC2 key pair for SSH access to the EC2
 instance.",
      "Type": "AWS::EC2::KeyPair::KeyName"
    },
. . .
```

End users must specify the name of a key pair when they use AWS Service Catalog to launch the product that is based on the template.

If you already have a key pair in your account that you would prefer to use, you can skip ahead to Step 5: Create an AWS Service Catalog Portfolio (p. 19). Otherwise, complete the following steps.

To create a key pair

1. Sign in to the AWS Management Console and open the Amazon EC2 console at https://console.aws.amazon.com/ec2/.
2. In the navigation pane, under **Network & Security**, choose **Key Pairs**.
3. On the **Key Pairs** page, choose **Create Key Pair**.
4. For **Key pair name**, type a name that is easy for you to remember, and then choose **Create**.
5. When the console prompts you to save the private key file, save it in a safe place.

   Important
   This is the only chance for you to save the private key file. You'll need to provide the name of your key pair when you launch an instance and the corresponding private key each time you connect to the instance.
   Your end users will require the name of your key pair when they use AWS Service Catalog to launch your product.

Step 5: Create an AWS Service Catalog Portfolio

To provide users with products, begin by creating a portfolio for those products.

To create a portfolio

1. Sign in to the AWS Management Console and open the AWS Service Catalog console at https://console.aws.amazon.com/servicecatalog/.

2. If you are using the AWS Service Catalog administrator console for the first time, choose **Get started** to start the wizard for configuring a portfolio. Otherwise, choose **Create portfolio**.
3. Type the following values:

   - **Portfolio name** – `Engineering Tools`
   - **Description** – `Sample portfolio that contains a single product.`
   - **Owner** – `IT (it@example.com)`
4. Choose **Create**. AWS Service Catalog creates the portfolio and displays the portfolio details page. This page displays information about the portfolio and allows you to add products.
5. Expand the **Tags** section. For **Key**, type `Group`, and for **Value**, type `Engineering`. Then, choose **Add tag**.

Step 6: Create an AWS Service Catalog Product

After you have created a portfolio, you're ready to add a product. For this tutorial, you will create a product called Linux Desktop, which is a cloud development environment that runs on Amazon Linux. If you've just completed the previous step, the portfolio details page will already be displayed. If you've left the page and need to return to it, from the AWS Management Console, choose **Service Catalog**, and then choose **Engineering Tools**.

To create a product

1. On the portfolio details page, choose **Upload new product**, and then type the following:

   - **Product name** – `Linux Desktop`
   - **Short Description** – `Cloud development environment.`
   - **Description** – `Cloud development environment configured for engineering staff. Runs AWS Linux.`
   - **Provided by** – `IT`
   - **Vendor** – *(blank)*

   Choose **Next**.
2. On the **Enter support details** page, type the following:

   - **Email contact** – `ITSupport@example.com`
   - **Support link** – `https://wiki.example.com/IT/support`
   - **Support description** – `Contact the IT department for issues deploying or connecting to this product.`

   Choose **Next**.
3. On the **Version details** page, type the following:

   - **Select template** – Choose **Specify an Amazon S3 template URL** and type the following URL:

     `https://awsdocs.s3.amazonaws.com/servicecatalog/development-environment.template`
   - **Version title** – `v1.0`
   - **Description** – `Base Version`

   Choose **Next**.
4. On the **Review** page, verify the information you provided.

5. Choose **Confirm and upload** to create the product and add it to the Engineering Tools portfolio.

Step 7: Add a Template Constraint to Limit Instance Size

Constraints add another layer of control over products at the portfolio level. Constraints can control the launch context of a product (launch constraints), or add rules to the AWS CloudFormation template (template constraints). For more information about constraints, see Using Constraints (p. 30).

Now add a template constraint to the Linux Desktop product that prevents users from selecting large instance types at launch time. The development-environment template allows the user to select from six instance types; this constraint limits valid instance types to the two smallest types, t2.micro and t2.small. For more information about these instance types, see T2 Instances in the Amazon EC2 User Guide for Linux Instances.

If you've just completed the previous step, the portfolio details page will already be displayed. If you've left the page and need to return to it, from the AWS Management Console, choose **Service Catalog**, and then choose **Engineering Tools**.

To add a template constraint to the Linux Desktop product

1. On the portfolio details page, expand the **Constraints** section, and choose **Add constraints**.
2. In the **Select product and type** window, for **Product**, choose **Linux Desktop**. Then, for **Constraint type**, choose **Template**.
3. Choose **Continue**.
4. For **Description**, type `Small instance sizes`.
5. Paste the following into the **Template constraint** text box:

```
{
  "Rules": {
    "Rule1": {
      "Assertions": [
        {
          "Assert" : {"Fn::Contains": [["t2.micro", "t2.small"], {"Ref":
 "InstanceType"}]},
          "AssertDescription": "Instance type should be t2.micro or t2.small"
        }
      ]
    }
  }
}
```

6. Choose **Submit**.

Step 8: Add a Launch Constraint to Assign an IAM Role

A launch constraint designates an IAM role that AWS Service Catalog assumes when an end user launches a product. For this step, you will add a launch constraint to the Linux Desktop product so that AWS Service Catalog can use the AWS resources that are part of the product's AWS CloudFormation template. This launch constraint will enable the end user to launch the product and, after it is launched, manage it as a provisioned product. For more information, see Applying a Launch Constraint (p. 30).

Without a launch constraint, you would need to grant additional IAM permissions to your end users before they could use the Linux Desktop product. The `ServiceCatalogEndUserAccess` policy that you applied to the `Engineers` group grants only the minimum IAM permissions required to access the AWS Service Catalog end user console view. By using a launch constraint, you can keep your end users' IAM permissions to a minimum, which is an IAM best practice. For more information about this best practice, see Grant least privilege in the *IAM User Guide*.

To create the IAM role

1. Sign in to the AWS Management Console, and open the IAM console at https://console.aws.amazon.com/iam/.
2. In the Navigation pane, choose **Roles**, and then choose **Create New Role**.
3. For **Role Name**, type **`linuxDesktopLaunchRole`**. Then, choose **Next Step**.
4. Under **AWS Service Roles** next to **AWS Service Catalog**, choose **Select**.
5. On the **Attach Policy** page, Choose **Next Step**.
6. On the **Review** page, review the information for your role, and then choose **Create Role**.

To attach a policy to the new role

1. On the **Roles** page, choose **linuxDesktopLaunchRole**.
2. On the role details page, choose the **Permissions** tab, expand the **Inline Policies** section, and then, choose **click here**.
3. Choose **Custom Policy**, and then choose **Select**.
4. For **Policy Name**, type **`linuxDesktopPolicy`**.

   Copy the following policy, and paste it into the **Policy Document** editor:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
                "catalog-user:*",
                "cloudformation:CreateStack",
                "cloudformation:DeleteStack",
                "cloudformation:DescribeStackEvents",
                "cloudformation:DescribeStacks",
                "cloudformation:GetTemplateSummary",
                "cloudformation:SetStackPolicy",
                "cloudformation:ValidateTemplate",
                "cloudformation:UpdateStack",
                "ec2:*",
                "s3:GetObject",
                "sns:*"
            ],
            "Resource": "*"
        }
    ]
}
```

5. Choose **Apply Policy**.

To assign the role to a product as a launch constraint

1. Go to the AWS Service Catalog console at https://console.aws.amazon.com/servicecatalog/.
2. Choose the **Engineering Tools** portfolio.

3. On the portfolio details page, expand the **Constraints** section, and then choose **Add constraints**.
4. In the **Select product and type** window, for **Product**, choose **Linux Desktop**, and for **Constraint type**, choose **Launch**. Then choose **Continue**.
5. On the **Launch constraint** page, for **IAM role**, choose **linuxDesktopLaunchRole**, and then choose **Submit**.

Step 9: Grant End Users Access to Your Portfolio

Now that you have created a portfolio and added a product, you are ready to give end users access.

If you've just completed the previous step, the portfolio details page will already be displayed. If you've left the page and need to return to it, from the AWS Management Console, choose **Service Catalog**, and then choose **Engineering Tools**.

To provide access to the portfolio

1. On the portfolio details page, expand the **Users, groups and roles** section, and then choose **Add user, group or role**.
2. Choose the **Groups** tab if it is not already open, and select **Engineers**.
3. Choose **Add Access**.

Step 10: Test the End User Experience

To verify that the Engineer end user can successfully access the end user console view and launch your product, sign in to AWS as the end user and perform those tasks.

To verify that the Engineer end user can access the end user console

1. Sign in to AWS as the Engineer IAM user by going to your account-specific user sign-in page. You can find the URL for your account sign-in on the dashboard of the IAM console. The URL has the following form:

   ```
   https://AccountID.signin.aws.amazon.com/console
   ```

   Tip
   When you sign in as the Engineer user, you be signed out of your current session. If you prefer to keep your current session active, you can sign in as the Engineer user in a private browsing window.
2. In the AWS Management Console menu, choose the region in which you created the `Engineering Tools` portfolio. For example, if you created the portfolio in the **US East (N. Virginia)** region, choose that region.
3. Open the AWS Service Catalog console at https://console.aws.amazon.com/servicecatalog/.

   You now see a list of products and provisioned products:

   - **Products** – The products that the user can use.
   - **Provisioned products** – The provisioned products that the user has launched.

To verify that the Engineer end user can launch the Linux Desktop product

1. In the **Products** section of the console, choose **Linux Desktop**.

This page lists the product information that end users will see, including the product name, description, and support details.

2. Choose **Launch product** to start the wizard for configuring your product.
3. On the **Product version** page, for **Name**, type **`Linux-Desktop`**.
4. In the **Version** table, choose **v1.0**.
5. Choose **Next**.
6. On the **Parameters** page, type the following:

   - **Server size** – Choose **`t2.micro`**.
   - **Key pair** – Select the key pair that you created in Step 4: Create a Key Pair (p. 19).
   - **CIDR range** – Type a valid CIDR range for the IP address from which you will connect to the instance. This can be the default value (0.0.0.0/0) to allow access from any IP address, your IP address followed by **`/32`** to restrict access to your IP address only, or something in between.

   Choose **Next**.
7. On the **Tags** page, choose **Next**.
8. On the **Review** page, review the information that you typed, and then choose **Launch** to launch the stack. The console displays the stack details page for the Linux-Desktop stack. On this page, the status will display **Launching** while AWS Service Catalog launches the product, which takes several minutes. To see the latest status, refresh your browser. After the product is launched, the status will display **Available**.

Controlling Access and Constraints

An AWS Service Catalog administrator needs to be aware of the various ways to control access to the service, portfolios, and products. The following sections provide detailed information about each type of access control:

Topics

Controlling Access Using Service-level Permissions

Control the level of access that administrators and end users have to AWS Service Catalog and AWS resources by applying AWS policies through AWS Identity and Access Management (IAM). These polices are either created and managed by AWS or individually by administrators and end users. To control access, you attach these policies to the IAM users, groups, and roles that you use with AWS Service Catalog. Also, you can customize the access level for each action with support for user, role, and account levels. This allows users to be granted access to view, update, terminate, and manage provisioned products created under their role or the account to which they are logged in.

Topics

AWS Managed Policies

AWS addresses many common use cases by providing standalone IAM policies that are created and administered by AWS. These AWS managed policies grant necessary permissions for common use cases

so that you can avoid having to investigate what permissions are needed. For more information, see AWS Managed Policies in the *IAM User Guide*.

IAM provides the following AWS managed policies for AWS Service Catalog. They are preconfigured to provide the permissions that AWS Service Catalog administrators need to create and manage products, and they provide the initial permissions that end users need to launch products and manage provisioned products.

Administrators

- **ServiceCatalogAdminFullAccess** — Grants full access to administrator console view and permission to create and manage products and portfolios.
- **ServiceCatalogAdminReadOnlyAccess** — Grants full access to administrator console view. Cannot create or manage products and portfolios.

End users

- **ServiceCatalogEndUserFullAccess** — Grants full access to end user console view and permission to launch products and manage provisioned products.
- **ServiceCatalogEndUserAccess** — Grants full access to end user console view, Cannot launch products or manage provisioned products.

To attach a policy to an IAM user

1. Open the IAM console at https://console.aws.amazon.com/iam/.
2. In the navigation pane, choose **Users**.
3. Choose the name (not the check box) of the IAM user.
4. On the **Permissions** tab, choose **Attach Policy**.
5. On the **Attach Policy** page, select the check box next to the policy, and then choose **Attach Policy**.

> **Note**
> You can review these permissions policies by signing in to the IAM console and searching for specific policies there.

You can also create your own custom IAM policies to allow permissions for AWS Service Catalog actions and resources. You can attach these custom policies to the IAM users or groups that require those permissions.

Console Access for End Users

Before end users can use a product to which you give access, you must provide them additional IAM permissions to allow them to use each of the underlying AWS resources in a product's AWS CloudFormation template. For example, if a product template includes Amazon Relational Database Service (Amazon RDS), you must grant the users Amazon RDS permissions to launch the product.

The **ServiceCatalogEndUserFullAccess** and **ServiceCatalogEndUserAccess** polices grant access to the AWS Service Catalog end user console view. When a user who has either of these policies chooses **Service Catalog** in the AWS Management Console, the end user console view displays.

If you apply the **ServiceCatalogEndUserAccess** policy, your users have access to the end user console, but they won't have the permissions that they need to launch products and manage provisioned products. You can grant these permissions directly to an end user using IAM, but if you want to limit the access that end users have to AWS resources, you should attach the policy to a launch role. You then use AWS Service Catalog to apply the launch role to a launch constraint for the product. For more information about applying a launch role, launch role limitations, and a sample launch role, see Applying a Launch Constraint (p. 30).

If you grant users the following IAM permissions, which are meant for AWS Service Catalog administrators, the administrator console view displays instead:

- `catalog-admin:ListPortfolios`
- `catalog-admin:SearchListings`

Don't grant end users these permissions unless you want them to have access to the administrator console view.

Product Access for End Users

Before end users can use a product to which you give access, you must provide them additional IAM permissions to allow them to use each of the underlying AWS resources in a product's AWS CloudFormation template. For example, if a product template includes Amazon Relational Database Service (Amazon RDS), you must grant the users Amazon RDS permissions to launch the product.

If you apply the `ServiceCatalogEndUserAccess` policy, your users have access to the end user console view, but they won't have the permissions that they need to launch products and manage provisioned products. You can grant these permissions directly to an end user in IAM, but if you want to limit the access that end users have to AWS resources, you should attach the policy to a launch role. You then use AWS Service Catalog to apply the launch role to a launch constraint for the product. For more information about applying a launch role, launch role limitations, and a sample launch role, see Applying a Launch Constraint (p. 30).

Example Access Policies for Provisioned Product Management

You can customize your own policies to help meet the security requirements of your organization. The following sections describe some examples of how to customize the access level for each action with support for user, role, and account levels. This allows users to be granted access to view, update, terminate, and manage provisioned products created only by that user or created by others also under their role or the account to which they are logged in. This access is hierarchical — granting account level access also grants role level access and user level access, while adding role level access also grants user level access but not account level access. These can be specified in the policy JSON within a `Condition` block as `accountLevel`, `roleLevel`, or `userLevel`, as shown in the examples.

These examples also apply to access levels for AWS Service Catalog API write operations UpdateProvisionedProduct and TerminateProvisionedProduct, and read operations DescribeRecord, ScanProvisionedProducts, and ListRecordHistory. The ScanProvisionedProducts and ListRecordHistory API operations use an input called AccessLevelFilterKey, and that key's values correspond to the Condition block levels discussed here (`accountLevel` is equivalent to an AccessLevelFilterKey value of "Account", `roleLevel` to "Role", and `userLevel` to "User"). For more information, see the AWS Service Catalog Developer Guide.

Topics

Full Admin Access to Provisioned Products

The following policy allows full read and write access to provisioned products and records within the catalog at the account level.

```
{
   "Version":"2012-10-17",
   "Statement":[
      {
         "Effect":"Allow",
         "Action":[
            "servicecatalog:*"
         ],
         "Resource":"*",
         "Condition": {
            "StringEquals": {
               "servicecatalog:accountLevel": "self"
            }
         }
      }
   ]
}
```

This policy is functionally equivalent to the following policy:

```
{
   "Version":"2012-10-17",
   "Statement":[
      {
         "Effect":"Allow",
         "Action":[
            "servicecatalog:*"
         ],
         "Resource":"*"
      }
   ]
}
```

In other words, not specifying a `Condition` block in any policy for AWS Service Catalog is treated as the same as specifying `"servicecatalog:accountLevel"` access. Note that `accountLevel` access includes `roleLevel` and `userLevel` access.

End-user Access to Provisioned Products

The following policy restricts access to read and write operations to only the provisioned products or associated records that the current user created.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
                "servicecatalog:DescribeProduct",
                "servicecatalog:DescribeProductView",
                "servicecatalog:DescribeProvisioningParameters",
                "servicecatalog:DescribeRecord",
                "servicecatalog:ListLaunchPaths",
                "servicecatalog:ListRecordHistory",
                "servicecatalog:ProvisionProduct",
                "servicecatalog:ScanProvisionedProducts",
                "servicecatalog:SearchProducts",
                "servicecatalog:TerminateProvisionedProduct",
                "servicecatalog:UpdateProvisionedProduct"
            ],
            "Resource": "*",
```

```
            "Condition": {
                "StringEquals": {
                    "servicecatalog:userLevel": "self"
                }
            }
        }
    ]
}
```

Partial Admin Access to Provisioned Products

The two policies below, if both applied to the same user, allow what might be called a type of "partial admin access" by providing full read-only access and limited write access. This means the user can see any provisioned product or associated record within the catalog's account but cannot perform any actions on any provisioned products or records that aren't owned by that user.

The first policy allows the user access to write operations on the provisioned products that the current user created, but no provisioned products created by others. The second policy adds full access to read operations on provisioned products created by all (user, role, or account).

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
                "servicecatalog:DescribeProduct",
                "servicecatalog:DescribeProductView",
                "servicecatalog:DescribeProvisioningParameters",
                "servicecatalog:ListLaunchPaths",
                "servicecatalog:ProvisionProduct",
                "servicecatalog:SearchProducts",
                "servicecatalog:TerminateProvisionedProduct",
                "servicecatalog:UpdateProvisionedProduct"
            ],
            "Resource": "*",
            "Condition": {
                "StringEquals": {
                    "servicecatalog:userLevel": "self"
                }
            }
        }
    ]
}
```

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
                "servicecatalog:DescribeRecord",
                "servicecatalog:ListRecordHistory",
                "servicecatalog:ScanProvisionedProducts"
            ],
            "Resource": "*",
            "Condition": {
                "StringEquals": {
                    "servicecatalog:accountLevel": "self"
                }
            }
```

```
        }
    ]
}
```

Using Constraints

To control which rules are applied when the end user launches a product from a specific portfolio, you apply constraints. You apply constraints to products from the portfolio details page. Constraints are active as soon as you create them and apply to all current versions of a product that are not already launched when you create the constraint.

Topics

Applying a Launch Constraint

A launch constraint designates an AWS Identity and Access Management (IAM) role that AWS Service Catalog assumes when an end user launches a product. An IAM role is a collection of permissions that an IAM user or AWS service can assume temporarily to use AWS services. For an introductory example, see Step 8: Add a Launch Constraint to Assign an IAM Role (p. 21) in Getting Started (p. 13) .

> **Note**
> Launch constraints are associated with a product within the portfolio (product-portfolio association), not at the portfolio level or to a product across all portfolios. To associate a launch constraint with all products in a portfolio, you must apply the launch constraint to each product individually.

Without a launch constraint, end users must launch and manage products with their own IAM credentials. To do so, they must have permissions for AWS CloudFormation, the AWS services used by the products, and AWS Service Catalog. By using a launch role, you can instead limit the end users' permissions to the minimum that they require for that product. For more information about end user permissions, see Controlling Access Using Service-level Permissions (p. 25).

> **Note**
> To create and assign IAM roles, you must have the following IAM administrative permissions:

```
iam:CreateRole
iam:PutRolePolicy
iam:PassRole
iam:Get*
iam:List*
```

Configuring a Launch Role

The IAM role that you assign to a product as a launch constraint must have permissions to use the following AWS services:

- AWS CloudFormation.
- The services that are in the AWS CloudFormation template for the product.
- Amazon Simple Storage Service (Amazon S3). AWS Service Catalog must have read access to the AWS CloudFormation template in Amazon S3.

The IAM role also must have a trust relationship with AWS Service Catalog, which you assign by selecting **AWS Service Catalog** as the role type in the following procedure. The trust relationship allows AWS Service Catalog to assume the role during the launch process to create resources.

> **Note**
> The `servicecatalog:ProvisionProduct`, `servicecatalog:TerminateProduct`, and `servicecatalog:UpdateProduct` permissions cannot be assigned in a launch role. You must use IAM roles, as shown in the inline policy steps in the section Step 2: Grant IAM Permissions to the AWS Service Catalog End User (p. 15).

To create a launch role

1. Sign in to the AWS Management Console and open the IAM console at https://console.aws.amazon.com/iam/.
2. Choose **Roles**.
3. Choose **Create New Role**.
4. Enter a role name and choose **Next Step**.
5. Under **AWS Service Roles** next to **AWS Service Catalog**, choose **Select**.
6. On the **Attach Policy** page, Choose **Next Step**.
7. To create the role, choose **Create Role**.

To attach a policy to the new role

1. Choose the role that you created to view the role details page.
2. Choose the **Permissions** tab, and expand the **Inline Policies** section. Then, choose **click here**.
3. Choose **Custom Policy**, and then choose **Select**.
4. Enter a name for the policy, and then paste the following into the **Policy Document** editor:

```
{
   "Version":"2012-10-17",
   "Statement":[
      {
         "Effect":"Allow",
         "Action":[
            "catalog-user:*",
            "cloudformation:CreateStack",
            "cloudformation:DeleteStack",
            "cloudformation:DescribeStackEvents",
            "cloudformation:DescribeStacks",
            "cloudformation:GetTemplateSummary",
            "cloudformation:SetStackPolicy",
            "cloudformation:ValidateTemplate",
            "cloudformation:UpdateStack",
            "s3:GetObject"
         ],
         "Resource":"*"
      }
   ]
}
```

5. Add a line to the policy for each additional service that the product uses. For example, to add permission for Amazon Relational Database Service (Amazon RDS), type a comma at the end of the last line in the `"Action"` list, and then add the following line:

```
"rds:*"
```

6. Choose **Apply Policy**.

Applying a launch constraint

Next, assign the role to the product as a launch constraint. This tells AWS Service Catalog to assume the role when an end user launches the product.

To assign the role to a product

1. Go to the AWS Service Catalog console at https://console.aws.amazon.com/servicecatalog/.
2. Choose the portfolio that contains the product.
3. Expand the **Constraints** section and choose **Add constraints**.
4. Choose the product and set **Constraint type** to **Launch**. Choose **Continue**.
5. For **IAM role**, choose the launch role Enter and choose **Submit**.

Verify That the Launch Constraint Is Applied

Verify that AWS Service Catalog uses the role to launch the product and that the provisioned product is created successfully by launching the product from the AWS Service Catalog console. To test a constraint prior to releasing it to users, create a test portfolio that contains the same products and test the constraints with that portfolio.

To launch the product

1. In the menu for the AWS Service Catalog console, choose **Service Catalog**, **End user**.
2. Choose the product to open the **Product details** page. In the **Launch options** table, verify that the Amazon Resource Name (ARN) of the role appears.
3. Choose **Launch product**.
4. Proceed through the launch steps, filling in any required information.
5. Verify that the product starts successfully.

Applying a Template Constraint

To limit the options that are available to end users when they launch a product, you apply template constraints. Apply template constraints to ensure that the end users can use products without breaching the compliance requirements of your organization. You apply template constraints to a product in an AWS Service Catalog portfolio. A portfolio must contain one or more products before you can define template constraints.

A template constraint consists of one or more rules that narrow the allowable values for parameters that are defined in the product's underlying AWS CloudFormation template. The parameters in an AWS CloudFormation template define the set of values that users can specify when creating a stack. For example, a parameter might define the various instance types (such as t1.micro, m1.large, and so on) that users can choose from when launching a stack that includes EC2 instances.

If the set of parameter values in a template is too broad for the target audience of your portfolio, you can define template constraints to limit the values that users can choose when launching a product. For example, if the template parameters include EC2 instance types that are too large for users who should use only small instance types (such as t2.micro or t2.small), then you can add a template constraint to limit the instance types that end users can choose. For more information about AWS CloudFormation template parameters, see Parameters in the AWS CloudFormation User Guide.

Template constraints are bound within a portfolio. If you apply template constraints to a product in one portfolio, and if you then include the product in another portfolio, the constraints will not apply to the product in the second portfolio.

If you apply a template constraint to a product that has already been shared with users, the constraint is active immediately for all subxsequent product launches and for all versions of the product in the portfolio.

You define template constraint rules by using a rule editor or by writing the rules as JSON text in the AWS Service Catalog administrator console. For more information about rules, including syntax and examples, see Template Constraint Rules (p. 33).

To test a constraint prior to releasing it to users, create a test portfolio that contains the same products and test the constraints with that portfolio.

To apply template constraints to a product

1. Sign in to the AWS Management Console and open the AWS Service Catalog console at https://console.aws.amazon.com/servicecatalog/.
2. On the **Portfolios** page, choose the portfolio that contains the product to which you want to apply a template constraint.
3. Expand the **Constraints** section and choose **Add constraints**.
4. In the **Select product and type** window, for **Product** choose the product for which you want to define the template constraints. Then, for **Constraint type**, choose **Template**. Choose **Continue**.
5. On the **Template constraint builder** page, edit the constraint rules by using the JSON editor or the rule builder interface.

   - To edit the JSON code for the rule, choose the **Constraint Text Editor** tab. Several samples are provided on this tab to help you get started.

     To build the rules by using a rule builder interface, choose the **Rule Builder** tab. On this tab, you can choose any parameter that is specified in the template for the product, and you can specify the allowable values for that parameter. Depending on the type of parameter, you specify the allowable values by choosing items in a checklist, by specifying a number, or by specifying a set of values in a comma-separated list.

     When you have finished building a rule, click **Add rule**. The rule appears in the table on the **Rule Builder** tab. To review and edit the JSON output, choose the **Constraint Text Editor** tab.
6. When you are done editing the rules for your constraint, choose **Submit**. To see the constraint, go to the portfolio details page, and expand the **Constraints** section.

Template Constraint Rules

The `Rules` that define template constraints in an AWS Service Catalog portfolio describe when end users can use the template and which values they can specify for parameters that are declared in the AWS CloudFormation template used to create the product they are attempting to use. Rules are useful for preventing end users from inadvertently specifying an incorrect value. For example, you can add a rule to verify whether end users specified a valid subnet in a given VPC or used `m1.small` instance types for test environments. AWS CloudFormation uses rules to validate parameter values before it creates the resources for the product.

Each rule consists of two properties: a rule condition (optional) and assertions (required). The rule condition determines when a rule takes effect. The assertions describe what values users can specify for a particular parameter. If you don't define a rule condition, the rule's assertions always take effect. To define a rule condition and assertions, you use *rule-specific intrinsic functions*, which are functions that can only be used in the `Rules` section of a template. You can nest functions, but the final result of a rule condition or assertion must be either true or false.

As an example, assume that you declared a VPC and a subnet parameter in the `Parameters` section. You can create a rule that validates that a given subnet is in a particular VPC. So when a user specifies a VPC, AWS CloudFormation evaluates the assertion to check whether the subnet parameter value is in that VPC

before creating or updating the stack. If the parameter value is invalid, AWS CloudFormation immediately fail to create or update the stack. If users don't specify a VPC, AWS CloudFormation doesn't check the subnet parameter value.

Syntax

The `Rules` section of a template consists of the key name `Rules`, followed by a single colon. Braces enclose all rule declarations. If you declare multiple rules, they are delimited by commas. For each rule, you declare a logical name in quotation marks followed by a colon and braces that enclose the rule condition and assertions.

A rule can include a `RuleCondition` property and must include an `Assertions` property. For each rule, you can define only one rule condition; you can define one or more asserts within the `Assertions` property. You define a rule condition and assertions by using rule-specific intrinsic functions, as shown in the following pseudo template:

```
"Rules" : {
  "Rule01" : {
    "RuleCondition" : { Rule-specific intrinsic function },
    "Assertions" : [
      {
        "Assert" : { Rule-specific intrinsic function },
        "AssertDescription" : "Information about this assert"
      },
      {
        "Assert" : { Rule-specific intrinsic function },
        "AssertDescription" : "Information about this assert"
      }
    ]
  },
  "Rule02" : {
    "Assertions" : [
      {
        "Assert" : { Rule-specific intrinsic function },
        "AssertDescription" : "Information about this assert"
      }
    ]
  }
}
```

The pseudo template shows a `Rules` section containing two rules named `Rule01` and `Rule02`. `Rule01` includes a rule condition and two assertions. If the function in the rule condition evaluates to true, both functions in each assert are evaluated and applied. If the rule condition is false, the rule doesn't take effect. `Rule02` always takes effect because it doesn't have a rule condition, which means the one assert is always evaluated and applied.

You can use the following rule-specific intrinsic functions to define rule conditions and assertions:

- `Fn::And`
- `Fn::Contains`
- `Fn::EachMemberEquals`
- `Fn::EachMemberIn`
- `Fn::Equals`
- `Fn::If`
- `Fn::Not`
- `Fn::Or`
- `Fn::RefAll`
- `Fn::ValueOf`

- `Fn::ValueOfAll`

Example

Conditionally Verify a Parameter Value

The following two rules check the value of the `InstanceType` parameter. Depending on the value of the Environment parameter (`test` or `prod`), the user must specify `m1.small` or `m1.large` for the `InstanceType` parameter. The `InstanceType` and `Environment` parameters must be declared in the `Parameters` section of the same template.

```
"Rules" : {
  "testInstanceType" : {
    "RuleCondition" : {"Fn::Equals":[{"Ref":"Environment"}, "test"]},
    "Assertions" : [
      {
        "Assert" :  { "Fn::Contains" : [ ["m1.small"], {"Ref" : "InstanceType"} ] },
        "AssertDescription" : "For the test environment, the instance type must be
 m1.small"
      }
    ]
  },
  "prodInstanceType" : {
    "RuleCondition" : {"Fn::Equals":[{"Ref":"Environment"}, "prod"]},
    "Assertions" : [
      {
        "Assert" :  { "Fn::Contains" : [ ["m1.large"], {"Ref" : "InstanceType"} ] },
        "AssertDescription" : "For the prod environment, the instance type must be
 m1.large"
      }
    ]
  }
}
```

Rule Functions

In the condition or assertions of a rule, you can use intrinsic functions, such as `Fn::Equals`, `Fn::Not`, and `Fn::RefAll`. The condition property determines if AWS CloudFormation applies the assertions. If the condition evaluates to `true`, AWS CloudFormation evaluates the assertions to verify whether a parameter value is valid when a provisioned product is created or updated. If a parameter values is invalid, AWS CloudFormation does not create or update the stack. If the condition evaluates to `false`, AWS CloudFormation doesn't check the parameter value and proceeds with the stack operation.

Topics

- Supported Attributes (p. 40)

Fn::And

Returns `true` if all the specified conditions evaluate to `true`; returns `false` if any one of the conditions evaluates to `false`. `Fn::And` acts as an AND operator. The minimum number of conditions that you can include is two, and the maximum is ten.

Declaration

```
"Fn::And": [{condition}, {...}]
```

Parameters

`condition`

A rule-specific intrinsic function that evaluates to `true` or `false`.

Example

The following example evaluates to `true` if the referenced security group name is equal to `sg-mysggroup` and if the `InstanceType` parameter value is either `m1.large` or `m1.small`:

```
"Fn::And" : [
  {"Fn::Equals" : ["sg-mysggroup", {"Ref" : "ASecurityGroup"}]},
  {"Fn::Contains" : [["m1.large", "m1.small"], {"Ref" : "InstanceType"}]}
]
```

Fn::Contains

Returns `true` if a specified string matches at least one value in a list of strings.

Declaration

```
"Fn::Contains" : [[list_of_strings], string]
```

Parameters

list_of_strings

A list of strings, such as `"A", "B", "C"`.

string

A string, such as `"A"`, that you want to compare against a list of strings.

Example

The following function evaluates to `true` if the `InstanceType` parameter value is contained in the list (`m1.large` or `m1.small`):

```
"Fn::Contains" : [
  ["m1.large", "m1.small"], {"Ref" : "InstanceType"}
]
```

Fn::EachMemberEquals

Returns `true` if a specified string matches all values in a list of strings.

Declaration

```
"Fn::EachMemberEquals" : [[list_of_strings], string]
```

Parameters

list_of_strings

A list of strings, such as `"A", "B", "C"`.

string

A string, such as `"A"`, that you want to compare against a list of strings.

Example

The following function returns `true` if the `Department` tag for all parameters of type AWS::EC2::VPC::Id have a value of `IT`:

```
"Fn::EachMemberEquals" : [
  {"Fn::ValueOfAll" : ["AWS::EC2::VPC::Id", "Tags.Department"]}, "IT"
]
```

Fn::EachMemberIn

Returns `true` if each member in a list of strings matches at least one value in a second list of strings.

Declaration

```
"Fn::EachMemberIn" : [[strings_to_check], strings_to_match]
```

Parameters

strings_to_check

A list of strings, such as `"A", "B", "C"`. AWS CloudFormation checks whether each member in the `strings_to_check` parameter is in the `strings_to_match` parameter.

strings_to_match

A list of strings, such as `"A", "B", "C"`. Each member in the `strings_to_match` parameter is compared against the members of the `strings_to_check` parameter.

Example

The following function checks whether users specify a subnet that is in a valid virtual private cloud (VPC). The VPC must be in the account and the region in which users are working with the stack. The function applies to all parameters of type AWS::EC2::Subnet::Id.

```
"Fn::EachMemberIn" : [
  {"Fn::ValueOfAll" : ["AWS::EC2::Subnet::Id", "VpcId"]}, {"Fn::RefAll" :
 "AWS::EC2::VPC::Id"}
```

```
]
```

Fn::Equals

Compares two values to determine whether they are equal. Returns `true` if the two values are equal and `false` if they aren't.

Declaration

```
"Fn::Equals" : ["value_1", "value_2"]
```

Parameters

`value`

A value of any type that you want to compare with another value.

Example

The following example evaluates to `true` if the value for the `EnvironmentType` parameter is equal to `prod`:

```
"Fn::Equals" : [{"Ref" : "EnvironmentType"}, "prod"]
```

Fn::Not

Returns `true` for a condition that evaluates to `false`, and returns `false` for a condition that evaluates to `true`. `Fn::Not` acts as a NOT operator.

Declaration

```
"Fn::Not": [{condition}]
```

Parameters

`condition`

A rule-specific intrinsic function that evaluates to `true` or `false`.

Example

The following example evaluates to `true` if the value for the `EnvironmentType` parameter is not equal to `prod`:

```
"Fn::Not" : [{"Fn::Equals" : [{"Ref" : "EnvironmentType"}, "prod"]}]
```

Fn::Or

Returns `true` if any one of the specified conditions evaluates to `true`; returns `false` if all of the conditions evaluate to `false`. `Fn::Or` acts as an OR operator. The minimum number of conditions that you can include is two, and the maximum is ten.

Declaration

```
"Fn::Or": [{condition}, {...}]
```

Parameters

`condition`

A rule-specific intrinsic function that evaluates to `true` or `false`.

Example

The following example evaluates to `true` if the referenced security group name is equal to `sg-mysggroup` or if the `InstanceType` parameter value is either `m1.large` or `m1.small`:

```
"Fn::Or" : [
  {"Fn::Equals" : ["sg-mysggroup", {"Ref" : "ASecurityGroup"}]},
  {"Fn::Contains" : [["m1.large", "m1.small"], {"Ref" : "InstanceType"}]}
]
```

Fn::RefAll

Returns all values for a specified parameter type.

Declaration

```
"Fn::RefAll" : "parameter_type"
```

Parameters

parameter_type

An AWS-specific parameter type, such as AWS::EC2::SecurityGroup::Id or AWS::EC2::VPC::Id. For more information, see Parameters in the *AWS CloudFormation User Guide*.

Example

The following function returns a list of all VPC IDs for the region and AWS account in which the stack is being created or updated:

```
"Fn::RefAll" : "AWS::EC2::VPC::Id"
```

Fn::ValueOf

Returns an attribute value or list of values for a specific parameter and attribute.

Declaration

```
"Fn::ValueOf" : [ "parameter_logical_id", "attribute" ]
```

Parameters

attribute

The name of an attribute from which you want to retrieve a value. For more information about attributes, see Supported Attributes (p. 40).

parameter_logical_id

The name of a parameter for which you want to retrieve attribute values. The parameter must be declared in the `Parameters` section of the template.

Examples

The following example returns the value of the `Department` tag for the VPC that is specified by the `ElbVpc` parameter:

```
"Fn::ValueOf" : ["ElbVpc", "Tags.Department"]
```

If you specify multiple values for a parameter, the Fn::ValueOf function can return a list. For example, you can specify multiple subnets and get a list of Availability Zones where each member is the Avalibility Zone of a particular subnet:

```
"Fn::ValueOf" : ["ListOfElbSubnets", "AvailabilityZone"]
```

Fn::ValueOfAll

Returns a list of all attribute values for a given parameter type and attribute.

Declaration

```
"Fn::ValueOfAll" : ["parameter_type", "attribute"]
```

Parameters

attribute

The name of an attribute from which you want to retrieve a value. For more information about attributes, see Supported Attributes (p. 40).

parameter_type

An AWS-specific parameter type, such as AWS::EC2::SecurityGroup::Id or AWS::EC2::VPC::Id. For more information, see Parameters in the *AWS CloudFormation User Guide*.

Example

In the following example, the `Fn::ValueOfAll` function returns a list of values, where each member is the `Department` tag value for VPCs with that tag:

```
"Fn::ValueOfAll" : ["AWS::EC2::VPC::Id", "Tags.Department"]
```

Supported Functions

You cannot use another function within the `Fn::ValueOf` and `Fn::ValueOfAll` functions. However, you can use the following functions within all other rule-specific intrinsic functions:

- `Ref`
- Other rule-specific intrinsic functions

Supported Attributes

The following list describes the attribute values that you can retrieve for specific resources and parameter types:

The AWS::EC2::VPC::Id parameter type or VPC IDs

- DefaultNetworkAcl

- DefaultSecurityGroup
- Tags.*tag_key*

The AWS::EC2::Subnet::Id parameter type or subnet IDs

- AvailabilityZone
- Tags.*tag_key*
- VpcId

The AWS::EC2::SecurityGroup::Id parameter type or security group IDs

- Tags.*tag_key*

Managing Catalogs

AWS Service Catalog provides an interface for managing portfolios, products, and constraints from an administrator console.

> **Note**
> To perform any of the tasks in this section, you must have administrator permissions for AWS Service Catalog. For more information, see Controlling Access Using Service-level Permissions (p. 25).

To access the AWS Service Catalog administrator's console, log in to the AWS Management Console and navigate to https://console.aws.amazon.com/servicecatalog/. The first time you access the administrator's console, you are prompted to create a portfolio. Follow the instructions to create your first portfolio, and then proceed to the **Portfolios** page.

Topics

Working With Portfolios

You create, view, and update portfolios on the **Portfolios** page in the AWS Service Catalog administrator console.

Creating, Viewing, and Deleting Portfolios

The **Portfolios** page displays a list of the portfolios that you have created in the current region. Use this page to create new portfolios, view a portfolio's details, or delete portfolios from your account.

To view the Portfolios page

1. Sign in to the AWS Management Console and go to AWS Service Catalog at https://console.aws.amazon.com/servicecatalog/#/portfolios.
2. Select a different region as necessary.

While using AWS Service Catalog, you can return to the **Portfolios** page at any time by choosing **Service Catalog** in the navigation bar, and then choosing **Portfolios**.

Managing Portfolio Details

In the AWS Service Catalog administrator console the **Portfolio details** page lists all of the settings for a portfolio. Use this page to manage the products in the portfolio, grant users access to products, and apply tags and constraints.

To view the Portfolio details page

1. Sign in to the AWS Management Console and go to AWS Service Catalog at https://console.aws.amazon.com/servicecatalog/.
2. Choose the portfolio that you want to manage.

Creating and Deleting Portfolios

Use the **Portfolios** page to create and delete portfolios. Deleting a portfolio removes it from your account. Before you can delete a portfolio, you must remove all the products, constraints, and users that it contains.

To create a new portfolio

1. Navigate to the **Portfolios** page.
2. Choose **Create portfolio**.
3. On the **Create portfolio** page, enter the requested information.
4. Choose **Create**. AWS Service Catalog creates the portfolio and displays the portfolio details.

To delete a portfolio

1. Navigate to the **Portfolios** page.
2. Select the portfolio by clicking the corresponding radio button or anywhere on the listing except on the portfolio title.
3. Choose **Delete portfolio**.
4. Choose **Continue**.

Adding Products

To add products to a portfolio, you either create a new product or add an existing product from your catalog to the portfolio.

> **Note**
> The AWS CloudFormation template that you upload when you create an AWS Service Catalog product is stored in an Amazon Simple Storage Service (Amazon S3) bucket that starts with `cf-templates-` in your AWS account. Do not delete these files unless you are sure that they are no longer in use.

Adding a New Product

You add new products directly from the portfolio details page. When you create a product from this page, AWS Service Catalog adds it to the currently selected portfolio. You can also add a product to other portfolios.

To add a new product

1. Navigate to the **Portfolios** page, and then choose the name of the portfolio to which you want to add the product.
2. On the portfolio details page, expand the **Products** section, and then choose **Upload new product**.
3. For **Enter product details**, enter the following:

   - **Product name** – The name of the product.
   - **Short description** – The short description. This description appears in search results to help the user choose the correct product.
   - **Description** – The full description. This description is shown in the product listing to help the user choose the correct product.
   - **Provided by** – The name or email address of your IT department or administrator.
   - **Vendor** (optional) – The name of the application's publisher. This field allows users to sort their products list to makes it easier to find the products that they need.

   Choose **Next**.
4. For **Enter support details**, enter the following:

   - **Email contact** (optional) – The email address for reporting issues with the product.
   - **Support link** (optional) – A URL to a site where users can find support information or file tickets. The URL must begin with `http://` or `https://`.
   - **Support description** (optional) – A description of how users should use the **Email contact** and **Support link**.

   Choose **Next**.
5. On the **Version details** page, enter the following:

   - **Select template** – An AWS CloudFormation template from a local drive or a URL that points to a template stored in Amazon S3. If you specify an Amazon S3 URL, it must begin with `https://`. The extension for the template file must be `.template`.
   - **Version title** – the name of the product version (e.g., "v1", "v2beta"). No spaces are allowed.
   - **Description** (optional) – A description of the product version including how this version differs from the previous version.

   Choose **Next**.
6. On the **Review** page, verify that the information is correct, and then choose **Confirm and upload**. After a few seconds, the product appears in your portfolio. You might need to refresh your browser to see the product.

Adding an Existing Product

You can add existing products to a portfolio from three places: the **Portfolios** list, the portfolio details page, or the **Products** page.

To add an existing product to a portfolio

1. Navigate to the **Portfolios** page.
2. Choose a portfolio, and then choose **Add product**.
3. Choose a product, and then choose **Add product to portfolio**.

Removing a Product from a Portfolio

When you no longer want users to use a product, remove it from a portfolio. The product is still available in your catalog from the **Products** page, and you can still add it to other portfolios. You can remove multiple products from a portfolio at one time.

To remove a product from a portfolio

1. Navigate to the **Portfolios** page, and then choose the portfolio that contains the product. The portfolio details page opens.
2. Expand the **Products** section.
3. Choose one or more products, and then choose **Remove product**.
4. Choose **Continue**.

Adding Constraints

To control how users are able to use products, add constraints. For more information about the types of constraints that AWS Service Catalog supports, see Using Constraints (p. 30).

You add constraints to products after they have been placed in a portfolio.

To add a constraint to a product

1. Sign in to the AWS Management Console and open the AWS Service Catalog console at https://console.aws.amazon.com/servicecatalog/.
2. Choose **Portfolios** and select a portfolio.
3. In the portfolio details page, expand the **Constraints** section and choose **Add constraints**.
4. For **Product**, select the product to which to apply the constraint.
5. For **Constraint type**, choose one of the following options:

   - **Launch** – The IAM role that AWS Service Catalog uses to launch and manage the product.
   - **Template** – A JSON–formatted text file that contains one or more rules. Rules are added to the AWS CloudFormation template used by the product. For more information, see Template Constraint Rules (p. 33).
6. Choose **Continue**.

To edit a constraint

1. Sign in to the AWS Management Console and open the AWS Service Catalog administrator console at https://console.aws.amazon.com/catalog/.
2. Choose **Portfolios** and select a portfolio.
3. In the portfolio details page, expand the **Constraints** section and select the constraint to edit.
4. Choose **Edit constraints**.
5. Edit the constraint as needed, and choose **Submit**.

Tagging Portfolios

You can assign tags to portfolios to track products that are launched from that portfolio. When you add a tag to a portfolio, the tag is applied to all products launched from that portfolio. Tags are applied to all resources that are created when a product is launched. You can assign a maximum of three tags to a portfolio. For more information, see Tagging Resources (p. 54).

To add tags to a portfolio

1. Navigate to the **Portfolios** page, and then choose the portfolio.
2. On the portfolio details page, expand the **Tags** section.
3. Type a key and value for the tag.
4. Choose **Add tag**.

To delete a tag, choose the check box next to its key, and then choose **Delete tag**. Deleted tags are no longer applied to new provisioned products when they launch, but remain on resources that have already been launched.

Granting Access to Users

Give users access to portfolios by using IAM users, groups, and roles. The best way to provide portfolio access for many users is to put the users in an IAM group and grant access to that group. That way you can simply add and remove users from the group to manage portfolio access. For more information, see IAM Users and Groups in the *Using IAM* guide.

In addition to access to a portfolio, IAM users must also have access to the AWS Service Catalog end user console. You grant access to the console by applying permissions in IAM. For more information, see Controlling Access Using Service-level Permissions (p. 25).

To grant portfolio access to users or groups

1. In the portfolio details page, expand the **Users, groups and roles** section, and then choose **Add user, group or role**.
2. Choose the **Groups**, **Users**, or **Roles** tab to add groups, users, or roles, respectively.
3. Choose one or more users, groups, or roles, and then choose **Add Access** to grant them access to the current portfolio.

   Tip
   To grant access to a combination of groups, users, and roles, you can switch between the tabs without losing your selection.

To remove access to a portfolio

1. On the portfolio details page, choose the checkbox for the user or group.
2. Choose **Remove user, group or role**.

Managing Products

You create products by packaging an AWS CloudFormation template with metadata, update products by creating a new version based on an updated template, and group products together into portfolios to distribute them to users.

New versions of products are propagated to all users who have access to the product through a portfolio. When you distribute an update, end users can update existing provisioned products with just a few clicks.

Displaying the Products Page

You manage products from the **Products** page in the AWS Service Catalog administrator console.

To view the Products page

1. Sign in to the AWS Management Console, and then navigate to https://console.aws.amazon.com/servicecatalog/.
2. Choose **Service Catalog** in the navigation bar.
3. Choose **Products**.

Creating Products

To create a new AWS Service Catalog product

1. Navigate to the **Products** page.
2. Choose **Upload new product**.
3. For **Enter product details**, enter the following:

   - **Product name** – The name of the product.
   - **Short description** – The short description. This description appears in search results to help the user choose the correct product.
   - **Description** – The full description. This description is shown in the product listing to help the user choose the correct product.
   - **Provided by** – The name of your IT department or administrator.
   - **Vendor** (optional) – The name of the application's publisher. This field allows users to sort their products list to makes it easier to find the products that they need.

   Choose **Next**.
4. For **Enter support details**, enter the following:

   - **Email contact** (optional) – The email address for reporting issues with the product.
   - **Support link** (optional) – A URL to a site where users can find support information or file tickets. The URL must begin with `http://` or `https://`.
   - **Support description** (optional) – A description of how users should use the **Email contact** and **Support link**.

   Choose **Next**.
5. For **Version details**, enter the following:

   - **Select template** – An AWS CloudFormation template from a local drive or a URL that points to a template stored in Amazon S3. If you specify an Amazon S3 URL, it must begin with `https://`. The extension for the template file must be `.template`.
   - **Version title** – the name of the product version (e.g., "v1", "v2beta"). No spaces are allowed.
   - **Description** (optional) – A description of the product version including how this version differs from the previous version.
6. Choose **Next**.

7. On the **Review** page, verify that the information is correct, and then choose **Confirm and upload**. After a few seconds, the product appears on the **Products** page. You might need to refresh your browser to see the product.

Adding Products to Portfolios

You can add products in any number of portfolios. When a product is updated, all of the portfolios that contain the product automatically receive the new version, including shared portfolios.

To add a product from your catalog to a portfolio

1. Navigate to the **Products** page.
2. Choose a product, choose **Actions**, and then choose **Add product to portfolio**.
3. Choose a portfolio, and then choose **Add product to portfolio**.

Updating Products

When you need to update a product's AWS CloudFormationtemplate, you create a new version of your product. A new product version is automatically available to all users who have access to a portfolio that contains the product.

Users who are currently running a provisioned product of the previous version of the product can update their provisioned product using the end user console view. When a new version of a product is available, users can use the **Update provisioned product** command on either the **Provisioned product list** or **Provisioned product details** pages.

> **Note**
> Before you create a new version of a product, test your product updates in AWS CloudFormation to ensure that they work.

To create a new product version

1. Navigate to the **Products** page.
2. Choose the product name.
3. On the product details page, expand the **Versions** section, and then choose **Create new version**.
4. For **Version details**, enter the following:

   - **Select template** – An AWS CloudFormation template from a local drive or a URL that points to a template stored in Amazon S3. If you specify an Amazon S3 URL, it must begin with `https://`. The extension for the template file must be `.template` and can be either JSON– or YAML-formatted text files. For more information, see Template Formats in the *AWS CloudFormation User Guide*.
   - **Version title** – the name of the product version (e.g., "v1", "v2beta"). No spaces are allowed.
   - **Description** (optional) – A description of the product version including how this version differs from the previous version.

   Choose **Save**.

Tagging Products

You can assign tags to products to track products that are launched. When you add a tag to a product, the tag is applied to the launched product. Tags are applied to all resources that are created when a product

is launched. You can assign a maximum of three tags to a product. For more information, see Tagging Resources (p. 54).

To add tags to a product

1. Navigate to the **Products** page, and then choose the product.
2. On the product details page, expand the **Tags** section.
3. Type a key and value for the tag.
4. Choose **Add tag**.

To delete a tag, choose the check box next to its key, and then choose **Delete tag**. Deleted tags are no longer applied to new provisioned products when they launch, but remain on resources that have already been launched.

Deleting Products

To remove products from your account completely, delete them from your catalog. Deleting a product removes all versions of the product from every portfolio that contains the product. Deleted products cannot be recovered.

To delete a product from your catalog

1. Navigate to the **Products** page.
2. Choose the product, choose **Actions**, and then choose **Delete product**.
3. Verify that you have chosen the product that you want to delete, and then choose **Continue**.

Adding an AWS Marketplace Product to Your Portfolio

You can add AWS Marketplace products to your portfolios to make those products available to your AWS Service Catalog end users.

AWS Marketplace is an online store in which you can find, subscribe to, and immediately start using a large selection of software and services. The types of products in AWS Marketplace include databases, application servers, testing tools, monitoring tools, content management tools, and business intelligence software. AWS Marketplace is available at https://aws.amazon.com/marketplace.

You distribute an AWS Marketplace product to AWS Service Catalog end users by defining the product in an AWS CloudFormation template and adding the template to a portfolio. Any end user who has access to the portfolio will be able to launch the product from the console.

Complete the following steps to subscribe to an AWS Marketplace product, define that product in an AWS CloudFormation template, and add the template to an AWS Service Catalog portfolio.

To subscribe to an AWS Marketplace product

1. Go to AWS Marketplace at https://aws.amazon.com/marketplace.
2. Browse the products or search to find the product that you want to add to your AWS Service Catalog portfolio. Choose the product to view the product details page.
3. Choose **Continue** to view the fulfillment page, and then choose the **Manual Launch** tab.

The information on the fulfillment page includes the supported Amazon Elastic Compute Cloud (Amazon EC2) instance types, the supported AWS regions, and the Amazon Machine Image (AMI) ID that the product uses for each AWS region. Note that some choices will affect cost. You will use this information to customize the AWS CloudFormation template in later steps.

4. Choose **Accept Terms** to subscribe to the product.

   After you subscribe to a product, you can access the information on the product fulfillment page in AWS Marketplace at any time by choosing **Your Software**, and then choosing the product.

To define your AWS Marketplace product in an AWS CloudFormation template

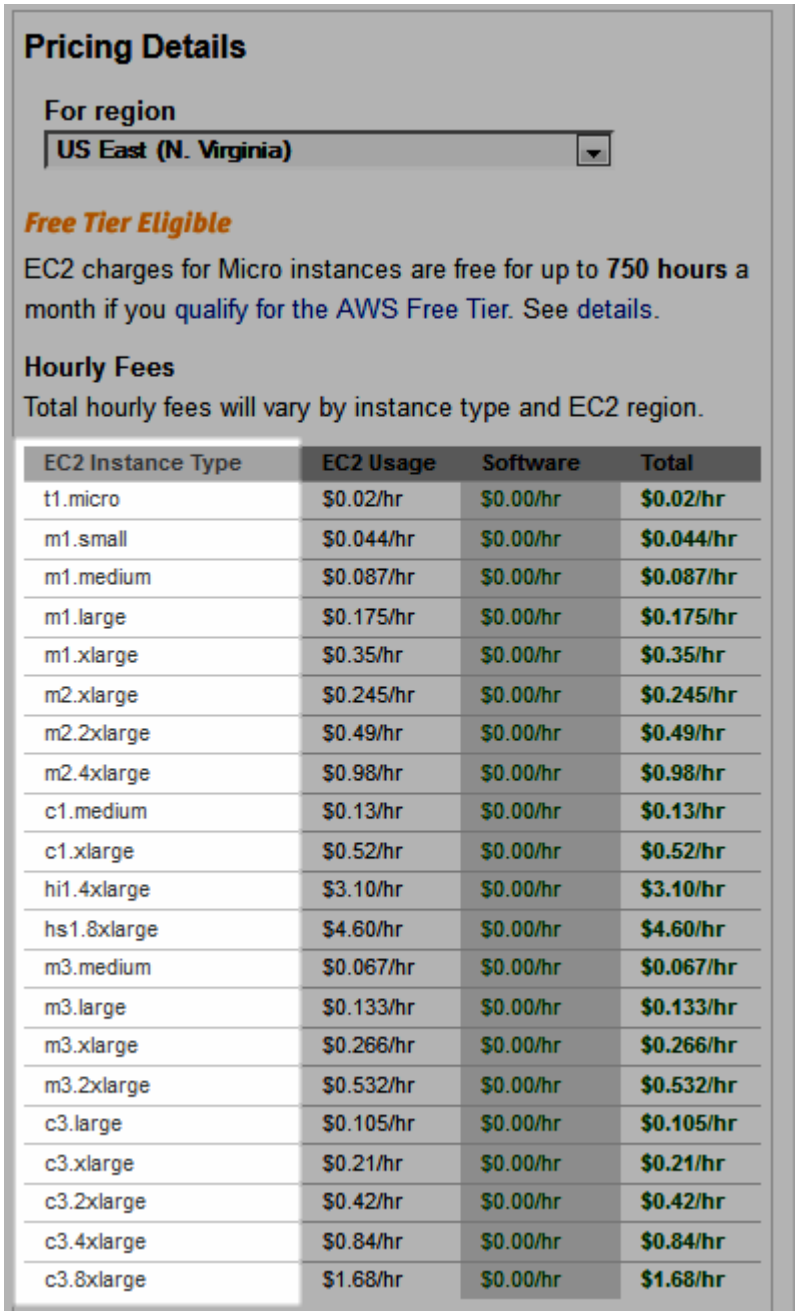
To complete the following steps, you will use one of the AWS CloudFormation sample templates as a starting point, and you will customize the template so that it represents your AWS Marketplace product. To access the sample templates, see Sample Templates in the *AWS CloudFormation User Guide*.

1. On the Sample Templates page in the *AWS CloudFormation User Guide*, choose a region that your product will be used in. The region must be supported by your AWS Marketplace product. You can view the supported regions on the product fulfillment page in AWS Marketplace.
2. To view a list of service sample templates that are appropriate for the region, choose the **Services** link.
3. You can use any of the samples that are appropriate for your needs as a starting point. The steps in this procedure use the **Amazon EC2 instance in a security group** template. To view the sample template, choose **View** , and then save a copy of the template locally so that you can edit it. Your local file must have the `.template` extension.
4. Open your template file in a text editor.
5. Customize the description at the top of the template. Your description might look like the following example:

   ```
   "Description": "Launches a LAMP stack from AWS Marketplace",
   ```

6. Customize the `InstanceType` parameter so that it includes only EC2 instance types that are supported by your product. If your template includes unsupported EC2 instance types, the product will fail to launch for your end users.

   a. On the product fulfillment page in AWS Marketplace, view the supported EC2 instance types in the **Pricing Details** section, as in the following example:



Pricing Details

For region

US East (N. Virginia)

Free Tier Eligible

EC2 charges for Micro instances are free for up to **750 hours** a month if you qualify for the AWS Free Tier. See details.

Hourly Fees

Total hourly fees will vary by instance type and EC2 region.

EC2 Instance Type	EC2 Usage	Software	Total
t1.micro	$0.02/hr	$0.00/hr	$0.02/hr
m1.small	$0.044/hr	$0.00/hr	$0.044/hr
m1.medium	$0.087/hr	$0.00/hr	$0.087/hr
m1.large	$0.175/hr	$0.00/hr	$0.175/hr
m1.xlarge	$0.35/hr	$0.00/hr	$0.35/hr
m2.xlarge	$0.245/hr	$0.00/hr	$0.245/hr
m2.2xlarge	$0.49/hr	$0.00/hr	$0.49/hr
m2.4xlarge	$0.98/hr	$0.00/hr	$0.98/hr
c1.medium	$0.13/hr	$0.00/hr	$0.13/hr
c1.xlarge	$0.52/hr	$0.00/hr	$0.52/hr
hi1.4xlarge	$3.10/hr	$0.00/hr	$3.10/hr
hs1.8xlarge	$4.60/hr	$0.00/hr	$4.60/hr
m3.medium	$0.067/hr	$0.00/hr	$0.067/hr
m3.large	$0.133/hr	$0.00/hr	$0.133/hr
m3.xlarge	$0.266/hr	$0.00/hr	$0.266/hr
m3.2xlarge	$0.532/hr	$0.00/hr	$0.532/hr
c3.large	$0.105/hr	$0.00/hr	$0.105/hr
c3.xlarge	$0.21/hr	$0.00/hr	$0.21/hr
c3.2xlarge	$0.42/hr	$0.00/hr	$0.42/hr
c3.4xlarge	$0.84/hr	$0.00/hr	$0.84/hr
c3.8xlarge	$1.68/hr	$0.00/hr	$1.68/hr

b. In your template, change the default instance type to a supported EC2 instance type of your choice.

c. Edit the `AllowedValues` list so that it includes only EC2 instance types that are supported by your product.

d. Remove any EC2 instance types that you do not want your end users to use when they launch the product from the `AllowedValues`list .

When you are done editing the `InstanceType` parameter, it might look similar to the following example:

```
    "InstanceType" : {
```

```
      "Description" : "EC2 instance type",
      "Type" : "String",
      "Default" : "m1.small",
      "AllowedValues" : [ "t1.micro", "m1.small", "m1.medium", "m1.large", "m1.xlarge",
 "m2.xlarge", "m2.2xlarge", "m2.4xlarge", "c1.medium", "c1.xlarge", "c3.large",
 "c3.large", "c3.xlarge", "c3.xlarge", "c3.4xlarge", "c3.8xlarge" ],
      "ConstraintDescription" : "Must be a valid EC2 instance type."
    },
```

7. In the `Mappings` section of your template, edit the `AWSInstanceType2Arch` mappings so that only supported EC2 instance types and architectures are included.

   a. Edit the list of mappings by removing all EC2 instance types that are not included in the `AllowedValues` list for the `InstanceType` parameter.

   b. Edit the `Arch` value for each EC2 instance type to be the architecture type that is supported by your product. Valid values are `PV64`, `HVM64`, and `HVMG2`. To learn which architecture your product supports, refer to the product details page in AWS Marketplace. To learn which architectures are supported by EC2 instance families, see Amazon Linux AMI Instance Type Matrix.

   When you have finished editing the `AWSInstanceType2Arch` mappings, it might look similar to the following example:

```
    "AWSInstanceType2Arch" : {
      "t1.micro"    : { "Arch" : "PV64"  },
      "m1.small"    : { "Arch" : "PV64"  },
      "m1.medium"   : { "Arch" : "PV64"  },
      "m1.large"    : { "Arch" : "PV64"  },
      "m1.xlarge"   : { "Arch" : "PV64"  },
      "m2.xlarge"   : { "Arch" : "PV64"  },
      "m2.2xlarge"  : { "Arch" : "PV64"  },
      "m2.4xlarge"  : { "Arch" : "PV64"  },
      "c1.medium"   : { "Arch" : "PV64"  },
      "c1.xlarge"   : { "Arch" : "PV64"  },
      "c3.large"    : { "Arch" : "PV64"  },
      "c3.xlarge"   : { "Arch" : "PV64"  },
      "c3.2xlarge"  : { "Arch" : "PV64"  },
      "c3.4xlarge"  : { "Arch" : "PV64"  },
      "c3.8xlarge"  : { "Arch" : "PV64"  }
    }
,
```

8. In the `Mappings` section of your template, edit the `AWSRegionArch2AMI` mappings to associate each AWS region with the corresponding architecture and AMI ID for your product.

   a. On the product fulfillment page in AWS Marketplace, view the AMI ID that your product uses for each AWS region, as in the following example:

Region	ID	
US East (N. Virginia)	ami-	Launch with EC2 Console
US West (Oregon)	ami-	Launch with EC2 Console
US West (N. California)	ami-	Launch with EC2 Console
EU (Frankfurt)	ami-	Launch with EC2 Console
EU (Ireland)	ami-	Launch with EC2 Console
Asia Pacific (Singapore)	ami-	Launch with EC2 Console
Asia Pacific (Sydney)	ami-	Launch with EC2 Console
Asia Pacific (Tokyo)	ami-	Launch with EC2 Console
South America (Sao Paulo)	ami-	Launch with EC2 Console

b. In your template, remove the mappings for any regions that you do not support.

c. Edit the mapping for each region to remove the unsupported architectures (`PV64`, `HVM64`, or `HVMG2`) and their associated AMI IDs.

d. For each remaining region and architecture mapping, specify the corresponding AMI ID from the product details page in AWS Marketplace.

When you have finished editing the `AWSRegionArch2AMI` mappings, your code might look similar to the following example:

```
"AWSRegionArch2AMI" : {
  "us-east-1"        : {"PV64" : "ami-nnnnnnnn"},
  "us-west-2"        : {"PV64" : "ami-nnnnnnnn"},
  "us-west-1"        : {"PV64" : "ami-nnnnnnnn"},
  "eu-west-1"        : {"PV64" : "ami-nnnnnnnn"},
  "eu-central-1"     : {"PV64" : "ami-nnnnnnnn"},
  "ap-northeast-1"   : {"PV64" : "ami-nnnnnnnn"},
  "ap-southeast-1"   : {"PV64" : "ami-nnnnnnnn"},
  "ap-southeast-2"   : {"PV64" : "ami-nnnnnnnn"},
  "sa-east-1"        : {"PV64" : "ami-nnnnnnnn"}
}
```

You can now use the template to add the product to an AWS Service Catalog portfolio. If you want to make additional changes, see Working with AWS CloudFormation Templates to learn more about templates.

To add your AWS Marketplace product to an AWS Service Catalog portfolio

1. Sign in to the AWS Management Console and navigate to the AWS Service Catalog administrator console at https://console.aws.amazon.com/servicecatalog/.
2. On the **Portfolios** page, choose the portfolio that you want to add your AWS Marketplace product to.
3. On the portfolio details page, choose **Upload new product**.
4. Type the requested product and support details.
5. On the **Version details** page, choose **Upload a template file**, choose **Browse**, and then choose your template file.
6. Type a version title and description.
7. Choose **Next**.

8. On the **Review** page, verify that the summary is accurate, and then choose **Confirm and upload**. The product is added your portfolio. It is now available to end users who have access to the portfolio.

Tagging Resources

Tags are words or phrases that act as metadata for identifying and organizing your AWS resources. Each resource can have up to ten tags, each of which consists of a key and a value. For more information about tagging, see What Is a Tag? in the *AWS Billing and Cost Management User Guide*.

You can add three tags to a portfolio and three tags to a product. When a product is launched, its tags and the tags of its portfolio are combined and applied to the provisioned product automatically. For a portfolio, you might add a `CostCenter` or `GroupName` tag for the group that the portfolio is distributed to. For a product, you could add a `ProductOwner`, `LicenseType`, or `OperatingSystem` tag to specify information about the product. For a list of

When end users launches a provisioned product, they can add tags to the provisioned product beyond those inherited from the product or portfolio. If you want your users to add specific tags, specify them in the product's description. For example, you may want the user to enter a `Name` tag for the provisioned product, or a `User` tag with their user name as the value.

Tags are assigned to provisioned product resources during product launch and cannot be changed when a provisioned product is updated or at any other time during a provisioned product's lifecycle.

> **Note**
> AWS CloudFormation also adds three tags (`stack name`, `stack ID`, and `logical ID`) to each cloud resource when it is created. These tags do not count toward tag limits.

For examples of using tags with various AWS products, see Applying Tags in the *AWS Billing and Cost Management User Guide*.

Tracking Costs Using Tags

The tags you add appear as columns in the Amazon Elastic Compute Cloud (Amazon EC2) console and are automatically added to the list of filters in the search bar. You can sort by tag to find the resources you are looking for.

You can also manage tags collectively using Tag Editor in the AWS Management Console. For more information, see Working with Tag Editor.

> **Tip**
> Add a tag with the **Name** key to name provisioned product resources at launch. The **Name** column is displayed by default in the Amazon EC2 console.

Portfolio Sharing

To make your AWS Service Catalog products available to users who are not in your AWS account, such as users who belong to other organizations or to other AWS accounts in your organization, you share your portfolios with their AWS accounts.

When you share a portfolio, you allow an AWS Service Catalog administrator of another AWS account to import your portfolio into his or her account and distribute the products to end users in that account. This *imported portfolio* isn't an independent copy. The products and constraints in the imported portfolio stay in sync with changes that you make to the *shared portfolio*, the original portfolio that you shared. The *recipient administrator*, the administrator with whom you share a portfolio, cannot change the products or constraints, but can add AWS Identity and Access Management (IAM) access for end users and add tags. For more information, see Granting Access to Users (p. 46) and Tagging Portfolios (p. 46).

The recipient administrator can distribute the products to end users who belong to his or her AWS account in the following ways:

- By adding IAM users, groups, and roles to the imported portfolio.
- By adding products from the imported portfolio to a *local portfolio*, a separate portfolio that the recipient administrator creates and that belongs to his or her AWS account. The recipient administrator then adds IAM users, groups, and roles to the local portfolio. The constraints that you applied to the products in the shared portfolio are also present in the local portfolio. The recipient administrator can add additional constraints to the local portfolio, but cannot remove the imported constraints.

When you add products or constraints to the shared portfolio or remove products or constraints from it, the change propagates to all imported instances of the portfolio. For example, if you remove a product from the shared portfolio, that product is also removed from the imported portfolio. It is also removed from all local portfolios that the imported product was added to. If an end user launched a product before you removed it, the end user's provisioned product continues to run, but the product becomes unavailable for future launches.

If you apply a launch constraint to a product in a shared portfolio, it propagates to all imported instances of the product. To override this launch constraint, the recipient administrator adds the product to a local portfolio and then applies a different launch constraint to it. The launch constraint that is in effect sets a launch role for the product. A *launch role* is an IAM role that AWS Service Catalog uses to provision AWS resources (such as EC2 instances or RDS databases) when an end user launches the product. This launch role is used even if the end user belongs to a different AWS account than the one that owns the launch role. For more information about launch constraints and launch roles, see Applying a Launch Constraint (p. 30). The AWS account that owns the launch role provisions the AWS resources, and this account incurs the usage charges for those resources. For more information, see AWS Service Catalog Pricing.

Note
You cannot re-share products from a portfolio that has been imported or shared.

Summary of Relationship Between Shared and Imported Portfolios

The following table summarizes the relationship between an imported portfolio and a shared portfolio and the actions that an administrator who imports a portfolio can and can't take with that portfolio and the products in it.

Elements of Shared Portfolio	Relationship with Imported Portfolio	What the Recipient Administrator Can Do	What the Recipient Administrator Cannot Do
Products and product versions	Inherited. If the portfolio creator adds products to or removes products from the shared portfolio, the change propagates to the imported portfolio.	Add imported products to local portfolios. Products stay in sync with shared portfolio.	Upload or add products to the imported portfolio or remove products from the imported portfolio.
Launch constraints	Inherited. If the portfolio creator adds launch constraints	In a local portfolio, the administrator can override the imported launch constraint by	Add launch constraints to or remove launch constraints from the imported portfolio.

Elements of Shared Portfolio	Relationship with Imported Portfolio	What the Recipient Administrator Can Do	What the Recipient Administrator Cannot Do
	to or removes launch constraints from a shared product, the change propagates to all imported instances of the product. If the recipient administrator adds an imported product to a local portfolio, the imported launch constraint that is applied to that product is present in the local portfolio.	applying a different one to the product.	
Template constraints	Inherited. If the portfolio creator adds a template constraint to or removes a template constraints from a shared product, the change propagates to all imported instances of the product. If the recipient administrator adds an imported product to a local portfolio, the imported template constraints that are applied to that product are inherited by the local portfolio.	In a local portfolio, the administrator can add template constraints that take effect in addition to the imported constraints.	Remove the imported template constraints.
IAM users, groups, and roles	Not inherited.	Add IAM users, groups, and roles that are in administrator's AWS account.	Not applicable.
Tags	Not inherited.	Add tags.	Not applicable.

Sharing a Portfolio

To enable an AWS Service Catalog administrator for another AWS account to distribute your products to end users, share your AWS Service Catalog portfolio with that administrator's AWS account.

To complete these steps, you must obtain the AWS Account ID of the target AWS account. The ID is provided on the **My Account** page in the AWS Management Console of the target account.

To share a portfolio

1. Sign in to the AWS Management Console and open the AWS Service Catalog console at https://console.aws.amazon.com/servicecatalog/.
2. On the **Portfolios** page, select the portfolio that you want to share, and choose **Share Portfolio**.
3. In the **Enter AWS account ID** window, type the account ID of the AWS account that you are sharing with. Then, choose **Share**. If sharing succeeds, a message on the **Portfolios** page confirms that the portfolio is linked with the target account. It also provides a URL that the recipient administrator must use to import the portfolio.
4. Send the URL to the AWS Service Catalog administrator of the target account. The URL opens the **Import Portfolio** page with the ARN of the shared portfolio automatically provided.

Importing a Portfolio

If an AWS Service Catalog administrator for another AWS account shares a portfolio with you, import that portfolio into your account so that you can distribute its products to your end users.

To import the portfolio, you must get a URL for importing the portfolio from the administrator, or you must get the Amazon Resource Name (ARN) of the shared portfolio. The ARN is provided on the details page of the shared portfolio in the administrator's account.

If you received the import URL

- Visit the URL, and on the **Import Portfolio** page, choose **Import**. The **Portfolios** page displays, and the portfolio is shown in the **Imported Portfolios** table.

If you received the portfolio ARN

1. Sign in to the AWS Management Console and open the AWS Service Catalog console at https://console.aws.amazon.com/servicecatalog/.
2. On the **Portfolios** page, choose **Import portfolio**.
3. On the **Import Portfolio** page, type the ARN of the portfolio in the text box.
4. Choose **Import**. The **Portfolios** page displays, and the portfolio is appears in the **Imported Portfolios** table.

Managing Provisioned Products

AWS Service Catalog provides an interface for managing provisioned products. You can view, update, and terminate all provisioned products for your catalog based on access level. Refer to the following sections for example procedures.

Topics

Managing All Provisioned Products as Administrator

To manage all provisioned products for the account, you will need **ServiceCatalogAdminFullAccess** or equivalent access to the provisioned product write operations. For more information, see Controlling Access Using Service-level Permissions (p. 25).

To view and manage all provisioned products

1. Sign in to the AWS Management Console and open the AWS Service Catalog console at https://console.aws.amazon.com/servicecatalog/.

   If you are already logged in to some other area of the AWS Service Catalog console, choose **Service Catalog**, **End user**.
2. If necessary, scroll down to the **Provisioned products** section.
3. In the **Provisioned products** section, choose the **View:** list and select the level of access you wish to see: **User**, **Role**, or **Account**. This displays all the provisioned products in the catalog.
4. Choose a provisioned product to view, update, or terminate. For more information about the information provided in this view, see Viewing Provisioned Product Information.

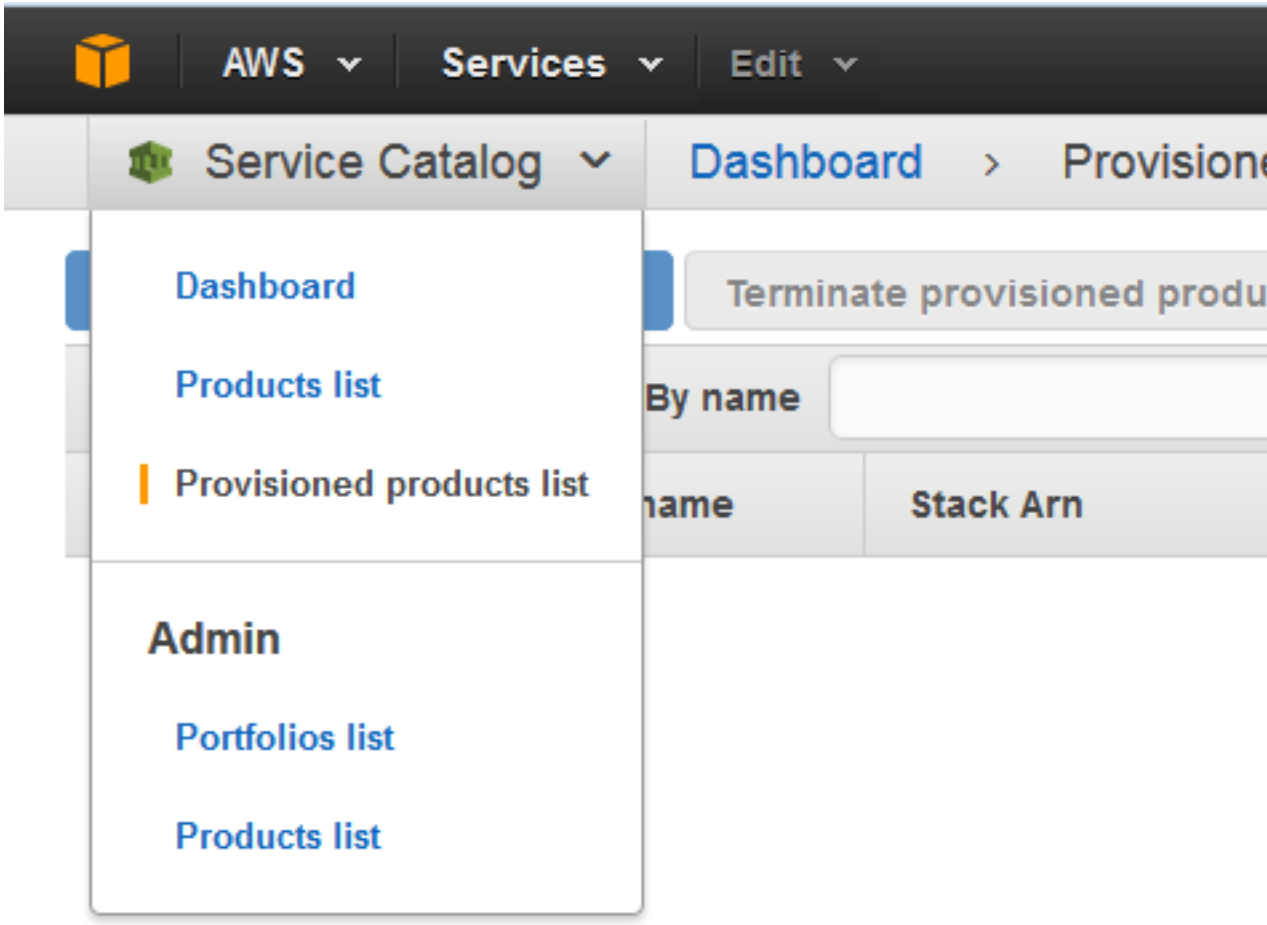
Tutorial: Identifying User Resource Allocation

You can identify the user who provisioned a product and resources associated with the product using the AWS Service Catalog console. This tutorial helps translate this example to your own specific provisioned products.

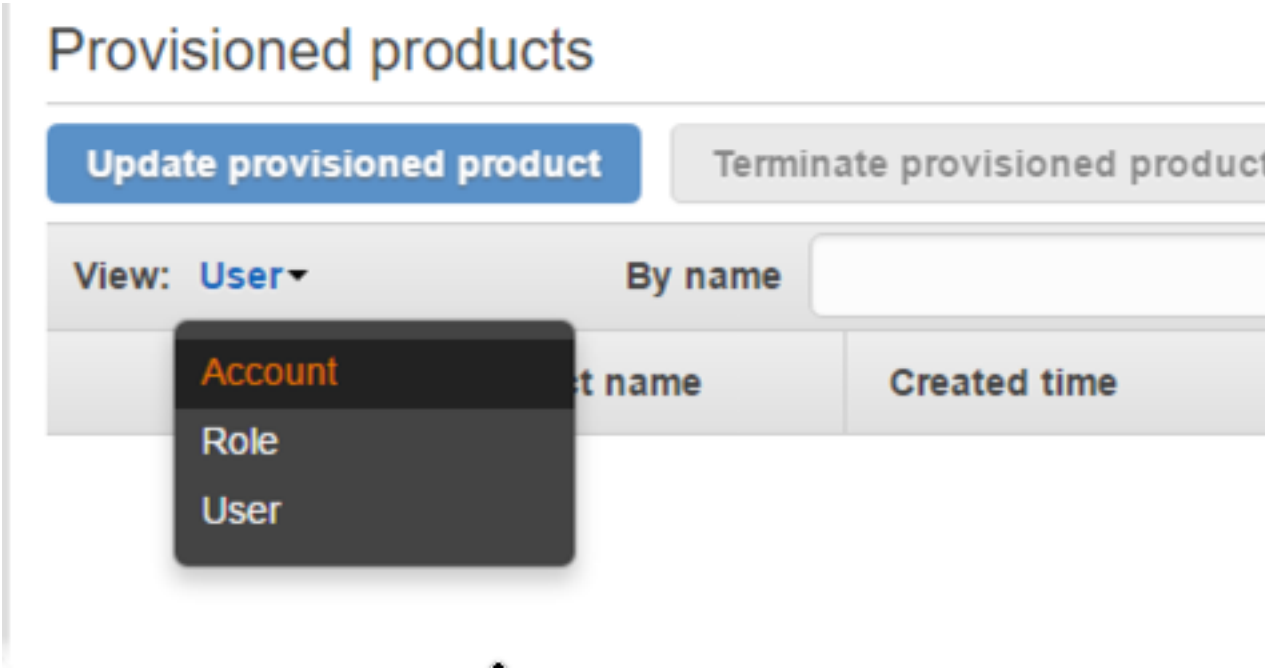
To manage all provisioned products for the account, you need **ServiceCatalogAdminFullAccess** or equivalent access to the provisioned product write operations. For more information, see Controlling Access Using Service-level Permissions (p. 25).

To identify the user who provisioned a product and the associated resources

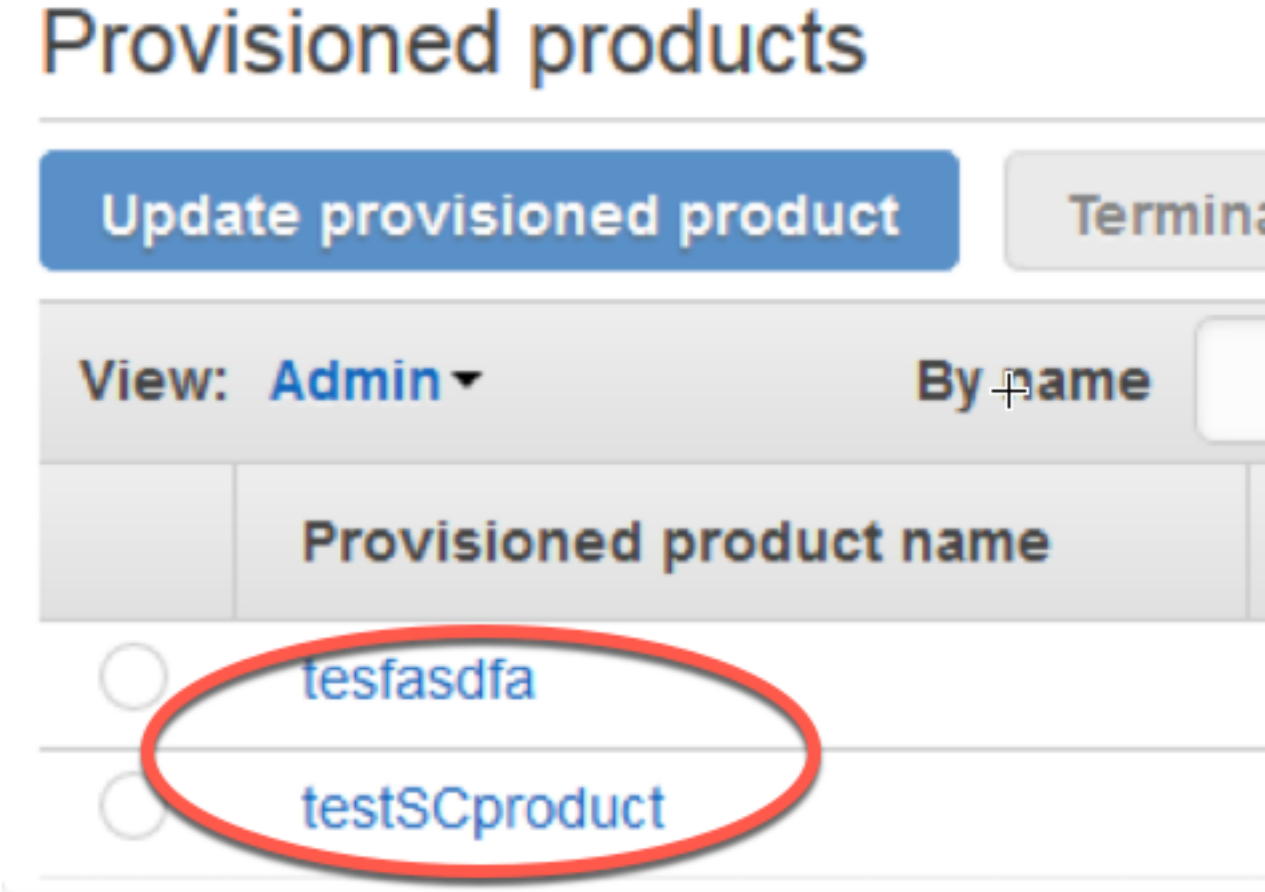
1. Navigate to the provisioned products console in AWS Service Catalog console.



2. In the **Provisioned products** pane, for **View**:, choose **Account**.



3. Identify the provisioned product to investigate, and select the provisioned product.

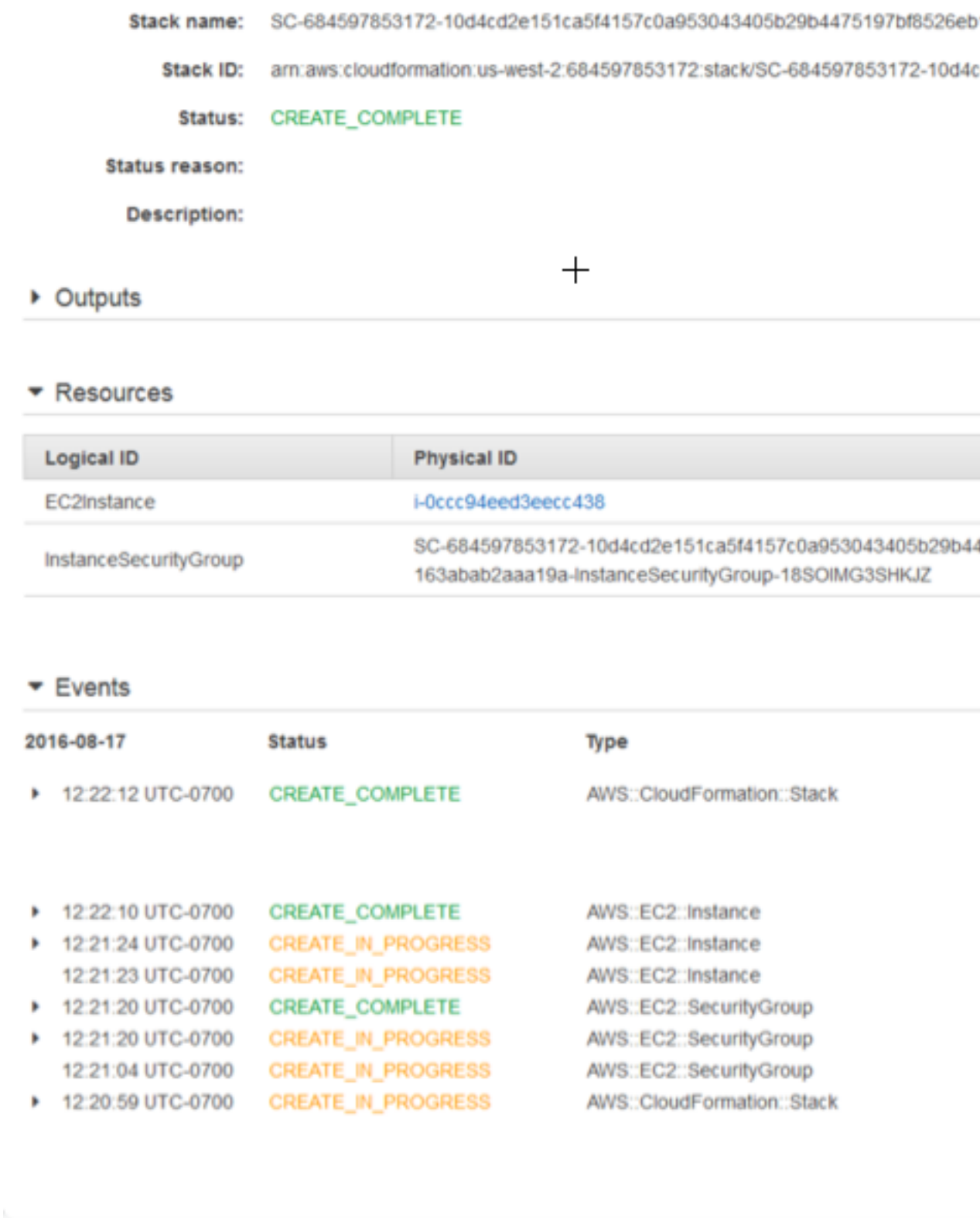


4. Expand the **Events** section and note the **Provisioned product ID** and **CloudformationStackARN** values.
5. Use the provisioned product ID to identify the CloudTrail record that corresponds to this launch and identify the requesting user (typically, this is entered as an email address during federation). In this example, it is "steve".

```
{
  "eventVersion":"1.03","userIdentity":
  {
    "type":"AssumedRole",
    "principalId":"[id]:steve",
    "arn":"arn:aws:sts::[account number]:assumed-role/SC-usertest/steve",
    "accountId":[account number],
    "accessKeyId":[access key],
    "sessionContext":
    {
      "attributes":
      {
        "mfaAuthenticated":[boolean],
        "creationDate":[timestamp]
      },
      "sessionIssuer":
      {
        "type":"Role",
        "principalId":"AROAJEXAMPLELH3QXY",
        "arn":"arn:aws:iam::[account number]:role/[name]",
        "accountId":[account number],
        "userName":[username]
      }
    }
  },
  "eventTime":"2016-08-17T19:20:58Z","eventSource":"servicecatalog.amazonaws.com",
  "eventName":"ProvisionProduct",
  "awsRegion":"us-west-2",
  "sourceIPAddress":[ip address],
  "userAgent":"Coral/Netty",
  "requestParameters":
  {
    "provisioningArtifactId":[id],
    "productId":[id],
    "provisioningParameters":[Shows all the parameters that the end user entered],
    "provisionToken":[token],
    "pathId":[id],
    "provisionedProductName":[name],
    "tags":[],
    "notificationArns":[]
  },
  "responseElements":
  {
    "recordDetail":
    {
      "provisioningArtifactId":[id],
      "status":"IN_PROGRESS",
      "recordId":[id],
      "createdTime":"Aug 17, 2016 7:20:58 PM",
      "recordTags":[],
      "recordType":"PROVISION_PRODUCT",
      "provisionedProductType":"CFN_STACK",
      "pathId":[id],
      "productId":[id],
      "provisionedProductName":"testSCproduct",
      "recordErrors":[],
      "provisionedProductId":[id]
    }
```

```
  },
  "requestID":[id],
  "eventID":[id],
  "eventType":"AwsApiCall",
  "recipientAccountId":[account number]
}
```

6. Use the CloudformationStackARN value to identify AWS CloudFormation events to find information about resources created. You can also use the AWS CloudFormation API to obtain this information. For more information, see AWS CloudFormation API Reference.


Stack name: SC-684597853172-10d4cd2e151ca5f4157c0a953043405b29b4475197bf8526eb
Stack ID: arn:aws:cloudformation:us-west-2:684597853172:stack/SC-684597853172-10d4c
Status: CREATE_COMPLETE
Status reason:
Description:
Outputs
Resources
Logical ID
Physical ID
EC2Instance
i-0ccc94eed3eecc438
InstanceSecurityGroup
SC-684597853172-10d4cd2e151ca5f4157c0a953043405b29b44
163abab2aaa19a-InstanceSecurityGroup-18SOIMG3SHKJZ
Events
2016-08-17
Status
Type
12:22:12 UTC-0700
CREATE_COMPLETE
AWS::CloudFormation::Stack
12:22:10 UTC-0700
CREATE_COMPLETE
AWS::EC2::Instance
12:21:24 UTC-0700
CREATE_IN_PROGRESS
AWS::EC2::Instance
12:21:23 UTC-0700
CREATE_IN_PROGRESS
AWS::EC2::Instance
12:21:20 UTC-0700
CREATE_COMPLETE
AWS::EC2::SecurityGroup
12:21:20 UTC-0700
CREATE_IN_PROGRESS
AWS::EC2::SecurityGroup
12:21:04 UTC-0700
CREATE_IN_PROGRESS
AWS::EC2::SecurityGroup
12:20:59 UTC-0700
CREATE_IN_PROGRESS
AWS::CloudFormation::Stack

Note that you can perform steps 1 through 4 using the AWS Service Catalog API or the AWS CLI. For more information, see AWS Service Catalog Developer Guide and AWS Service Catalog Command Line Reference.

Document History

The following table describes the important changes to the documentation since the last release of AWS Service Catalog.

- **Latest documentation update**: September 15, 2016

Feature	Description	Release Date
Support for integrated console	Content updates including console access information.	November 16, 2016
Support for access level filter	Content updates including access level filtering information.	September 15, 2016
Admin Guide refresh	This update provides a refresh to a number of sections, and adds several new sections to make the organization more optimal.	July 5, 2016
Steps for importing a portfolio	The Importing a Portfolio (p. 57) section provides steps for importing a portfolio that was shared from another AWS account.	February 16, 2016
Updates to permissions information	The Console Access for End Users (p. 26) section provides considerations for granting access to the end user console view.	February 16, 2016
Updates to getting started tutorial	The information in Getting Started (p. 13) is updated.	January 20, 2016
Documentation updates for overriding imported launch constraints	The information in Portfolio Sharing (p. 54) is updated to explain how launch constraints are inherited by imported portfolios and how the administrator who imports a portfolio can override these launch constraints.	July 31, 2015

Feature	Description	Release Date
Documentation updates for IAM policies and sample launch role	Replaced the sample IAM policies in Controlling Access Using Service-level Permissions (p. 25) with references to the AWS managed policies in IAM, which are preconfigured for AWS Service Catalog. Corrected the sample launch role and added a sample trust policy in Applying a Launch Constraint (p. 30).	July 22, 2015
New guide	This is the first release of *AWS Service Catalog Administrator Guide*.	July 9, 2015