HP Cloud Service Automation

For the Windows ® and Linux operating systems

Software Version: 4.00

Cloud Service Management Console Help

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Note: Some topics do not convert properly to PDF, causing format problems. Some elements of online help are completely removed from the PDF version. Those problem topics can be successfully printed from within the online help.

Contents

Welcome to Cloud Service Management Console Help

HP Cloud Service Automation (HP CSA) orchestrates the deployment of infrastructure compute resources and complex multi-tier application architectures. HP CSA integrates and leverages the strengths of several HP data center management and automation products, adding resource modeling, service offering design, service design, and a customer portal to create a comprehensive service automation solution.

The Cloud Service Management Console help is designed to answer questions you may have while using the Cloud Service Management Console. For information about HP CSA concepts, see the *HP Cloud Service Automation Concepts Guide*. For information about installation and initial configuration of HP CSA, see the *HP Cloud Service Automation Installation Guide* and the *HP Cloud Service Automation Configuration Guide*.

Based on your role, specific areas of the Cloud Service Management Console are available to you.

HP Cloud Service Automation Roles

The Cloud Service Management Console and this online help system are designed to support the following roles:

- **Consumer Service Administrator** - The Consumer Service Administrator configures and manages consumer and provider organizations.
- **CSA Administrator** - The Administrator has access to all functionality in the Cloud Service Management Console.
- **Resource Supply Manager** - The Resource Supply Manager creates and manages cloud resources, such as providers and resource offerings.
- **Service Business Manager** - The Service Business Manager creates and manages the service offerings and service catalogs.
- **Service Designer** - The Service Designer designs, implements, and maintains service designs (also referred to as blueprints), component palettes, component types, and component templates.
- **Service Operations Manager** - The Service Operations Manager views and manages subscriptions and service instances.

For more information about user roles, see the topic "Role Descriptions" in the Organizations Help.

HP Cloud Service Automation Functions

Use the initial dashboard view to navigate to the area of the Cloud Service Management Console where you can complete your tasks. You can always click **Cloud Service Automation** in the title bar to return to the dashboard. Depending on your role, the following areas and functionality are available to you:

Organizations	
Summary	Manage organizations.
Details	• **General Information** - Customize an organization. • **Portal Customization** - Customize the Marketplace Portal. • **Dashboard Widgets** - Customize widgets for the Marketplace Portal. • **LDAP** - Configure LDAP for an organization. • **Access Control** - Configure membership to predefined roles. • **Email Notifications** - Configure the mail server used to send email notifications and some email source settings. • **Operations** - Configure operational settings for your organization. • **Catalogs** - View the catalogs associated with an organization.
Role Access	Consumer Service Administrator, CSA Administrator

Resources	
Summary	Manage providers and resource offerings.

Resources	
Details	• **Providers** - View, create, or edit a provider, associate or dissociate providers with an environment, view or edit properties of a provider, associate or dissociate offerings with a provider, associate or dissociate environments with a provider, manage custom provider properties, manage provider types, view, manage environments, and manage resource pools. • **Resource Offerings** - View, create, import, export, or delete an offering, view or edit properties of an offering, associate or dissociate providers with an offering, manage lifecycle actions, manage custom offering properties, manage a category, and view service designs associated with an offering.
Role Access	Resource Supply Manager, CSA Administrator

Components	
Summary	Manage component palettes, component types, and component templates.
Details	• **Component Palettes** -View, create, edit, import, export, or delete component palettes, which contain groups of component types. • **Component Types** - View, create, edit, or delete component types, which are used as a basic building block in service designs. • **Component Templates** - View, create, edit, or delete component templates, which are used to simplify service design creation.
Role Access	Service Designer, CSA Administrator

Designs	
Summary	Manage service designs.
Details	• **Service Designs** - View, create, copy, import, export, or delete a service design. Configure resource bindings, lifecycle actions for service components, and subscriber options. View service offerings created from the service design.
Role Access	Service Designer, CSA Administrator

Offerings	
Summary	Browse, create, edit, import, export, or delete a service offering.
Details	• **General Information** - Customize a service offering, and export a service offering. • **Options** - Edit service offering options. • **Pricing** - Configure pricing for a service offering. • **Associated Documents** - Attach a document to a service offering.
Role Access	Service Business Manager, CSA Administrator

Catalogs	
Summary	View, create, edit, import, export, or delete service catalogs and publish service offerings to the Marketplace Portal.
Details	• **General Information** - Customize a catalog and select the approval process and policy. • **Access Control** - Configure who can access a catalog. • **Approval Policies** - Add or edit an approval policy. • **Categories** - Create, edit, or delete categories. • **Published Offerings** - View service offerings by category, publish or unpublish service offerings to a category, or edit the approval process or policy for a service offering. • **Resource Environments** - View or select an environment for a catalog.
Role Access	Service Business Manager, CSA Administrator

Operations	
Summary	View or manage subscriptions and service instances.

Operations	
Details	• **Organizations** - View a summary of subscriptions and requests for each subscriber, view details about a specific subscription, including properties and values, service topology, event log, and resource providers. Transfer one or more subscriptions from one subscriber to another within the same organization, and resume or cancel subscriptions.
Role Access	Service Operations Manager, CSA Administrator

Custom	
Summary	Optional area for accessing customized content.
Details	If enabled, displays content that is customized for this instance of the Cloud Service Management Console (for information on how to enable this area, see the *HP Cloud Service Automation Configuration Guide.*
Role Access	All roles (Consumer Service Administrator, CSA Administrator, Resource Supply Manager, Service Business Manager, Service Designer, Service Operations Manager)

Managing the Software License

You can use the Cloud Service Management Console to view, add, or remove software licenses if you are logged in as a CSA Administrator (other users can view licensing information, but cannot add or remove software licenses). HP CSA licensing is based on the number of operating system instances (OSIs) being used in current, active subscriptions. You can add more licenses at any time to increase your OSI capacity.

When users log into the Cloud Service Management Console, a licensing status banner will appear in the following situations:

Note: Expiration information is displayed only for the trial license.

- The trial license is the only valid license. The banner displays the number of days remaining on the trial license.
- When you upgrade your product, a banner displays the number of days remaining on the trial license.

- The trial license has expired, there is no valid license, and you have exceeded the allowed number of operating system instances. The banner informs you that you have exceeded the allowed number of licenses.
- The trial license has expired, and there is no valid license. The banner displays the number of operating system instances allowed for an unlicensed version of the software. Any existing subscriptions will continue to work normally, except that flex up operations on existing subscriptions will not be supported.
- One or more valid licenses are installed, and you have exceeded the allowed number of operating system instances. The banner displays the number of active operating system instances by which you are exceeding the allowable license count.

The banner information updates when you refresh your view, log into the Cloud Service Management Console, or navigate to a new section of the Cloud Service Management Console by clicking a tile in the Dashboard.

To view your software license:

1. In the Cloud Service Management Console masthead, from the **Options** ( ) menu select **Licensing**.
2. You can view the following information about your license:
   - Cumulative count of purchased operating system instances.
   - Current number of operating system instances being used in HP CSA active subscriptions.
   - Current license key(s).

To add a license:

When you add a new license (one that is not a trial license), existing subscriptions will not be affected. If you exceed your OSI limit, a banner displays the number of active operating system instances by which you are exceeding the allowable license count.

1. In the Cloud Service Management Console masthead, from the **Options** ( ) menu select **Licensing**.
2. Click **Add**.
3. Enter your license key in the box.

4. Click **Add**.
5. Click **Done**. The new license displays in the UI.

To delete a license:

When you delete a license (one that is not a trial license), a banner displays the number of operating system instances allowed. Any existing subscriptions will continue to work normally, except that flex up operations on existing subscriptions will not be supported.

You cannot delete the trial license.

1. In the Cloud Service Management Console masthead, from the **Options** ( ) menu select **Licensing**.
2. Select the license key you want to remove.
3. Click **Delete**.
4. Click **Yes** to confirm deletion.
5. The license is removed from the system.

Organizations

Use the **Organizations** area of the Cloud Service Management Console to manage organizations. From this section, in the upper left corner, you can view the total number of organizations created, including the provider organization.

Using the Organizations Interface

Item	Description
	Reload the data in this view.
Create Organization button	Create an organization.
	Delete a group DN from a role.
	Display a tooltip for the associated field by placing the cursor on this icon.

Informational Icons

Icon	Description
	When this icon is adjacent to an organization, it denotes the provider organization. There can be only one provider organization and it is automatically configured. You may modify the provider organization, as needed. However, you cannot delete it. When this icon is adjacent to a catalog, it denotes the global catalog. There can be only one global catalog and it is visible to all organizations. You may modify the global catalog, as needed. However, you cannot delete it.
*	Indicates the field is required, and you must enter information in order to successfully complete the organization's configuration.

What are Organizations?

An organization determines a member's entry point into the cloud system and associates its members with services and resources. An organization may be a company, business unit, department, or group.

Membership in an organization is determined by the organization's LDAP (Lightweight Directory Access Protocol) directory. When a user logs in to the Cloud Service Management Console or Marketplace Portal, LDAP authenticates the login credentials by verifying that the user name and password match an existing user in the LDAP directory. The LDAP server used by users to log in to the Cloud Service Management Console or Marketplace Portal should already be configured. See the *HP Cloud Service Automation Configuration Guide* for more information.

Authorization or abilities of a member of an organization (such as creating a service design or managing cloud resources) are determined by predefined roles in HP Cloud Service Automation and membership to group DNs in the LDAP directory. In HP Cloud Service Automation, you assign a group DN to a predefined role which has predefined abilities. See "Access Control" on page 47 for more information.

There are two types of organizations in HP Cloud Service Automation:

- **Provider Organization** - The provider organization hosts HP Cloud Service Automation, manages consumer organizations, and manages resources and services, including those offered by third-party or public clouds.

  Using the Cloud Service Management Console, members of the provider organization can create one or more consumer organizations, manage configured organizations, and manage resources and services (such as designing, offering, and publishing resources and services for consumption).

  The organizations, resources, and services that can be managed are determined by the role(s) assigned to the members of the provider organization. For example, the CSA Administrator manages all organizations, resources, and services, while the Consumer Service Administrator only manages all organizations. Additional roles include the Resource Supply Manager who manages resource providers and resource offerings, the Service Designer who manages service components and service designs, the Service Business Manager who manages service offerings and service catalogs, and the Service Operations Manager who manages subscriptions and service instances.

  There is only one provider organization for each instance of HP Cloud Service Automation and it is automatically set up during installation. You may modify the provider organization, as needed. However, you cannot delete it.

- **Consumer Organization** - The consumer organization, using the Marketplace Portal, subscribes to or consumes the resources and services provided by the provider organization. There may be multiple consumer organizations configured by the provider organization. However, each consumer or subscriber sees only the information of the consumer organization of which he is a member (membership to a consumer organization is determined by the LDAP

configuration of the consumer organization).

At installation, a single consumer organization is set up. You may modify this default consumer organization, as needed.

See "LDAP" on page 42 and the *HP Cloud Service Automation Configuration Guide* for more information about configuring LDAP for the provider and consumer organizations.

Create an Organization

For more information about organizations, see "What are Organizations?" on page 30

To create an organization

Only consumer organizations may be created.

1. In the left navigation frame, click the **Create Organization** button.
2. Provide the following information:

Item	Description
Organization Name	A unique name that identifies the organization.

3. Click **Create**.
4. Configure the organization. See the following topics that describe how to provide information in the following areas:
   - "General Information" on page 34
   - "Portal Customization" on page 36
   - "Dashboard Widgets" on page 39
   - "LDAP" on page 42
   - "Access Control" on page 47
   - "Email Notifications" on page 53

- "Operations" on page 54
- "Catalogs" on page 57

5. Additional steps may be required to configure the Marketplace Portal for this organization. Refer to the *HP Cloud Service Automation Configuration Guide* for more information.

View an Organization

For more information about organizations, see "What are Organizations?" on page 30

To view an organization

1. In the left navigation frame, select the organization.
2. In the organization's navigation frame, select **Summary** to view a summary of the organization. Select any of the other sections to view more detailed information.

Configure an Organization

For more information about organizations, see "What are Organizations?" on page 30

To configure an organization

1. In the left navigation frame, select the organization.
2. In the organization's navigation frame, select a section in which you can configure information about the organization.

Summary

View a summary of the selected organization's configuration. To configure or update this information, in the organization's navigation frame, select the appropriate section such as Portal Customization, LDAP, Access Control, or Email Notifications.

Viewable Summary Information

Section	Displayed Summary Information
Portal Customization	• Portal Title - The name of the organization that appears in the Marketplace Portal. This section is not available to the provider organization.
LDAP	• Hostname - The hostname used to connect to the LDAP server. • Port - The port used to connect to the LDAP server.
Access Control	• List of roles - Roles in the organization to which group DNs can be assigned.
Email Notifications	• Sender Email Address - Email address that appears as the sender of email notifications. • Port - The port used to connect to the mail server when sending email notifications.

General Information

General information appears at the top of the organization's page in the Cloud Service Management Console. To affect the appearance of the Marketplace Portal, click the **Portal Customization** section (see "Portal Customization" on page 36).

For more information about organizations, see "What are Organizations?" on page 30

To configure general information about an organization

1. In the organization's navigation frame, select **General Information**.
2. Provide or update the following information:

Item	Description
Organization Identifier	A unique name that HP Cloud Service Automation assigns to the organization. For a consumer organization, this name is based on the name entered when the organization was created. The organization identifier is needed when launching the Marketplace Portal. The organization identifier may also be needed when customizing the Marketplace Portal. See the *HP Cloud Service Automation Configuration Guide* for more information.
Organization URL	A URL for connecting to the Marketplace Portal for the organization.
Organization Display Name	A unique name that identifies the organization.
Description	A description of the organization.
Organization Logo	An image that represents the logo of the organization. The logo may appear in the following locations: ■ The **Cloud Service Management Console** - Top left of an organization's page. ■ The **Marketplace Portal** - Top left of the login screen and top left of each portal page. Click **Upload Image** to add your own image. Supported file extensions include `.jpg`, `.jpeg`, `.gif`, and `.png`. The recommended image size is 256 by 256 pixels, and the image will be scaled to the appropriate size. The images are stored in the `%CSA_HOME%\jboss-as-7.1.1.Final\standalone\deployments\csa.war\images\library` folder of the HP CSA server.

3. Click **Save**.

To delete an organization

Only consumer organizations may be deleted. In order to successfully delete a consumer organization, it must not have any active consumer catalogs.

1. In the left navigation frame, select the organization to delete.
2. In the organization's navigation frame, select **General Information**.
3. Click **Delete**.
4. In the **Delete Organization?** dialog, click **Yes** to delete the organization.

Portal Customization

For more information about organizations, see "What are Organizations?" on page 30

Portal customization allows you to customize an organization's Marketplace Portal.

Note: This section is not available to the provider organization.

To customize the Marketplace Portal

1. In the organization's navigation frame, select **Portal Customization**.
2. Provide or update the following information for portal customization:

   Application Labeling

Item	Description
Application Name	Type a name that displays on the login screen and header of your organization's Marketplace Portal.
Portal Welcome Message	Type a welcome message that displays below the Application Name when a user logs into your organization's Marketplace Portal.
Copyright Statement	Type a copyright statement that displays on the login page below the Log In button of your organization's Marketplace Portal.

External Organization Links

Item	Description
Privacy Statement Link	Type the link to your organization's privacy statement that appears on the login page below the copyright statement.
Show Privacy Statement on Marketplace Portal	Check the box to display the privacy statement link on the login page of your organization's Marketplace Portal.
Terms and Conditions Link	Type the link to your organization's terms and conditions statement that appears when a subscriber is ordering a service.
Show Terms and Conditions on Marketplace Portal	Check the box to display the terms and conditions link when a subscriber is ordering a service.

Application Enhancements

Item	Description
Featured Category	Type a featured category to use when displaying service offerings in the Marketplace Portal. Service offerings in this category will display in the Featured Services tile of the Marketplace Portal.
Subscription End Date Period (months)	Check the **Enforce End Date** box to prevent recurring subscriptions and to require all subscriptions to be term subscriptions. Select the number of months, after which, subscriptions will end. This is the maximum length of a subscription, in months, if a requested end date is specified. When a subscriber selects a requested start date and requests an end date, the length of the subscription cannot be longer than the value of this property. The maximum allowed value is 12 months. For example, if the subscriber selects a requested start date of June 15, 2014, based on the default value of this property, the requested end date cannot be later than June 14, 2015. If no end date is selected, this value is ignored.
History Details	Select the **Show Verbose Errors** box to display the status of the actions executed during the lifecycle of a service.

Themes

Item	Description
Theme	Select a theme or type the name of a customized theme for your organization's Marketplace Portal. Themes define colors, fonts and the general look-and-feel of the Marketplace Portal. The following themes are shipped out-of-the-box: ■ HP Simplified ■ HP Enterprise ■ HP Playful

Security Settings

Item	Description
Security Classification	Select from the following security banner options: ■ **No Banner** - no banner displays in the Marketplace Portal. ■ **Unclassified** - The banner is light green and contains no content. ■ **Unclassified FOUO** - For official use only. The banner is light green and displays the text "FOUO." ■ **Unclassified NOFORN** - Not releasable to foreign nationals. The banner is light green and displays the text "NOFORN." ■ **Confidential** - The banner is light blue and displays the text "CONFIDENTIAL." ■ **Confidential FOUO** - The banner is light blue and displays the text "CONFIDENTIAL-FOUO." ■ **Confidential NOFORN** - The banner is light blue and displays the text "CONFIDENTIAL-NOFORN." ■ **Secret** - The banner is red and displays the text "SECRET. ■ **Top Secret** - The banner is orange and displays the text "TOP SECRET."
Disclaimer	Type text for the disclaimer for your organization's Marketplace Portal. The disclaimer appears on the login page of the Marketplace Portal.

3. Click **Save**.

Dashboard Widgets

For more information about organizations, see "What are Organizations?" on page 30

Create and edit custom tiles for your organization's Marketplace Portal dashboard.

Note: This section is not available to the provider organization.

To create or update dashboard widgets

1. In the organization's navigation frame, select **Dashboard Widgets**.
2. To create a widget, click a button listed in the following table. Or click **edit** for the item you want to update.
3. Provide or update the following information:

Button	Description
Add Link	Provide or change the following: • Name - The name associated with this link in the Cloud Service Management Console. • Title - The text that displays for the link in the Marketplace Portal. • Icon URL - The URL of an icon that displays near the center of the widget in the Marketplace Portal. • Background Image URL - The URL of an image that fills the background of the widget in the Marketplace Portal. • URL - The URL that the link references in the Marketplace Portal. • Target - The target attribute of the `<link>` element that appears in the Marketplace Portal and that controls the browser window in which the link will open. Valid values for the target attribute are defined in the HTML specification.

Button	Description
Add Mashup	Provide or change the following: • Name - The name associated with this widget in the Cloud Service Management Console. • Content - The HTML and JavaScript code for the mashup. **When using iFRAME in a mashup widget, note the following:** • iFrames that serve HTML pages that have the same URL structure as the Marketplace Portal will work properly. The same URL structure means that the pages are placed in the following directory: %CSA_HOME%`\portal\node_modules\mpp-ui\dist` **For example, to correlate to the following URL structure:** `https://server:8089/widgets/sample/index.html` **You would place your pages in the following location:** %CSA_HOME%`\portal\node_modules\mpp-ui\dist\widgets\sample\index.html` • iFrames that serve external NON-HTTPS content will be blocked by the browser. The specific error will vary based on client browser security. • iFrames that serve external HTTPS content that contains mixed HTTP and NON-HTTPS content will be blocked by the browser. The specific error will vary based on client browser security. • iFrames that serve external HTTPS content will work only if the following are true: ▪ The remote site must not specify `x-frame-options DENY` in the response header. ▪ If the content is not of the same origin domain, and the remote site has not `specified x-frame-options SAMEORIGIN`, the content will display properly.

Button	Description
Add Featured Service	Adds a tile to the Marketplace Portal dashboard that contains a random service offering in the featured category configured for your organization. Provide or change the following: • Name - The name associated with this widget in the Cloud Service Management Console.

LDAP

LDAP (Lightweight Directory Access Protocol) used by HP Cloud Service Automation is configured in the Cloud Service Management Console.

LDAP is used to:

- Authenticate a user's login to the Cloud Service Management Console or Marketplace Portal
- Authenticate a user's access to information
- Authorize a user's access to information

To completely configure access to HP Cloud Service Automation, you must configure LDAP to authenticate a user's login, configure LDAP for an organization to authenticate a user's access to information, and configure access control for an organization to authorize a user's access to information.

From this page you can:

- Configure LDAP for authentication to log in to HP Cloud Service Automation
- Configure LDAP to access information in HP Cloud Service Automation.

When you configure LDAP for the provider organization, you are configuring the set of users who can log in and be authenticated to perform actions in the Cloud Service Management Console. And, when you configure LDAP for the consumer organization, you are configuring the set of users who can log in and be authenticated to perform actions in the Marketplace Portal.

To configure authorization to access information in HP Cloud Service Automation for organizations, see "Access Control" on page 47.

For more information about organizations, see "What are Organizations?" on page 30

To configure LDAP

Note: If you are configuring HP CSA to be compliant with FIPS 140-2, configure HP CSA for FIPS 140-2 compliance before configuring this item. Refer to the *Configure HP CSA for FIPS 140-2 Compliance* section of the *HP Cloud Service Automation Configuration Guide* for more information.

1. In the organization's navigation frame, select **LDAP**.
2. Provide or update the following information:

LDAP Server Information

Configure the LDAP server and a user with access to the server.

Item	Description
Hostname	The fully-qualified LDAP server domain name (server.domain.com) or IP address. Example: `ldap.xyz.com`
Port	The port used to connect to the LDAP server (by default, 389). Example: `389`
Connection Security	If the LDAP server is configured to require ldaps (LDAP over SSL), select the **SSL** checkbox.
Base DN	Base distinguished name. The Base DN is the top level of the LDAP directory that is used as the basis of a search. Example: `o=xyz.com`

Item	Description
User ID (Full DN)	The fully distinguished name of any user with authentication rights to the LDAP server. If the LDAP server does not requre a User ID or password for authentication, this value can be omitted. Example: `uid=admin@xyz.com,ou=People,o=xyz.com`
Password	Password of the User ID. If the LDAP server does not requre a User ID or password for authentication, this value can be omitted.

LDAP Attributes

Enter the names of the attributes whose values are used for email notifications, authentication, and approvals in HP Cloud Service Automation.

Item	Description
User Email	The name of the attribute of a user object that designates the email address of the user. The email address is used for notifications. If a value for this attribute does not exist for a user, the user does not receive email notifications. Default: `mail`
Group Membership	The name of the attribute(s) of a group object that identifies a user as belonging to the group. If multiple attributes convey group membership, the attribute names should be separated by a comma. Default: `member,uniqueMember`
Manager Identifier	The name of the attribute of a user object that identifies the manager of the user. Default: `manager`

Item	Description
Manager Identifier Value	The name of the attribute of a user object that describes the value of the Manager Identifier's attribute. For example, if the value of the Manager Identifier attribute is a distinguished name (such as `cn=John Smith, ou=People, o=xyz.com`) then the value of this field could be `dn` (distinguished name). Or, if the Manager Identifier is an email address (such as `admin@xyz.com`) then the value of this field could be `email`. Default: `dn`
User Avatar	LDAP attribute whose value is the URL to a user avatar image that will display for the logged in user in the Marketplace Portal. If no avatar is specified, a default avatar will be used.

User Login Information

HP Cloud Service Automation uses a user search-based login method to authenticate access to information.

Item	Description
User Name Attribute	The name of the attribute of a user object that contains the username that will be used to log into the Cloud Service Management Console or Marketplace Portal. The value for this field can be determined by looking at one or more user objects in the LDAP directory to determine which attribute consistently contains a unique user name. Often, you will want a **User Name Attribute** whose value in a user object is an email address. Examples: `userPrincipalName` or `sAMAccountName` or `uid`
User Search Base	The location in the LDAP directory where users' records are located. This location should be specified relative to the Base DN. If users are not located in a common directory under the Base DN, leave this field blank. Examples: `cn=Users` or `ou=People`

Item	Description
User Search Filter	Specifies the general form of the LDAP query used to identify users during login. It must include the pattern `{0}`, which represents the user name entered by the user when logging in to the Cloud Service Management Console or Marketplace Portal. The filter is generally of the form `<attribute>= 0}`, with `<attribute>` typically corresponding to the value entered for **User Name Attribute**. Examples: `userPrincipalName={0}` or `sAMAccountName={0}` or `uid={0}`
Search Option (Search Subtree)	When a user logs in to the Cloud Service Management Console or Marketplace Portal, the LDAP directory is queried to find the user's account. The **Search Subtree** setting controls the depth of the search under **User Search Base**. If you want to search for a matching user in the **User Search Base** and all subtrees under the **User Search Base**, leave the **Search Subtree** checkbox selected. If you want to restrict the search for a matching user to only the **User Search Base**, excluding any subtrees, unselect the **Search Subtree** checkbox.

3. Click **Save**.

Example LDIF Content Record

The following is a sample LDIF content record that shows the `uniqueMember` group membership attribute being used to define users `cn=User1,ou=providers,ou=users,ou=system` and `cn=Manager1,ou=managers,ou=users,ou=system` as members of the group `cn=ResourceSupplyManagers,ou=providergrp,ou=groups,ou=system`.

```
dn: cn=ResourceSupplyManagers,ou=providergrp,ou=groups,ou=system
objectclass: groupOfUniqueNames
objectclass: top
cn: ResourceSupplyManagers
uniqueMember: cn=User1,ou=providers,ou=users,ou=system
uniqueMember: cn=Manager1,ou=managers,ou=users,ou=system
```

To assign this group or DN to the Resource Supply Manager Role, go to the Access Control section of the Organizations area and add the `cn=ResourceSupplyManagers,ou=providergrp,ou=groups,ou=system` DN to the Resource Supply Manager role.

Look Up User

The **Look Up User** button allows for the displaying of common LDAP attribute values for a specified user. Also, this button validates the User Login Information (User Name Attribute, User Search Base, and User Search Filter).

Provide the user name attribute value of a user to display that user's DN, common name, display name, email address, and manager.

The lookup also validates the User Name Attribute, User Search Base, and User Search Filter (if attribute information is displayed, these fields are correctly defined).

To look up a user

1. In the organization's navigation frame, select **LDAP**.
2. Provide all the required LDAP service access information.
3. Click **Save**.
4. Click **Look Up User**.
5. Provide the user name attribute value of a user to look up.
6. Click **Search**.

Access Control

Roles control what a user can access in HP CSA. The Service Consumer role is defined in the consumer organizations in the **Access Control** section. All other roles are defined in the Provider organization in the **Access Control** section.

Access control allows you to add or remove directory service groups or organization units (ou) to a CSA role by associating the ou's distinguished name (DN) to the desired role. Authenticated LDAP users, who are members of a group or organization unit that is assigned to a predefined role, can perform specific tasks and access specific parts of the Cloud Service Management Console or access the Marketplace Portal. See "Role Descriptions" on page 49 for more information.

Only members of a group or organization unit are assigned to the role. To ensure secure role assignment, access control inheritance stops at the assigned organizational unit. This does not

follow the traditional directory service pattern where inheritance flows down the organizational unit's hierarchy. Instead, assignments to roles must be assigned to individual organizational units (ou).

A group or organization unit DN can be assigned to more than one role.

LDAP must be configured in order to authenticate users so that they can log in to the Cloud Service Management Console and Marketplace Portal. Refer to "LDAP" on page 42 for more information.

For more information about organizations, see "What are Organizations?" on page 30

To add a DN to a role

1. Locate the role to which you want to add a DN.
2. Below the role, click **Add DN**.
3. Provide the following information, and click **Save**:

To select an existing named DN:

Item	Description
Select from existing named DNs	Select an existing named DN (that identifies a group or organization unit DN) to add to the role. If there are no existing named DNs, this item is not selectable.

To add a new named DN:

Item	Description
Enter a name for the group or organization unit DN	Enter a name to identify the DN.
Enter a group or organization unit DN	Enter the group or organization unit DN to add to the role. This DN must be relative to the Base DN you configured in the LDAP section of this organization. If the base DN is empty, supply the full DN of the group.

To update a name or DN in a role

1. Locate the role whose DN you want to update.
2. Below the role, locate the DN you want to update.

3. Move your cursor over the DN and click the **Edit** button.
4. In the **Update DN** dialog, update the DN name and/or the DN.
5. Click **Update**.

To remove a named DN from a role

> **Note:** The named DN (group) is not deleted; instead, it is disassociated from the role. You will still see the group when you click **Add DN** and then click **Select from existing named DNs**.

1. Locate the role from which you want to remove a named DN.
2. Below the role, locate the group you want to remove.
3. Click the **Remove DN** icon ( ).
4. Click **Yes**.

Role Descriptions

HP Cloud Service Automation provides the following predefined roles to which you can assign group or organization unit DNs:

Provider Organization Roles

- Consumer Service Administrator (see "Consumer Service Administrator" on the facing page)
- CSA Administrator (see "CSA Administrator" on the facing page)
- Resource Supply Manager (see "Resource Supply Manager" on the facing page)
- Service Business Manager (see "Service Business Manager" on page 51)
- Service Designer (see "Service Designer" on page 51)
- Service Operations Manager (see "Service Operations Manager" on page 51)

Consumer Organization Roles

- Service Consumer (see "Service Consumer" on page 52)

Adding a DN to these roles authorizes members of the LDAP directory organizational units access to the Cloud Service Management Console or Marketplace Portal. If a user has access to the Cloud Service Management Console, a user may have access to one or more of the functional areas in the console. If a user has access to the Marketplace Portal, a user has access to all areas in the portal.

Provider Organization Roles

Provider organization roles authorize members to perform specific tasks, access specific parts of the Cloud Service Management Console, and are typically configured by the CSA Administrator.

Consumer Service Administrator

The Consumer Service Administrator configures and manages consumer and provider organizations. From the Cloud Service Management Console, the Consumer Service Administrator can customize some aspects of the appearance of the Marketplace Portal, configure authentication to access information in HP Cloud Service Automation, assign members to roles granting authorization to use the Cloud Service Management Console and Marketplace Portal, configure the SMTP server used to send email notifications, and view catalogs associated with an organization.

The Consumer Server Administrator has access to the **Organizations** area of the Cloud Service Management Console.

CSA Administrator

The Administrator has access to all functionality in the Cloud Service Management Console. The CSA Administrator initially configures authentication and assigns members to roles granting authorization to use the Cloud Service Management Console, enabling other users to log in and configure the Cloud Service Management Console.

The admin user account is created during HP CSA installation and is automatically assigned the CSA Administrator role. Refer to the *HP Cloud Service Automation Configuration Guide* for more information about this user (including the default password and how to change the default password).

The CSA Administrator has access to all areas (**Organizations**, **Resources**, **Components**, **Designs**, **Offerings**, **Catalogs**, and **Operations**) of the Cloud Service Management Console.

Resource Supply Manager

The Resource Supply Manager creates and manages cloud resources, such as providers and resource offerings.

The Resource Supply Manager creates and manages providers by type, assigning resource offerings to providers of the same type. He also creates and manages resource pools and

environments.

The Resource Supply Manager creates and manages resource offerings by provider type and by category (a classification such as Application, Compute, or Security). He can assign lifecycle actions and associate the resource offering to a provider. Resource offerings are also bound to a service design by the Service Designer.

The Resource Supply Manager has access to the **Resources** area of the Cloud Service Management Console.

Service Business Manager

The Service Business Manager creates and manages the service offerings and service catalogs.

The Service Business Manager customizes a service design (created by the Service Designer) to create a service offering. He adds a name, description, image, pricing, and documents and modifies the subscriber options of a service design to create a unique service offering. The Service Business Manager also manages each service offering he creates.

The Service Business Manager creates service catalogs to which his service offerings are published. This catalog is then made available to the Service Consumer who requests or subscribes to the services offered. The Service Business Manager also manages the service catalog by updating its contents (publishing or unpublishing service offerings) or removing the catalog, making it unavailable to Service Consumers.

The Service Business Manager has access to the **Catalogs** and **Offerings** areas of the Cloud Service Management Console.

Service Designer

The Service Designer designs, implements, and maintains service designs (also referred to as blueprints), component palettes, component types, and component templates.

The Service Designer creates a blueprint of an orderable service by creating service components, lifecycle actions, and subscriber options, and by binding a service design to a resource offering. The service design is used by the Service Business Manager to create a service offering.

The Service Designer has access to the **Components** and **Designs** areas of the Cloud Service Management Console.

Service Operations Manager

The Service Operations Manager views and manages subscriptions and service instances.

The Service Operations Manager can view subscriptions and requests for individual users. He can view details about a specific subscription, including properties and values, service topology, event

log, and resource providers. He can also transfer one or more subscriptions from one subscriber to another within the same organization.

The Service Operations Manager has access to the **Operations** area of the Cloud Service Management Console.

Consumer Organization Role

The consumer organization role authorizes access to the Marketplace Portal.

Service Consumer

The Service Consumer requests and manages subscriptions offered to his organization through the Marketplace Portal. From the Marketplace Portal, the Service Consumer can browse catalogs, subscribe to services, view subscriptions, and approve/deny subscription requests. The Service Consumer cannot log in to the Cloud Service Management Console.

Summary of Access by Role

The following table shows a summary of access to the Cloud Service Management Console functional areas by provider organization roles.

Summary of Access to the Cloud Service Management Console by Role

Role	Catalogs	Offerings	Components	Designs	Resources	Operations	Organizations
Consumer Service Administrator							✓
CSA Administrator	✓	✓	✓	✓	✓	✓	✓
Resource Supply Manager					✓		
Service Business Manager	✓	✓					

Summary of Access to the Cloud Service Management Console by Role, continued

Role	Catalogs	Offerings	Components	Designs	Resources	Operations	Organizations
Service Designer			✓	✓			
Service Operations Manager						✓	

Email Notifications

An email notification is sent when there is a change to the subscription status, when a request needs to be approved or denied, or when a request has been approved or denied. The automatically-generated email message is sent to users who have been configured to receive notifications. The same email notification is also sent to the Marketplace Portal and can be viewed in the **Notifications** area of the Marketplace Portal. In order for these email notices to be sent, the SMTP Server Setting must be configured for the organization.

From the Email Notifications page, configure the SMTP server used to send email notifications. You can also configure the sender for the organization email notifications and text added to the beginning of the subject line of the notification.

For more information about organizations, see "What are Organizations?" on page 30

To configure the mail server for HP Cloud Service Automation

Note: If you are configuring HP CSA to be compliant with FIPS 140-2, configure HP CSA for FIPS 140-2 compliance before configuring this item. Refer to the *Configure HP CSA for FIPS 140-2 Compliance* section of the *HP Cloud Service Automation Configuration Guide* for more information.

1. In the organization's navigation frame, select **Email Notifications**.
2. Provide or update the following information:

SMTP Server Settings

Item	Description
Hostname	The fully-qualified domain name (server.domain.com) or IP address of the SMTP-compliant mail server that acts as the gateway for email notifications.
Port	The port used to connect to the mail server when sending email notifications. The default SMTP port number of 25 should be changed only if your email server has been specifically configured using a non-standard port.

Connection Security

Item	Description
SSL	If the mail server is configured to require https (http over SSL), select the **SSL** checkbox.
Requires Authentication	If the mail server requires you to log in before accessing it, select the **Requires Authentication** checkbox and provide the following information: ■ **User ID**: User whose account is used to email notifications from the mail server. ■ **Password**: Password of the user account.

Email Source Settings

Item	Description
Sender Email Name	Email address to be used as the sender of the email notification.
Subject Prefix	Text added to the beginning of the subject line of the email notification.

3. Click **Save**.

Operations

The operations section allows you to configure operational settings and notifications for your organization.

Note: This section is not available to the provider organization.

To configure operations settings for an organization

1. In the organization's navigation frame, select **Operations**.

2. Provide or update the following information, and then click **Save**.

Item	Description
Provisioning Error Handling	Select one of the following: • **Fail Subscriptions On Provisioning Errors** - When an error occurs during provisioning, the configured Failure substate actions run, and the subscription is marked as Failed in both the Marketplace Portal and the Operations area of the Cloud Service Management Console. • **Pause Subscriptions On Provisioning Errors** - When an error occurs during provisioning, the provisioning process stops, and the subscription is marked as Pending in the Marketplace Portal and as Paused in the Operations area of the Cloud Service Management Console. You can troubleshoot the cause of the failure and then resume or cancel the paused subscription. For more information, see the topic "View Service Topology for a Subscription" in the Operations Help. **Note:** The resume behavior is different for subscriptions created from sequence-based and topology-based designs. Because topology-based designs in CSA 4.0 involve a single call to Cloud OS to provision the topology design, a failure, followed by a resume, of the provisioning will result in a brand new Cloud OS provisioning of the design. This is in contrast to most sequence-based designs, which contain fine-grained lifecycle actions, in which the provisioning is able to resume from the specific lifecycle action that failed during deployment and not repeat actions that have already succeeded.

Item	Description
Paused Subscription Notifications	Select any of the following that apply: • **Notify Subscribers** - The first time a subscription is paused, subscribers receive an email message (as configured in "Email Notifications" on page 53 for the consumer organization), and a notification displays in the Marketplace Portal. • **Notify Operators** - Whenever a subscription is paused, operator users receive an email notification (as configured in "Email Notifications" on page 53 for the CSA-Provider organization).
Operator Users To Notify When Paused	This section lists the user names and email addresses of operator users who have been configured to be notified when a subscription is Paused. To add operator users to notify when a subscription is paused: 1. Click **Add Operator Users**, and do one of the following: ▪ Select one or more operator users, which are members of the Service Operations Manager role as configured for the CSA-Provider organization in "Access Control" on page 47. This list shows users who have logged into the Cloud Service Management Console at least one time, are LDAP users, and are members of the Service Operations Manager role as configured for the CSA-Provider organization in "Access Control" on page 47. Note that if a user has logged in and has been recently added to the role, it may take 30 minutes (based on the default LDAP cache configuration value in the `csa.properties` file) for the user to appear in the selection list. If the user you want to add has not yet logged in to the Cloud Service Management Console or is recently added to the Service Operations Manager role, you can manually add the user by typing a user name, as described below. ▪ Or, enter a user name manually by typing a user name in the text field. 2. Click **Add**.

Catalogs

View the catalogs that are associated with this organization (if you manage more than one organization, this view filters the catalogs you manage by organization). This is a read-only view.

The global catalog (denoted by the ((•)) icon) is visible to all organizations, including the provider organization.

Delete an Organization

For more information about organizations, see "What are Organizations?" on page 30

To delete an organization

Only consumer organizations may be deleted. In order to successfully delete a consumer organization, it must not have any active consumer catalogs.

1. In the left navigation frame, select the organization to delete.
2. In the organization's navigation frame, select **General Information**.
3. Click **Delete**.
4. In the **Delete Organization?** dialog, click **Yes** to delete the organization.

Resources

Use this section of the Cloud Service Management Console to manage the following:

- Providers (see "Providers" on the next page)
- Resource Offerings (see "Resource Offerings" on page 84)

To set up providers and resource offerings for a service design

Before you design a service, you must set up the providers and (for sequenced designs) resources offerings required to deploy the service. Follow these high-level steps:

1. Set up providers.
   a. Create provider types, as needed (see "Create a Provider Type" on page 80), or use out-of-the-box provider types.

   b. Create providers, as needed (see "Create a Provider" on page 61).

   c. Create custom properties for providers, if desired (see "Create Custom Provider Properties" on page 75).

   d. Create environments, if desired (see "Create an Environment" on page 82).
      i. Associate the environments with the providers, if desired (see "Associate or Dissociate Environments with a Provider" on page 65).

   e. Create resource pools, if desired (see "Create a Resource Pool" on page 67).

2. Set up resource offerings.
   a. Create categories, if desired (see "Create a Category" on page 114), or use out-of-the-box categories.

   b. Create resource offerings (see "Create a Resource Offering" on page 87).
      i. Associate providers with resource offerings (see "Associate or Dissociate Providers with a Resource Offering" on page 94).

      ii. Create custom properties for resource offerings, if desired (see "Create Custom Resource Offering Properties" on page 110).

      iii. Create lifecycle actions for resource offerings, as needed (see "Create a Lifecycle Action for a Resource Offering" on page 99).

3. Design a service. For the high-level steps to design a sequenced service, see the topic "Sequenced Designs" in the Designs Help.

To use the resources interface

After you navigate away from the main providers or offerings list, return to the main list by selecting either **Providers** or **Offerings** in the left navigation pane, or by clicking the link in the upper right of the screen. For example, the link may say **Back to Providers by Environment** or **Back to Offerings by Type**.

Table columns can be sorted and resized, and the following toolbar icons are used in the **Resources** area:

Toolbar Icons

Icon	Description
	Click to refresh the data in this view.
	Click to edit the selected item.
	Click to create a new item.
	Click to make a copy of the selected item.
	Click to delete the selected item.
	Click to import a resource offering.
	Click to export the selected resource offering as a .zip file.
	Click to save the data in this table as a comma-separated-value (CSV) file.
	Type search text to filter the results displayed in this table. Press the x in the search field or press ESC to clear the search field.
	Click to open the online help.

Providers

Providers are managed in the Resources section of the Cloud Service Management Console. For more information, see "Resources" on the previous page.

Providers are management platforms that offer centralized control over the infrastructure and resources used in a cloud computing environment. For example, a provider such as HP Matrix Operating Environment infrastructure orchestration can deploy virtual machines, while a provider such as HP SiteScope can monitor applications.

A provider corresponds to the specific instance of an application that CSA can integrate with to help instantiate service designs. For example, to enable service designs that target HP Matrix Operating Environment infrastructure orchestration, you must first create a provider (with a provider type of HP Matrix Operating Environment) in the Cloud Service Management Console.

See the following related topics:

- "View Providers" below
- "Create a Provider" on the next page
- "Delete a Provider" on page 63
- "Associate or Dissociate Providers with an Environment" on page 84
- See the following topics for using the **Summary** tab for a provider:
  - "View Information About a Provider" on page 63
  - "Edit Properties of a Provider" on page 64
- See the following topics for using the **Offerings** tab for a provider:
  - "Associate or Dissociate Offerings with a Provider" on page 64
- See the following topics for using the **Environments** tab for a provider:
  - "Associate or Dissociate Environments with a Provider" on page 65
- For information about the **Resource Pools** tab for a provider, see "Resource Pools" on page 66.
- For information about the **Properties** tab for a provider, see "Custom Provider Properties" on page 74.

For general information about using the Resources interface, see "Resources" on page 58.

View Providers

For more information about providers, see "Providers" on the previous page.

To view providers

1. In the left navigation pane, select **Providers**.
2. Select **By Type** or **By Environment**.
3. From the list, select a **Type** or **Environment** whose providers you want to see. For example, select a provider type of **HP SiteScope** to see all providers associated with that type, or select an environment you have created, for example **East Coast**, to see all providers associated with that environment.
4. For descriptions of the specific properties, see the topic "Create a Provider" below.

Create a Provider

For more information about providers, see "Providers" on page 59.

> **Note:** The HP Cloud OS provider type is used specifically for topology designs and requires that a provider property "tenant" be configured on the provider. This tenant property is automatically created when creating a new Cloud OS Provider. To set its value, navigate to the **Properties** tab of the provider after it has been created, and edit the tenant property to contain the value appropriate for your Cloud OS environment.

To create a provider

1. In the left navigation pane, select **Providers**.
2. In the **By Type** tab, select the provider type for the provider you want to create.
3. In the toolbar, click the **Create** ( ) icon.
4. Provide the following information:

Item	Description
Display Name	The name you provide for the provider.
Description	The description you provide for the provider.

Item	Description
Type	The type selected for this provider. For more information, see "Provider Types" on page 78. Note that the Type cannot be changed after a provider is created.
User ID	The user ID for the specified Service Access Point.
Password	The password for the specified Service Access Point.
Retype Password	Retype to confirm the password.
Service Access Point	Specify a URL for connecting to the provider. The following examples show how to connect to some common resource providers: • HP Cloud OS - `http://<Cloud OS server IP>:5000` • HP Matrix Operating Environment - `https://<MOE server IP>:51443/hpio/controller/soap/<v1/v2/v3>` • HP Server Automation - `https://<SA server IP>:443` • HP SiteScope - `http://<SiteScope server IP>:8080` • HP Universal CMDB - `http://<Ucmdb server IP>:8080` • VMware vCenter - `https://<vCenter server IP>:443` When creating or updating a provider, HP CSA attempts to contact the provider at the URL you specify. HP CSA uses a six (6) second timeout to attempt to validate the provider URL (for HTTP and HTTPS only). If the URL is not successfully contacted before the timeout expires, a validation failure message displays, and you have the option to ignore the validation failure or to correct the URL and try again.
Availability	The availability value determines whether the provider will be selected when provisioning a new service. The availability is either **Enabled** or **Disabled**. When **Disabled**, the provider will not be selected when provisioning new services. Disabling a provider will have no effect on existing services that are using that provider. This field is not available when you initially create a provider, but after the provider is created you can edit its properties to change its availability. When a provider is created, the availability is set to **Enabled** by default.

Delete a Provider

For more information about providers, see "Providers" on page 59.

A provider referenced by topology designs or by topology or sequenced service instances cannot be deleted. All other providers can be deleted, and their associations (to environments and to offerings) are automatically removed on deletion. When deleting providers, make sure that any resource offerings referenced by the provider and used in a service design are still associated with at least one provider that can provision the resource offering.

To delete a provider

1. In the left navigation pane, select **Providers**.
2. In the **By Type** tab, select the provider type of the provider you want to delete.
3. In the Providers tab, highlight the provider you want to delete.
4. Click the **Delete** (✕) icon.
5. Click **Yes** to confirm the deletion.

View Information About a Provider

For more information about providers, see "Providers" on page 59.

To view information about a provider

1. In the left navigation pane, select **Providers**.
2. In the **By Type** tab, select the provider type of the provider you want to view.
3. Click the **Display Name** of the provider whose information you want to view.
4. See information about the provider in the following tabs:

- **Summary** tab, where you can see properties for a provider, as described in "Edit Properties of a Provider" on the facing page.

- **Offerings** tab, where you can associate resource offerings with providers. For more information, see "Associate or Dissociate Offerings with a Provider" below.
- **Environments** tab, where you can associate environments with providers. For more information, see "Associate or Dissociate Environments with a Provider" on the next page.
- **Resource Pools** tab, where you can see pools of resources that can be associated with providers. For more information, see "Resource Pools" on page 66.
- **Properties** tab, where you can see user-defined properties for a provider, as described in "Custom Provider Properties" on page 74.

Edit Properties of a Provider

For more information about providers, see "Providers" on page 59.

To edit a provider

1. In the **Providers** tab, click the **Display Name** of the provider you want to edit.
2. In the **Summary** tab, click the **Edit** ( ) icon.
3. Edit the properties of a provider, as desired. For descriptions of the specific properties, see the topic "Create a Provider" on page 61.

Associate or Dissociate Offerings with a Provider

For more information about providers, see "Providers" on page 59. For more information about offerings, see "Resource Offerings" on page 84.

To associate offerings with a provider

1. In the **Providers** tab, select the **Display Name** of the provider.
2. In the **By Type** tab, select the provider type of the provider.
3. In the **Offerings** tab, click the **Associate** (+) icon.
4. From the list of offerings, select one or more you want to associate with the provider.

5. Click **Associate**.
6. Click **Close**.

To dissociate offerings from a provider

1. In the **Providers** tab, select the **Display Name** of the provider.
2. In the **By Type** tab, select the provider type of the provider.
3. In the **Offerings** tab, highlight the row of one or more offerings to be dissociated.
4. Click the **Dissociate** (—) icon.
5. Click **Yes** to confirm.

Associate or Dissociate Environments with a Provider

For more information about providers, see "Providers" on page 59. For more information about environments, see "Environments" on page 81.

To associate environments with a provider

1. In the **Providers** tab, select the **Display Name** of the provider.
2. In the **Environments** tab, click the **Associate** (+) icon.
3. From the list of environments, select one or more you want to associate with the provider.
4. Click **Associate**.
5. Click **Close**.

To dissociate environments from a provider

1. In the **Providers** tab, select the **Display Name** of the provider.
2. In the **Environments** tab, highlight the row of one or more environments to be dissociated.
3. Click the **Dissociate** (—) icon.
4. Click **Yes** to confirm.

Resource Pools

Note: Resource pools can be used to help with resource allocation in sequenced designs. They are not applicable to topology designs.

Resource pools create an association between resources that can be provisioned by a provider and subscriptions. You can create a resource pool on a provider to represent a pool of resources associated with that provider. For example, you can create a resource pool on a VMware vCenter resource provider that corresponds to a VMware cluster. You can also model an HP Matrix Operating Environment infrastructure orchestration resource pool (a pool of CPU, memory, storage, and networking) as a CSA resource pool. You can decide which provider concepts, if any, you wish to model as CSA resource pools; the resource pool concept may not be applicable to all provider types.

When you model resources on a provider in resource pools, you should model them in one of the two fashions described below:

- A single resource pool on a resource provider that models all resources that can be allocated to CSA on this provider
- Multiple resource pools on a resource provider, each of which models its own portion of the total available resources on the provider. For example, if a provider has 2000 GB of Storage available, the sum of the Total Available To CSA for each resource of type Storage on all resource pools associated with the provider should be no greater than 2000 GB.

For general information about using the Resources interface, see "Resources" on page 58.

View Resource Pools

For more information about resource pools, see "Resource Pools" above.

1. In the left navigation pane, select **Providers**.
2. In the **By Type** tab, select the provider type of the provider whose resource pools you want to view.
3. Click the **Display Name** of the provider whose resource pools you want to view.

4. Select the **Resource Pools** tab.

5. For descriptions of the specific properties, see the topic "Create a Resource Pool" below.

Create a Resource Pool

For more information about resource pools, see "Resource Pools" on the previous page.

1. In the left navigation pane, select **Providers**.

2. In the **By Type** tab, select the provider type of the provider for which you want to create a resource pool.

3. Click the **Display Name** of the provider for which you want to create a resource pool.

4. Select the **Resource Pools** tab, and click the **Create** ( ) icon.

5. Provide the following information, and click **Save**:

Item	Description
Display Name	The name you provide for the resource pool.
Description	The description you provide for the resource pool.
Known By Provider As	The exact datacenter name as defined in the provider. For example, if the resource pool corresponds to a VMware vCenter cluster, this value would be the exact cluster name configured in VMware vCenter.
Availability	The availability is either **Enabled** or **Disabled**. When **Disabled**, the resource pool will not be available for allocation of resources for new subscriptions, but disabling a resource pool will have no effect on existing subscriptions.

Item	Description
Resource Synchronization Action	An action that updates the resources in the resource pool by communicating with the associated resource provider. For example, you can use this action to update the **Total Available To CSA** field of each resource configured on the resource pool based on the actual capacity of each resource as configured on the associated resource provider. For more information, see "Create a Resource for a Resource Pool" on page 71. The process definitions available in the list are process definitions that have been imported using the process definition tool with the access point type of RESOURCE_POOL_SYNC. For instructions about how to do this, see the section "Import HP Operations Orchestration Flows" in the *HP Cloud Service Automation Configuration Guide*. **Tip:** In the **Summary** tab of the resource pool property sheet, hover over the **Resource Synchronization Action** label to see the full path of the selected process definition in HP Operations Orchestration. The **Synchronize Now** button in the **Summary** tab of the resource pool property sheet invokes the resource synchronization action. **Note:** The resource synchronization action will run only when you explicitly invoke it, by clicking the **Synchronize Now** button, for example. Resource synchronization does not occur automatically and is performed only on demand. The default timeout for a resource synchronization action is one hour; the timeout is not configurable. The **Last Synchronized** field in the **Resource Pools** tab and in the **Summary** tab of the resource pool property sheet indicates the last time (local client time) a resource synchronization action on a resource pool completed successfully. You must refresh the **Resource Pools** tab for this value to be updated.

Delete a Resource Pool

For more information about resource pools, see "Resource Pools" on page 66.

A resource pool cannot be deleted unless the **Current CSA Utilization** for each resource configured on the pool is zero. For more information, see "Edit a Resource for a Resource Pool" on page 73.

1. In the left navigation pane, select **Providers**.
2. In the **By Type** tab, select the provider type of the provider for which you want to delete a resource pool.
3. Click the **Display Name** of the provider for which you want to delete a resource pool.
4. In the **Resource Pools** tab, find the resource pool you want to delete and click the **Delete** (✕) icon.
5. Click **Yes** to confirm the deletion.

View Properties of a Resource Pool

For more information about resource pools, see "Resource Pools" on page 66.

To view the properties of a resource pool

1. In the left navigation pane, select **Providers**.
2. In the **By Type** tab, select the provider type of the provider whose resource pools you want to view.
3. Click the **Display Name** of the provider whose resource pools you want to view.
4. Select the **Resource Pools** tab.
5. Click the **Display Name** of the resource pool whose properties you want to view.

Select one of the following tabs for more options:

- In the **Summary** tab, see the properties of the resource pool. For descriptions of the specific properties, see the topic "Create a Resource Pool" on page 67.
- In the **Resources** tab, you can view and manage resources for the resource pool. For more information, see "View Resources for a Resource Pool" on the facing page

Edit Properties of a Resource Pool

For more information about resource pools, see "Resource Pools" on page 66.

To edit a resource pool

1. In the left navigation pane, select **Providers**.
2. In the **By Type** tab, select the provider type of the provider for which you want to edit a resource pool.
3. Click the **Display Name** of the provider for which you want to edit a resource pool.
4. Select the **Resource Pools** tab, and select the **Display Name** of the resource pool you want to edit.
5. In the **Summary** tab, click the **Edit** ( ) icon.
6. Edit the properties as desired. For descriptions of the specific properties, see the topic "Create a Resource Pool" on page 67.

View Resources for a Resource Pool

For more information about resource pools, see "Resource Pools" on page 66.

Use the **Resources** tab of a resource pool to associate the following types of resources with a resource pool. You can also set capacity for the resources listed in the following table:

Resource	Unit of Measurement
CPU	Number of CPUs.
IPv4 Address	Number of IP version 4 addresses.
IPv6 Address	Number of IP version 6 addresses.
License	Number of license keys.
Memory	Megabytes (MB) of memory.

Resource	Unit of Measurement
Physical Server	Number of physical servers.
Power	Kilowatts (KW) of power.
Storage	Gigabytes (GB) of disk storage.
Subnet	Number of IPv4 or IPv6 subnets.
VLAN	Number of virtual LAN identifiers.
Virtual Server	Number of virtual servers.

To view resources for a resource pool

1. In the left navigation pane, select **Providers**.
2. In the **By Type** tab, select the provider type of the provider whose resource pool resources you want to view.
3. Click the **Display Name** of the provider whose resource pool resources you want to view.
4. Select the **Resource Pools** tab.
5. Click the **Display Name** of the resource pool whose resources you want to view.
6. Select the **Resources** tab. For descriptions of the specific properties for resources, see "Create a Resource for a Resource Pool" below.

Create a Resource for a Resource Pool

For more information about resource pools, see "Resource Pools" on page 66.

1. In the left navigation pane, select **Providers**.
2. In the **By Type** tab, select the provider type of the provider for which you want to create a resource pool resource.
3. Click the **Display Name** of the provider for which you want to create a resource pool resource.

4. Select the **Resource Pools** tab.
5. Click the **Display Name** of the resource pool whose resources you want to view.
6. Select the **Resources** tab.
7. Click **Add New Resource**.
8. Provide the following information:

Item	Description
Resource Type	Select a resource type to be included in this resource pool. Each resource type can be added to a resource pool one time; after a resource type is added to a pool, then it no longer appears in the drop-down list. Note that you cannot edit this value after the resource has been created.
Resource Availability	Select one of the following: **Available** - resource is available for selection during provisioning of a service. **Unavailable** - resource is not available for selection during provisioning of a service. **Unlimited** - resource is available for use with no restrictions on the number of allocations of this resource.
Total Available to CSA	Type a whole number to indicate the maximum capacity of this resource as provided to HP CSA by the provider. See "View Resources for a Resource Pool" on page 70 for a list of resources and their associated units of measurement. You cannot set this value if **Resource Availability** is set to **Unlimited**.
Current CSA Utilization	Type a whole number to indicate the current HP CSA utilization of this resource. HP CSA automatically adjusts this value as allocations occur, but you can also set this value manually if desired. You cannot set this value higher than the value specified for **Total Available to CSA**. See "View Resources for a Resource Pool" on page 70 for a list of resources and their associated units of measurement. Note that if the **Current CSA Utilization** for a resource is not zero (0), you will not be able to delete this resource or its associated resource pool. Also, you cannot edit this value when a new resource is initially created; however, you can edit it for an existing resource.

Edit a Resource for a Resource Pool

For more information about resource pools, see "Resource Pools" on page 66.

1. In the left navigation pane, select **Providers**.
2. In the **By Type** tab, select the provider type of the provider whose resource pool you want to edit.
3. Click the **Display Name** of the provider whose resource pool you want to edit.
4. Select the **Resource Pools** tab.
5. Click the **Display Name** of the resource pool whose resource you want to edit.
6. Select the **Resources** tab.
7. For the resource you want to edit, click the **Edit** ( ) icon.
8. Edit the properties as desired. For descriptions of the specific properties, see the topic "Create a Resource for a Resource Pool" on page 71.

Delete a Resource from a Resource Pool

You cannot delete a resource that is currently in use by HP CSA (that is, a resource that has a **Current CSA Utilization** value other than zero (0)).

For more information about resource pools, see "Resource Pools" on page 66.

1. In the left navigation pane, select **Providers**.
2. In the **By Type** tab, select the provider type of the provider whose resource pool contains the resource you want to delete.
3. Click the **Display Name** of the provider whose resource pool contains the resource you want to delete.
4. Select the **Resource Pools** tab.
5. Click the **Display Name** of the resource pool whose resource you want to delete.

6. Select the **Resources** tab.

7. For the resource you want to delete, click the **Delete** (✕) icon.

Custom Provider Properties

For more information about providers, see "Providers" on page 59.

Custom properties on a provider can be used to capture additional configuration information about a particular provider. For example, you can use custom properties to model provider resources, such as datacenters, hypervisors, and datastores for a specific VMware vCenter provider. When a sequenced design is provisioned, an HP Operations Orchestration flow can read and write provider property values during service provisioning. When a topology design is provisioned, the tenant property on the HP Cloud OS provider is inspected to influence the provisioning in HP Cloud OS.

Custom properties are optional, and if specified are used only by HP Operations Orchestration flows during service provisioning of sequenced designs or by HP Cloud OS during service provisioning of topology designs.

See the following related topics:

- "View Custom Provider Properties" below
- "Create Custom Provider Properties" on the next page
- "Delete Custom Provider Properties" on page 77
- "Edit Custom Provider Properties" on page 77

View Custom Provider Properties

For more information about custom properties for providers, see "Custom Provider Properties" above.

To view custom properties for a provider

1. In the left navigation pane, select **Providers**.

2. In the **By Type** tab, select the provider type of the provider you want to view.

3. Click the **Display Name** of the provider whose properties you want to view.
4. In the **Properties** tab, you can see the custom properties created for the provider.

Create Custom Provider Properties

For more information about custom properties for providers, see "Custom Provider Properties" on the previous page.

To create a custom property for a provider

1. In the left navigation pane, select **Providers**.
2. In the **By Type** tab, select the provider type of the provider whose custom property you want to create.
3. Click the **Display Name** of the provider whose custom property you want to create.
4. In the **Properties** tab, click the **Create** ( ) icon.
5. Provide the following information:

Item	Description
Property Type	Select one of the following: • **Boolean** - A property whose value is true or false. • **List** - A property whose value is a list of String values. • **Integer** - A property whose value is a positive or negative whole number or zero. • **String** - A property whose value is a sequence of characters. You cannot edit this value after the property has been created.

Item	Description
Property Details	***For Boolean properties:*** • **Name** - A unique name for the property. • **Display Name** - The display name for the property. • **Description** - A description of the property. • **Value** - Select **true** or **false**. ***For List properties:*** • **Name** - A unique name for the property. • **Display Name** - The display name for the property. • **Description** - A description of the property. • **Value Entry Method**: - Select **Manual Entry** to provide **Specified Values** for this field, as described below. • **Specified Values** - Click the **Add Value** (+) icon to add a new value, or click the **Remove Selected Value(s)** icon (—) to remove a selected value. ***For Integer properties***: • **Name** - A unique name for the property. • **Display Name** - The display name for the property. • **Description** - A description of the property. • **Value** - Select or type a positive or negative whole number or zero. If you enter a decimal number, the value will be truncated to the nearest integer. ***For String properties:*** • **Name** - A unique name for the property.

Item	Description
	• **Display Name** - The display name for the property. • **Description** - A description of the property. • **Value** - Type a string of characters. • **Confidential data** - Select this box to mask the values so that they cannot be read in the user interface; no encryption of the value is performed.

Delete Custom Provider Properties

For more information about custom properties for providers, see "Custom Provider Properties" on page 74.

To delete custom properties from a provider

1. In the left navigation pane, select **Providers**.
2. In the **By Type** tab, select the provider type of the provider whose custom properties you want to delete.
3. Click the **Display Name** of the provider whose custom properties you want to delete.
4. In the **Properties** tab, select the custom property you want to delete.
5. Click the **Delete** (✕) icon.
6. Click **Yes** to confirm the deletion.

Edit Custom Provider Properties

For more information about custom properties for providers, see "Custom Provider Properties" on page 74.

To edit custom properties for a provider

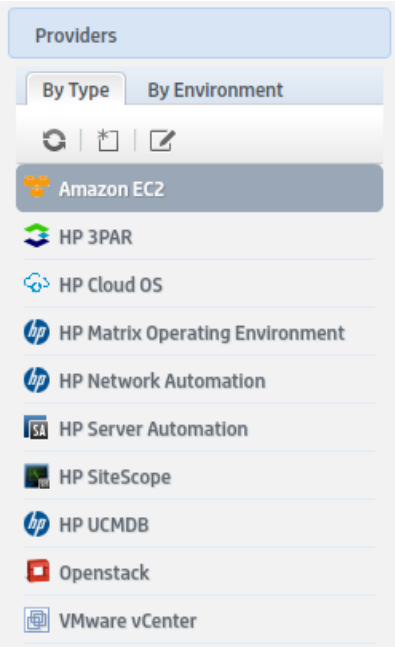
1. In the left navigation pane, select **Providers**.
2. In the **By Type** tab, select the provider type of the provider whose custom properties you want to edit.
3. Click the **Display Name** of the provider whose custom properties you want to edit.
4. In the **Properties** tab, click the **Name** of the property you want to edit.
5. Edit, as desired. For descriptions of the specific attributes, see "Create Custom Provider Properties" on page 75

Provider Types

For more information about providers, see "Providers" on page 59.

> **Note:** HP Cloud OS is a special provider type that is used for topology designs. You must have an HP Cloud OS provider configured prior to creating topology designs, and it must contain a tenant property that is set appropriately for your HP Cloud OS environment.

A provider type allows you to classify providers for improved filtering and identification. HP CSA includes some pre-defined, out-of-the-box provider types (shown below). Each instance of a provider can have a single provider type, and each instance of a resource offering can also have a single provider type. In addition, resource offerings can be associated only with providers that share the same provider type.



You can find the list of provider types by clicking **Providers** or **Offerings** in the left navigation pane, and then clicking the **By Type** or **By Provider Type** tab.

See the following related topics:

- "View Provider Types" below
- "Create a Provider Type" on the facing page
- "Delete a Provider Type" on the facing page
- "Edit Properties of a Provider Type" on page 81

For general information about using the Resources interface, see "Resources" on page 58.

View Provider Types

For more information about provider types, see "Provider Types" on the previous page.

1. In the left navigation pane, select **Providers** or **Offerings**.
2. Select the **By Type** or **By Provider Type** tab.
3. The list of provider types is displayed.

Create a Provider Type

For more information about provider types, see "Provider Types" on page 78.

1. In the left navigation pane, select **Providers** or **Offerings**.
2. In the left navigation pane select the **By Type** or **By Provider Type** tab.
3. In the left navigation pane toolbar, click the **Create** ( ) icon.
4. Provide the following information:

Item	Description
Display Name	The display name you provide for the provider type.
Description	The description you provide for the provider type.
Image	An image that displays for the provider type. Click **Change Image**. Choose the image you want, and click **Select**. Click **Upload Image** to add your own image. Supported file extensions include `.jpg`, `.jpeg`, `.gif`, and `.png`. The recommended image size is 256 by 256 pixels, and the image will be scaled to the appropriate size. The images are stored in the `%CSA_HOME%\jboss-as-7.1.1.Final\standalone\deployments\csa.war\images\library` folder of the HP CSA server.

Delete a Provider Type

For more information about provider types, see "Provider Types" on page 78

A provider type cannot be deleted if any offerings or providers are using it. Out-of-the-box provider types also cannot be deleted.

1. In the left navigation pane, select **Providers** or **Offerings**.
2. In the **By Type** or **By Provider Type** toolbar, click the **Edit** ( ) icon.
3. In the **Edit Provider Types** properties sheet, select the type you want to delete.

4. Click the **Delete** (✕) icon.
5. Click **Yes** to confirm the deletion.

Edit Properties of a Provider Type

For more information about provider types, see "Provider Types" on page 78.

To edit a provider type

1. In the left navigation pane, select **Providers** or **Offerings**.
2. In the **By Type** or **By Provider Type** toolbar, click the **Edit** (✎) icon.
3. In the **Edit Provider Types** properties sheet, click the **Display Name** of a provider type.
4. For descriptions of the specific properties, see the topic "Create a Provider Type" on the previous page.

Environments

For more information about providers, see "Providers" on page 59.

Environments are optional and provide a mechanism for grouping providers. The most common grouping patterns include grouping by geographical location or organizational structure. For example, you may want to group providers geographically and create environments such as *East Coast* or *South America*.

In addition, environments can be linked to a service catalogs to support distribution of resource provisioning. For example, you may want to group providers by their production readiness and create environments such as *Production*, *Development*, and *Test*.

Resource environments restrict the set of resource providers that can be chosen at subscription time. When provider selection occurs during service provisioning, only providers belonging to one or more of the environments associated with the service catalog will be eligible for selection. If no environments are associated with a service catalog, provider selection is not restricted based on environment membership.

See the following related topics:

- "View Environments" below
- "Create an Environment" below
- "Delete an Environment" on the next page
- "Edit Properties of an Environment" on the next page

For general information about using the Resources interface, see "Resources" on page 58.

View Environments

For more information about environments, see "Environments" on the previous page.

1. In the left navigation pane, select **Providers**.
2. Select the **By Environment** tab.
3. The environment list is displayed.
4. For descriptions of the specific properties, see the topic "Create an Environment" below.

Create an Environment

For more information about environments, see "Environments" on the previous page.

1. In the left navigation pane, select **Providers**.
2. In the **By Environment** toolbar, click the **Edit** ( ) icon.
3. In the **Edit Provider Environments** properties sheet, click the **Create** ( ) icon.
4. Provide the following information:

Item	Description
Display Name	The display name you provide for the environment.
Description	The description you provide for the environment.

Delete an Environment

For more information about environments, see "Environments" on page 81.

An environment can be deleted only if it is not associated with a service catalog. When an environment is deleted, its associations to providers are automatically removed.

1. In the left navigation pane, select **Providers**.
2. In the **By Environment** toolbar, click the **Edit** ( ) icon.
3. In the **Edit Provider Environments** properties sheet, select the environment you want to delete.
4. Click the **Delete** ( ) icon.
5. Click **Yes** to confirm the deletion.

Edit Properties of an Environment

For more information about environments, see "Environments" on page 81.

To edit an environment

1. In the left navigation pane, select **Providers**.
2. In the **By Environment** toolbar, click the **Edit** ( ) icon.
3. In the **Edit Provider Environments** properties sheet, click the **Display Name** of an environment.
4. For descriptions of the specific properties, see the topic "Create an Environment" on the previous page.
5. Click **Save**.
6. In the **Edit Provider Environments** properties sheet, click a number in the **# Catalogs** column to see a list of the catalogs that are configured to use an environment.

Associate or Dissociate Providers with an Environment

For more information about environments, see "Environments" on page 81.

To associate providers with an environment

1. In the left navigation pane, select **Providers**.
2. In the **By Environment** tab, select the environment with which you want to associate one or more providers.
3. In the **Providers** tab, click the **Associate** (+) icon.
4. In the **Unassociated Providers** list, highlight the row of one or more providers.
5. Click **Associate**.
6. Click **Close.**

To dissociate providers from an environment

1. In the left navigation pane, select **Providers**. In the **By Environment** tab, select the environment with which you want to dissociate one or more providers.
2. In the Providers tab, highlight the row of one or more providers to be dissociated.
3. Click the **Dissociate** (—) icon.
4. Click **Yes** to confirm.

Resource Offerings

> **Note:** Resource Offerings are used only with sequenced designs. They are not applicable to topology designs.

A resource offering links the capabilities of providers to the provisioning requirements of a service design. For example, you can create a resource offering that corresponds to a specific VMware vCenter VM template that can be cloned by CSA to create a VM.

A resource offering includes a user-specified set of lifecycle actions that is executed during the provisioning of the resource offering. A resource offering can also include actions that will be exposed to a Subscriber in the Marketplace Portal.

Resource offerings are associated with service designs through resource bindings. When a service design is provisioned, each resource binding (and associated resource offering) is processed through the CSA lifecycle. A provider that supports the resource offering is selected during the resource binding provisioning. For more information about resource bindings and provider selection, see the topic "Resource Bindings" in the Designs Help.

A resource offering may include one or more user-created properties that can be used to pass or exchange information with HP Operations Orchestration during the provisioning of the resource offering.

The following scenarios describe a few of the ways you can use resource offerings:

- A resource offering can be used to configure a *specific* capability offered by a provider (or a group of providers). For example, you can create a resource offering named `Red Hat 5.3 64-bit` that corresponds to a specific VMware vCenter VM template named `rhel53x64`, which when provisioned results in a Red Hat 5.3 64-bit VM being created. Such a resource offering would likely contain a user-created property, such as `VM_TEMPLATE_NAME`, that specifies the precise VM template name associated with the resource offering (in this case, `rhel53x64`). In this use of resource offerings, you need to create a resource offering for every VM template you wish to use in a service design.

- A resource offering can be used to configure a *general* capability offered by a provider (or a group of providers). For example, you can create a resource offering named `vCenter VM Template` that can be used to provision any VMware vCenter VM template. Such a resource offering requires that you create service component properties in the associated service designs that specify the precise VM template to be created. In this use of resource offerings, only a single resource offering is needed to expose VM template functionality to service designs.

- A resource offering can be used for the primary purpose of selecting a provider. Most resource offerings include lifecycle actions that are used to provision the resource offering, but some resource offerings have no such lifecycle actions and exist primarily to force provider selection in a resource binding. Typically, you would use this style of resource offering to select a provider at a group level in a service design (for example, for a Server Group) that is shared by all child components (for example, by all Server child components).

  In this approach, you create one resource offering for the Server Group, (for example `vCenter Server Group`) and a separate resource offering for the Servers (for example, `vCenter VM Template`). When associating `vCenter Server Group` to a Server Group, specify the provider

selection actions to execute in the Resource Binding. When associating `vCenter VM Template` to a Server, specify the **Select Resource Provider from Parent** or the **Select Resource Provider and Pool from Parent** action in the Resource Binding. In such an approach, the `vCenter Server Group` probably will not have lifecycle actions that are invoked automatically during provisioning; however, this resource offering may include actions to be exposed to a subscriber (for example, an action such as `Restart All VMs`).

A resource offering has a single provider type and a single category. For example, each of the resource offerings discussed above would have a provider type of VMware vCenter and a category of Compute.

A resource offering can be exported to a .zip file and imported to the same or different CSA installation. An exported resource offering includes all of its lifecycle actions and properties. For more information, see "Import and Export a Resource Offering" on page 88.

A resource offering can also be copied, which allows you to share a set of lifecycle actions and properties across a number of resource offerings. For more information, see "Copy a Resource Offering" on page 94.

See the following related topics:

- "View Resource Offerings" on the next page
- "Create a Resource Offering" on the next page
- "Copy a Resource Offering" on page 94
- "Delete a Resource Offering" on page 92
- For information about the **Summary** tab for an offering, where you can:
  - "View Properties of a Resource Offering" on page 93
  - "Edit Properties of a Resource Offering" on page 93
- See the following topics for information about the following tabs:
  - **Providers** tab: see "Associate or Dissociate Providers with a Resource Offering" on page 94.
  - **Lifecycle tab:** see "Lifecycle Actions for Resource Offerings" on page 95.
  - **Properties** tab: see "Custom Resource Offering Properties" on page 109.
  - Open the **Service Designs** tab for a read-only list of the service designs associated with the resource offering.

> **Note:** Be sure you do not confuse a resource offering with a service offering. A service offering is a CSA service design that is made available to a service catalog after additional information (such as pricing) has been added.

For general information about using the Resources interface, see "Resources" on page 58.

View Resource Offerings

For more information about resource offerings, see "Resource Offerings" on page 84.

To view resource offerings

1. In the left navigation pane, select **Offerings**.
2. In the **By Provider Type** or **By Category** tab, select a **Provider Type** or **Category** whose list of offerings you want to see. For example, select **HP SiteScope** to see all offerings associated with that provider type, or select **Application** to see all offerings associated with that category.
3. For descriptions of the specific properties, see the topic "Create a Resource Offering" below.

Create a Resource Offering

For more information about resource offerings, see "Resource Offerings" on page 84.

To create a resource offering

1. In the left navigation pane, select **Offerings**.
2. In the **By Provider Type** or **By Category** tab, select the provider type or category for the resource offering you want to create.
3. In the toolbar, click the **Create** ( ) icon.
4. Provide the following information:

Item	Description
Display Name	The name you provide for the offering.

Item	Description
Description	The description you provide for the offering.
Type	The provider type for this offering. For more information, see "Provider Types" on page 78. This field cannot be changed after an offering is created.
Category	The category for this offering. For more information, see "Categories" on page 113. This field cannot be changed after an offering is created.

Import and Export a Resource Offering

For more information about resource offerings, see "Resource Offerings" on page 84.

For information about importing service designs, see the topic "Import and Export a Service Design Archive" in the Designs Help.

HP CSA allows for the exporting and importing of many of the artifacts that provide the basis for cloud automation. The export operation provides the ability to preserve the selected artifacts so they can be used to replicate the services on another system or to restore the artifacts. These exported archive files are preserved in an industry-standard zip archive file format.

Installing or replacing artifacts on the system is supported by import and update operations. The import behavior only adds artifacts, whereas the update operation replaces matching artifacts. See the **Importing and Exporting** section below for more information.

Before you import a resource offering

Recommended best practices

1. Create a backup of your system or data. Before proceeding, be sure to create a backup of any artifacts you may be affecting by using the export operation to save an archive zip file.

2. Since some of the import and update options are destructive to existing data, you need to make sure you understand the differences between the options available to ensure you choose the option that matches your expectations.

Import requirements and prerequisites

Resource categories and provider types

Resource categories (such as Compute) and provider types (such as VMware vCenter) are resolved first by **name** and second by **display name** during import of a resource offering. Out-of-the

box resource categories and provider types have identical **name** values on all installations of HP CSA, and automatically resolve correctly during import. User-created resource categories and provider types do not have a **name** match on different installations of HP CSA, and instead are resolved by **display name**. For example, if a user created resource category with a display name of Auditing is used for a resource offering, when that resource offering is imported on another HP CSA installation, an attempt will be made to match a resource category with a **display name** of Auditing. This match is successful only if the user has already created this corresponding resource category on the system in which the import occurs. If a resource category or provider type cannot be resolved by either **name** or **display name**, a new resource category or provider type is automatically created during import of the resource offering. There is no need to add user-created resource categories and provider types ahead of time on the import system; however, if you have done so, ensure the **display name** values used match those on the export system.

Process Definitions

During an import operation, required dependencies may not exist on the system, which produces an import error that identifies the missing dependencies. For resource offerings this can include missing process definitions. These process definitions must be imported to the HP CSA installation in which the resource offering will be imported. During import, process definitions are resolved by **name**. For process definitions that are associated with the HP Operations Orchestration process engine, the **name** corresponds to the full path to the HP Operations Orchestration flow (for example, `/Library/CSA/3.2/Providers/vCenter/vCenter Clone Server/Actions/vCenter Simple Compute - Deploy`). Make sure that all these flows have been imported prior to importing resource offerings. Make sure that these flows have identical signatures and identical paths as the flows on the system from which the resource offering was exported. For instructions about how to import HP Operations Orchestration flows, see the section "Import HP Operations Orchestration Flows" in the *HP Cloud Service Automation Configuration Guide*.

Importing and Exporting

Import process for resource offerings

Resource offerings that have the same resource category, provider type, properties, and actions are considered to be functionally equivalent and are not imported.

Update process for resource offerings

During the update process, identical resource offerings that exist on the target system are updated (overwritten) with changes from the archive. New resource offerings are created if they do not exist on the target system. Note that resource offerings are identified by name instead of functional equivalence for update operation.

Update preserving original process for resource offerings

This process imports the resource offering, whether it exists on the target system or not. During this operation, if there is a resource offering with the same name in the system, the name, the display name, and the description of the resource offering are modified internally; the display name and the description are appended with "Superseded on" and the date. The name, display name, and description of the artifact being imported remain intact.

Content archive for resource offerings

Exporting a resource offering creates a content archive (.zip) file. The content archive contains XML documents for the resource offering you are exporting, as well as icons for customizing the artifacts, and the Manifest XML document, which contains meta-information about the archive files.

To import a resource offering

1. In the left navigation pane, select **Offerings**.
2. In the **Offerings** tab, click the **Import** ( ) icon.
3. Select or specify the **Archive File** (.zip file) that contains the resource offering you want to import. Archive filenames for resource offerings begin with `RESOURCE_OFFERING_`.
4. Select an **Option**:
   a. **Import** - imports new resource offerings; does not update existing resource offerings.
   b. **Update** - imports new resource offerings and updates (overwrites) existing resource offerings. The **Update** process uses the resource offering name to determine if the resource offering already exists on the target system. Check **Preserve Originals** to create a backup copy of the original items, appending "Superseded on" and the date to the artifact display names and descriptions.
5. Click **Preview** to see a report of prospective results for the import process, including information about the artifacts and their status.
6. Click **Import**.
7. Click **View Detailed Report** to see a summary and details of the import process, including information about the artifacts and their status.
8. Click **Yes**.

To export a resource offering

1. In the left navigation pane, select **Offerings**.
2. In the **By Provider Type** or **By Category** tab, select a **Provider Type** or **Category**.

3. In the **Offerings** tab, highlight the resource offering you want to export, and click the **Export** ( ) icon.
4. Save the exported resource offering, if required by your browser.

The resource offerings are packaged in an archive file whose name is:

RESOURCE_OFFERING_<resource_offering_display_name>_<resource_offering_id>.zip

How HP CSA identifies matching artifacts

When you import a resource offering, HP CSA determines if a functionally equivalent resource offering already exists on the system. If a functionally equivalent resource offering exists, then the import may be skipped depending on the options selected. Functional equivalence is determined by comparing the imported resource offering with other resource offerings that exist on the system, as follows:

- At a high level, two resource offerings are functionally equivalent if they share the same Provider Type and Resource Category, the same set of user defined custom properties, and the same set of lifecycle actions.
- Properties are considered equivalent if they share the same Type, Name, and Value (or Values for List properties).
- Lifecycle actions are considered equivalent if they share the same process definition, lifecycle state and substate, execution order, and action input properties and values.
- There are some additional attributes on properties and lifecycle actions that must be identical for equivalence.

For more specifics on the precise requirements for resource offering equivalence as it relates to entries in the .zip file produced during resource offering export, see the following table:

Element	Necessary for Equivalence
property	• name • valueType • values • confidential – only for String property types

Element	Necessary for Equivalence
action	• processDefinition name • lifecycleState name • lifecycleSubstate name • lifecycleExecOrder • errorOnTimeout • failOnError • timeout • all properties must be identical, including the consumerVisible and consumerReadOnly elements for each property • consumerVisible
resourceCategory	• isCriticalSystemObject determines if this is an out -of-box resourceCategory. If true, name determines equivalence, otherwise displayName determines equivalence.
providerType	• isCriticalSystemObject determines if this is an out -of-box providerType. If true, name determines equivalence, otherwise displayName determines equivalence.

For more information about importing and exporting HP CSA artifacts, see the *HP CSA Content Archive Tool* document.

Delete a Resource Offering

For more information about resource offerings, see "Resource Offerings" on page 84.

An offering cannot be deleted if it is used in a service design. When an offering is deleted, its associations to providers are automatically removed.

To delete a resource offering

1. In the left navigation pane, select **Offerings**.
2. In the **By Provider Type** or **By Category** tab, select a **Provider Type** or **Category**.
3. In the **Offerings** tab, select the offering you want to delete.
4. Select the **Delete** (✕) icon.
5. Click **Yes** to confirm the deletion.

View Properties of a Resource Offering

For more information about resource offerings, see "Resource Offerings" on page 84.

To view the properties of a resource offering

1. In the **Offerings** tab, click the **Display Name** of the offering whose properties you want to view.
2. Click the following tabs to see information about resource offerings:

- **Summary** tab, where you can see properties for an offering, as described in "Edit Properties of a Resource Offering" below
- **Providers** tab. For more information, see "Associate or Dissociate Providers with a Resource Offering" on the facing page.
- **Lifecycle** tab. For more information, see "Lifecycle Actions for Resource Offerings" on page 95.
- **Properties** tab. For more information, see "Custom Resource Offering Properties" on page 109.
- **Service Designs** tab for a read-only list of the service designs associated with the resource offering.

Edit Properties of a Resource Offering

For more information about resource offerings, see "Resource Offerings" on page 84.

To edit a resource offering

1. In the **Offerings** tab, click the **Display Name** of the offering you want to edit.
2. In the **Summary** tab, click the **Edit** ( ) icon.
3. For descriptions of the specific properties, see the topic "Create a Resource Offering" on page 87.

Copy a Resource Offering

For more information about resource offerings, see "Resource Offerings" on page 84.

To copy a resource offering

1. In the **Offerings** tab, highlight the resource offering you want to copy.
2. Click the **Copy** ( ) icon.

After you copy a resource offering, any changes you make to the original or to the copy will not affect the other.

Associate or Dissociate Providers with a Resource Offering

For more information about resource offerings, see "Resource Offerings" on page 84. For more information about providers, see "Providers" on page 59.

For a resource offering to be successfully provisioned at subscription ordering time, at least one resource provider must be associated with the resource offering. Additional restrictions exist if resource environments are associated to service catalogs; for more information, see "Environments" on page 81

When you associate an offering with a provider, the following must be true for successful provisioning:

- The associated providers support the offering and can deploy it when a service instance is provisioned.

- If an offering is associated with multiple providers, the offering must be exactly the same on each of the associated providers. For example, the VMware vCenter template must be exactly the same on all the associated providers.

To associate providers with a resource offering

For an offering to be used in service designs, it must be associated with at least one provider.

1. In the **Offerings** tab, select the **Display Name** of the offering.
2. In the **Providers** tab, click the **Associate** (+) icon.
3. From the list of providers, select one or more you want to associate with the offering.
4. Click **Associate**.

To dissociate providers from a resource offering

1. In the **Offerings** tab, select the **Display Name** of the offering.
2. In the **Providers** tab, highlight the row of one or more providers to be dissociated.
3. Click the **Dissociate** (—) icon.
4. Click **Yes** to confirm.

Lifecycle Actions for Resource Offerings

For more information about resource offerings, see "Resource Offerings" on page 84.

What is a resource offering lifecycle?

The **Lifecycle** tab allows you to specify the lifecycle actions that are needed to provision and de-provision resource offerings. A lifecycle action provides a link from a resource offering to an internal or external process definition, which runs to perform a specified action. The collection of actions defined for a resource offering is known as its lifecycle. In the following diagram you can see the resource offering lifecycle states, which are discussed in more detail below

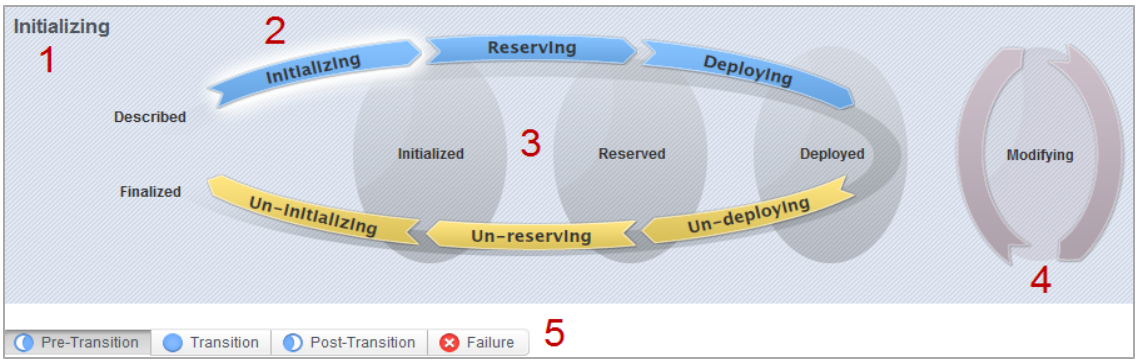


Image legend:

- 1 - Currently selected state
- 2 - Transition states
- 3 - Stable states
- 4 - Modifying state
- 5 - Substates

What is a lifecycle action?

A lifecycle action is a function that is either run automatically at a specified lifecycle state or substate, or that is exposed to the subscriber. Lifecycle actions contain the following information:

- A reference to a process definition, which contains the logic for executing the function.
- The property values that are inputs to the process definition.

What are lifecycle states?

A lifecycle state represents a step within the CSA service provisioning and de-provisioning lifecycles. States are either transition states or stable states.

- The following *transition states* are represented in the diagram as curved, arrow icons:
  - Initializing
  - Reserving
  - Deploying
  - Un-deploying

  - Un-reserving
  - Un-initializing
- The following *stable states* (except for Described and Finalized) are represented in the diagram as shaded, oval icons:
  - Described - lifecycle actions cannot be specified at this state
  - Initialized
  - Reserved
  - Deployed
  - Finalized - lifecycle actions cannot be specified at this state

What is a modifying state?

The modifying state is a special transition state that indicates a subscriber has chosen to modify a subscription, and the changes are being processed by the lifecycle engine. The modifying state is shown in the diagram to the right of the other lifecycle states.

The only service components that are processed during the modifying state are those service components that have a Subscriber Option property that gets its value directly from a target binding, or those service components that have a source binding that gets its value indirectly from such a target binding.

The only resource offerings that are processed during the modifying state are those associated with service components that are processed during the modifying state.

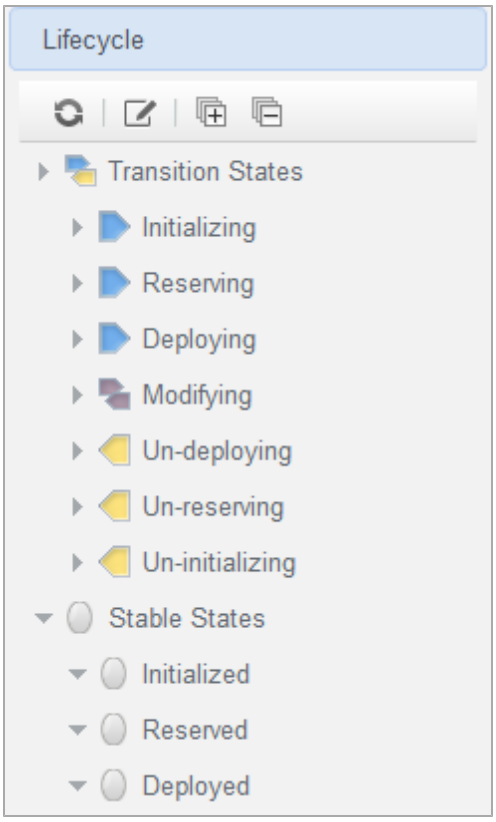
What are lifecycle substates?

A lifecycle substate is a further refinement of a lifecycle transition state. Stable states do not have substates. When defining a lifecycle action at a transition state, you must also specify the substate for the action. Substates are represented in the diagram as tabs just beneath the lifecycle diagram. The *substates* are:

- Pre-Transition
- Transition
- Post-Transition
- Failure

To see the list of all lifecycle actions for a resource offering:

1. In the left navigation pane, select **Offerings**.
2. In the **Offerings** tab select the **Display Name** of the offering for which you want to see a list of lifecycle actions.
3. In the **Lifecycle** tab, in the right pane (shown below) click the **Expand All** ( ) icon. In the list, you can see all lifecycle actions configured for each state and substate.



See the following related topics:

- "View Properties of a Lifecycle Action for a Resource Offering" on the next page
- "Create a Lifecycle Action for a Resource Offering" on the next page
- "Delete a Lifecycle Action from a Resource Offering" on page 104
- "Edit Properties of a Lifecycle Action for a Resource Offering" on page 105
- "Move a Lifecycle Action for a Resource Offering" on page 108

For general information about using the Resources interface, see "Resources" on page 58.

View Properties of a Lifecycle Action for a Resource Offering

For more information about lifecycles, see "Lifecycle Actions for Resource Offerings" on page 95.

To view the properties of a lifecycle action for a resource offering

1. In the left navigation pane, select **Offerings**.
2. In the **Offerings** tab select the **Display Name** of the resource offering whose lifecycle action properties you want to view.
3. In the **Lifecycle** tab, select the lifecycle state that contains the lifecycle action whose properties you want to view. For more information about states and substates, see "Lifecycle Actions for Resource Offerings" on page 95.
4. Select the lifecycle substate (located directly beneath the lifecycle state diagram), if applicable, that contains the lifecycle action whose properties you want to view.
5. From the list of actions, select the **Display Name** of the lifecycle action whose properties you want to view.
6. For descriptions of the properties in the **Summary** tab, see the topic "Create a Lifecycle Action for a Resource Offering" below. For descriptions of the properties in the **Properties** tab, see the topic "Edit Properties of a Lifecycle Action for a Resource Offering" on page 105.

Create a Lifecycle Action for a Resource Offering

For more information about lifecycles, see "Lifecycle Actions for Resource Offerings" on page 95.

Before you create lifecycle actions, be sure you have the latest process definitions from HP Operations Orchestration. For instructions about how to do this, see the section "Import HP Operations Orchestration Flows" in the *HP Cloud Service Automation Configuration Guide*.

To create a lifecycle action for a resource offering

1. In the left navigation pane, select **Offerings**.
2. In the **Offerings** tab select the **Display Name** of the offering for which you want to create a lifecycle action.
3. In the **Lifecycle** tab, on the lifecycle state diagram, select the lifecycle state in which you want to create an action. For more information about states and substates, see "Lifecycle Actions for Resource Offerings" on page 95.
4. Select the lifecycle substate (located directly beneath the lifecycle state diagram), if applicable, in which you want to create an action.
5. In the toolbar, select the Create ( ) icon.
6. Provide the information described in the table below.
7. After creating a new lifecycle action, specify values for the action input properties as described in "Edit Properties of a Lifecycle Action for a Resource Offering" on page 105.

Item	Description
Process Engine	Select a process engine, which is a container for process definitions. You can select either the Internal process engine or one of the HP Operations Orchestration (OO) engines.
Process Definition	Select a process definition, which is configured to run a specified internal action (see the table below for the list of internal actions) or external action.
Complete the following Identification fields:	
Display Name	The name you provide for the lifecycle action.
Description	The description you provide for the lifecycle action.
Marketplace Portal Options	These options are available only for actions created in stable lifecycle states. • Visible - Indicates that this lifecycle action will be available to be run in the Marketplace Portal.

Item	Description
Execution Order	The execution order for the lifecycle action, which is relative to other lifecycle actions for this lifecycle state or substate, if applicable. Lifecycle actions are executed in ascending order.
Execution Properties	Specify the following: • Fail on Error - If selected, this indicates that provisioning or de-provisioning will stop if the lifecycle action fails. The default selection is **false** for actions created in the Un-deploying, Un-reserving, and Un-initializing states. • Error on Timeout - If selected, this indicates that provisioning or de-provisioning will stop if the lifecycle action times out.
Timeout (seconds)	The time to wait until a timeout occurs for the lifecycle action. Set this field to zero (0) if you do not want the action to timeout.

See the following table for descriptions of the out-of-the-box internal actions that ship with CSA:

Internal Action	Description	Applies To
Build Resource Provider and Pool List	Builds a candidate list of resource providers and associated resource pools that meet the following requirements: • Support the resource offering referenced in a resource binding. • Have an **Availability** of **Enabled**. • If the service offering that references the service design with this action is in a service catalog with resource environments selected, the candidate list is further restricted to only include resource providers in one or more of the selected resource environments. • The provider's resource pool has sufficient resource capacity. To determine this, you must consider all measurable properties as configured in the **Measurable Properties** tab for the resource bindings, as well as the optional **Multiplier Property Name** field. The resource pool must have enough resource capacity to support all the properties, which requires that each necessary resource type (for example: CPU, Memory, and Storage), based on the measurable properties, be configured on the pool either with a **Resource Availability** of **Unlimited** or **Available**. If **Available**, the difference between **Total Available To CSA** and **Current CSA Utilization** must be sufficient to support the measurable property requirements.	• Resource Binding
Build Resource Provider List	Builds a candidate list of resource providers that meet the following requirements: • Support the resource offering referenced in a resource binding. • Have an **Availability** of **Enabled**. • If the service offering that references the service design with this action is in a service catalog with resource environments selected, the candidate list is further restricted to only include resource providers in one or more of the selected resource environments.	• Resource Binding

Internal Action	Description	Applies To
Clone Pattern	Clones a service component that is marked as a **Pattern** into one or more non-pattern service components. The number of service components created is determined by the value of the property specified in **Name of the Property for Service Component Count**.	• Service Component
Decrease Resource Utilization	Decreases the utilization of one or more resources in a resource pool by the values of the measurable properties configured on a resource binding. This action should be configured in the **Un-reserve** section of the **Resource Accounting** tab on a resource binding.	• Resource Binding
Increase Resource Utilization	Increases the utilization of one or more resources in a resource pool by the values of the measurable properties configured on a resource binding. This action should be configured in the **Reserve** section of the **Resource Accounting** tab on a resource binding.	• Resource Binding
Log Messages	Writes the user-specified Boolean Input, Integer Input, and String Input property values to the `csa.log` file. You can include this as an action on a Service Component, Resource Binding, or Resource Offering for use in troubleshooting.	• Resource Binding • Resource Offering • Service Component
Select Resource Pool from Provider	This internal action is deprecated and may be removed in a future HP CSA release. Use the **Select Resource Provider and Pool** action in conjunction with the **Build Resource Provider and Pool List** action in place of this action. Selects a resource pool from the set of resource pools associated with the selected resource provider. A resource pool must have an **Availability** of **Enabled** to be selected. The selected resource pool will be available to resource offering actions in the token `RSC_POOL_ID`.	• Resource Binding

Internal Action	Description	Applies To
Select Resource Provider	Selects a resource provider from the candidate list that was built by the **Build Resource Provider List** action. The selected resource provider will be available to resource offering actions in the token `RSC_PROVIDER_ID`. The selected provider will, optionally, be written to a property on the associated service component if the `Provider Property Name` input to the action is provided.	• Resource Binding
Select Resource Provider and Pool	Selects a resource pool and provider from the candidate list that was built by the **Build Resource Provider and Pool List** action. The selected resource provider and pool will be available to resource offering actions in the token `RSC_PROVIDER_ID` and `RSC_POOL_ID`, respectively. The selected pool will, optionally, be written to a property on the associated service component if the `Pool Property Name` input to the action is provided.	• Resource Binding
Select Resource Provider and Pool from Parent	Selects the resource pool and provider already chosen by a service component's parent service component, as identified by the `Parent Component ID` and `Pool Property Name` properties. The selected resource provider and pool will be available to resource offering actions in the token `RSC_PROVIDER_ID` and `RSC_POOL_ID` respectively. The selected pool will also be written to a `Pool Property Name` property on the associated service component.	• Resource Binding
Select Resource Provider from Parent	Selects the resource provider already chosen by a service component's parent service component, as identified by the `Parent Component ID` and `Provider Property Name` properties. The selected resource provider will be available to resource offering actions in the token `RSC_PROVIDER_ID`. The selected resource provider will also be written to a `Provider Property Name` property on the associated service component.	• Resource Binding

Delete a Lifecycle Action from a Resource Offering

For more information about lifecycles, see "Lifecycle Actions for Resource Offerings" on page 95.

To delete a lifecycle action from a resource offering

1. In the left navigation pane, select **Offerings**.
2. In the **Offerings** tab select the Display Name of the offering from which you want to delete a lifecycle action.
3. In the **Lifecycle** tab, on the lifecycle state diagram, select the lifecycle state from which you want to delete an action. For more information about states and substates, see "Lifecycle Actions for Resource Offerings" on page 95.
4. Select the lifecycle substate (located directly beneath the lifecycle state diagram), if applicable, from which you want to delete an action.
5. From the list of actions, highlight the action you want to delete.
6. In the toolbar, select the Delete (✕) icon.
7. Click **Yes** to confirm the deletion.

Edit Properties of a Lifecycle Action for a Resource Offering

For more information about lifecycles, see "Lifecycle Actions for Resource Offerings" on page 95.

To edit a lifecycle action for a resource offering

1. In the left navigation pane, select **Offerings**.
2. In the **Offerings** tab select the Display Name of the offering whose lifecycle action you want to edit.
3. In the **Lifecycle** tab, select the lifecycle state that contains the action you want to edit. For more information about states and substates, see "Lifecycle Actions for Resource Offerings" on page 95.
4. Select the lifecycle substate (located directly beneath the lifecycle state diagram), if applicable, that contains the action you want to edit.

5. From the list of actions, select the **Display Name** of the action whose properties you want to edit.

6. In the **Summary** tab, you can edit properties as described in the topic "Create a Lifecycle Action for a Resource Offering" on page 99.

7. In the **Properties** tab, you can specify action input properties whose values are passed to the process definition prior to invoking the action. Either type an input value or click the **Token** ( ) icon to select a token, which is a CSA system value that is automatically resolved internally when the property is read. Token values are available only for string properties and are not available for Boolean or integer properties. See the table below for a description of the tokens available for resource offering lifecycle actions.

8. Input properties for actions defined on stable states can also be marked as **Visible** or **Editable**:
   a. Visible - indicates that this input property can be made visible in the Marketplace Portal.

   b. Editable - indicates that this input property can be edited in the Marketplace Portal.

The following tokens are available for resource offering lifecycle actions:

Token	Description
Parent Service Component ID ([TOKEN:PRN_ COMPONENT_ID])	Resolves to the Service Component ID of the parent service component. The Service Component ID refers to the service component that the resource offering is associated with in a service design.
Resource Binding ID ([TOKEN:RSC_ BINDING_ID])	Resolves to the Resource Binding ID that was created at subscription time.
Resource Subscription ID ([TOKEN:RSC_ SUBSCRIPTION_ID])	Resolves to the Resource Subscription ID that was created from the Resource Offering at subscription time.
Selected Provider ID ([TOKEN:RSC_ PROVIDER_ID])	Resolves to the Provider ID that was selected at subscription time.

Token	Description
Selected Resource Pool ID ([TOKEN:RSC_POOL_ID])	Resolves to the Resource Pool ID that was selected at subscription time.
Service Blueprint ID ([TOKEN:SVC_BLUEPRINT_ID])	Resolves to the Service Blueprint ID.
Service Catalog ID ([TOKEN:SVC_CATALOG_ID])	Resolves to the Service Catalog ID that was used at subscription time.
Service Component ID ([TOKEN:SVC_COMPONENT_ID])	Resolves to the Service Component ID. The Service Component ID refers to the service component that the resource offering is associated with in a service design.
Service Component Type ([TOKEN:SVC_COMPONENT_TYPE])	Resolves to the Service Component Type (for example, Server). The Service Component Type refers to the service component that the resource offering is associated with in a service design.
Service Instance ID ([TOKEN:SVC_INSTANCE_ID])	Resolves to the Service Instance ID created at subscription time.
Service Offering ID ([TOKEN:SVC_OFFERING_ID])	Resolves to the Service Offering ID.
Service Request Organization ID ([TOKEN:REQ_ORG_ID])	Resolves to the Organization ID associated with the service request.
Service Request User ID ([TOKEN:REQ_USER_ID])	Resolves to the User ID associated with the service request.

Token	Description
Subscriber's Email Address ([TOKEN:SVC_SUBSCRIPTION_EMAIL])	Resolves to the subscriber's email address.
Subscriber's Organization ID ([TOKEN:USR_ORG_ID])	Resolves to the Organization ID associated with the subscriber.
Subscription ID ([TOKEN:SVC_SUBSCRIPTION_ID])	Resolves to the Subscription ID created at subscription time.

Move a Lifecycle Action for a Resource Offering

For more information about lifecycles, see "Lifecycle Actions for Resource Offerings" on page 95.

To move a lifecycle action for a resource offering

1. In the left navigation pane, select **Offerings**.
2. In the **Offerings** tab select the **Display Name** of the offering whose you lifecycle action you want to move.
3. In the **Lifecycle** tab, select the lifecycle state that contains the action you want to move. For more information about states and substates, see "Lifecycle Actions for Resource Offerings" on page 95.
4. Select the lifecycle substate (located directly beneath the lifecycle state diagram), if applicable, that contains the action you want to move.
5. From the list of actions, highlight the action you want to move.
6. In the toolbar, select the **Move** ( ) icon.
7. Provide the following information:

Item	Description
Target Lifecycle State	The new state for the lifecycle action.
Target Lifecycle Substate	The new substate, if applicable, for the lifecycle action. For more information about states and substates, see "Lifecycle Actions for Resource Offerings" on page 95.
Target Lifecycle Execution Order	The execution order for the lifecycle action relative to other lifecycle actions for this lifecycle state. Lifecycle actions are executed in ascending order.

Custom Resource Offering Properties

For more information about resource offerings, see "Resource Offerings" on page 84.

Custom properties for resource offerings are user-defined properties that are used for communicating properties and values to providers to customize the functional service they provide. The custom properties can be used to provide any information that is expected by an HP Operations Orchestration flow. For example, you can use custom properties for a resource offering to provide a specific `VM_TEMPLATENAME` value to an instance of VMware vCenter.

See the following related topics:

- "View Custom Resource Offering Properties" below
- "Create Custom Resource Offering Properties" on the facing page
- "Delete Custom Resource Offering Properties" on page 112
- "Edit Custom Resource Offering Properties" on page 112

View Custom Resource Offering Properties

For more information about custom offering properties, see "Custom Resource Offering Properties" above.

To view custom properties for a resource offering

1. In the left navigation pane, select **Offerings**.
2. In the **Offerings** tab, click the **Display Name** of the offering whose custom properties you want to view.
3. In the **Properties** tab, you can see the custom properties created for the offering.

Create Custom Resource Offering Properties

For more information about custom offering properties, see "Custom Resource Offering Properties" on the previous page.

To create a custom property for a resource offering

1. In the left navigation pane, select **Offerings**.
2. In the **Offerings** tab, click the **Display Name** of the offering whose custom properties you want to create.
3. In the **Properties** tab, click the **Create** ( ) icon.
4. Provide the following information:

Item	Description
Property Type	Select one of the following: • **Boolean** - A property whose value is true or false. • **List** - A property whose value is a list of String values. • **Integer** - A property whose value is a positive or negative whole number or zero. • **String** - A property whose value is a sequence of characters. You cannot edit this value after the property has been created.

Item	Description
Property Details	***For Boolean properties:*** • **Name** - A unique name for the property. • **Display Name** - The display name for the property. • **Description** - A description of the property. • **Value** - Select **true** or **false**. ***For List properties:*** • **Name** - A unique name for the property. • **Display Name** - The display name for the property. • **Description** - A description of the property. • **Value Entry Method**: - Select **Manual Entry** to provide **Specified Values** for this field, as described below. • **Specified Values** - Click the **Add Value** (+) icon to add a new value, or click the **Remove Selected Value(s)** icon (—) to remove a selected value. ***For Integer properties***: • **Name** - A unique name for the property. • **Display Name** - The display name for the property. • **Description** - A description of the property. • **Value** - Select or type a positive or negative whole number or zero. If you enter a decimal number, the value will be truncated to the nearest integer. ***For String properties:*** • **Name** - A unique name for the property.

Item	Description
	• **Display Name** - The display name for the property. • **Description** - A description of the property. • **Value** - Type a string of characters. • **Confidential data** - Select this box to mask the values so that they cannot be read in the user interface; no encryption of the value is performed.

Delete Custom Resource Offering Properties

For more information about custom properties for offerings, see "Custom Resource Offering Properties" on page 109.

To delete custom properties from a resource offering

1. In the left navigation pane, select **Offerings**.
2. In the **Offerings** tab, click the **Display Name** of the offering whose custom properties you want to delete.
3. In the **Properties** tab, select the custom properties you want to delete.
4. Click the **Delete** (✕) icon.
5. Click **Yes** to confirm the deletion.

Edit Custom Resource Offering Properties

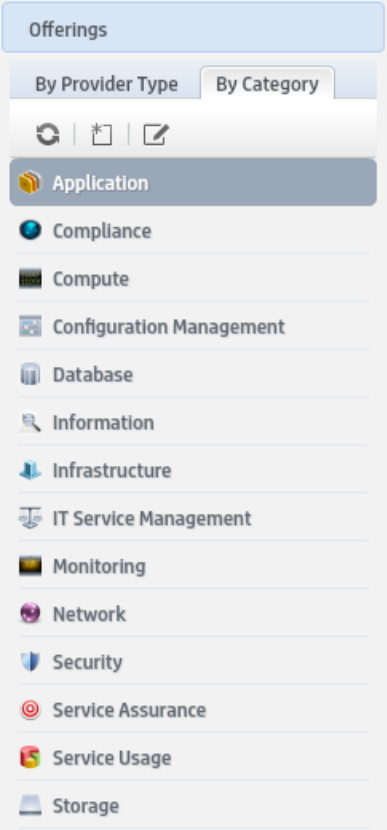
For more information about custom offering properties, see "Custom Resource Offering Properties" on page 109.

To edit custom properties for a resource offering

1. In the left navigation pane, select **Offerings**.
2. In the **Offerings** tab, click the **Display Name** of the offering whose custom properties you want to edit.
3. In the **Properties** tab, click the **Name** of the property you want to edit.
4. Edit, as desired. For descriptions of the specific attributes, see "Create Custom Provider Properties" on page 75

Categories

Categories allow you to classify resource offerings for improved filtering and identification. HP CSA includes some pre-defined categories out-of-the-box (shown below), or you can create your own. A category is associated with a resource offering and can be used when assigning resource offerings to service designs.



Service components within a service design can accept offering assignments only for those offerings with a category that is supported by the service component type. For example, a **Server** service component can be associated with offerings from a category of *Compute* (among others), while a **Software Application Service** component can be associated with offerings with a category of *Application*

Categories are available by clicking **Offerings** in the left navigation pane and selecting the **By Category** tab.

See the following related topics:

- "View Categories" below
- "Create a Category" below
- "Delete a Category" on the next page
- "Edit Properties of a Category" on page 116

For general information about using the Resources interface, see "Resources" on page 58.

View Categories

For more information about categories, see "Categories" on the previous page.

1. In the left navigation pane, select **Offerings**.
2. Select the **By Category** tab.
3. The categories list is displayed.

Create a Category

For more information about categories, see "Categories" on the previous page.

To create a category

1. In the left navigation pane, select **Offerings**.
2. In the left navigation pane, select the **By Category** tab.

3. In the left navigation pane toolbar, click the **Create** ( ) icon.

4. Provide the following information:

Item	Description
Display Name	The display name you provide for the category.
Description	The description you provide for the category.
Image	An image that displays for the category. Click **Change Image**. Choose the image you want, and click **Select**. Click **Upload Image** to add your own image. Supported file extensions include `.jpg`, `.jpeg`, `.gif`, and `.png`. The recommended image size is 256 by 256 pixels, and the image will be scaled to the appropriate size. The images are stored in the `%CSA_HOME%\jboss-as-7.1.1.Final\standalone\deployments\csa.war\images\library` folder of the HP CSA server.

Delete a Category

For more information about categories, see "Categories" on page 113.

A category cannot be deleted if any offerings are using it. Out-of-the-box categories also cannot be deleted.

To delete a category

1. In the left navigation pane, select **Offerings**.

2. In the **By Category** toolbar, click the **Edit** ( ) icon.

3. In the **Edit Categories** properties sheet, select the category you want to delete.

4. Click the **Delete** ( ) icon.

5. Click **Yes** to confirm the deletion.

Edit Properties of a Category

For more information about categories, see "Categories" on page 113.

To edit a category

1. In the left navigation pane, select **Offerings**.
2. In the **By Category** toolbar, click the **Edit** ( ) icon.
3. In the **Edit Categories** properties sheet, click the **Display Name** of a category.
4. For descriptions of the specific properties, see the topic "Create a Category" on page 114.

Components

Use this area of the Cloud Service Management Console to manage component palettes, component types, and component templates that will be used in sequenced service designs. A component (also known as a service component) represents one service design element required to realize a service subscription. It provides a framework to describe the actions and resource offerings required to realize, manage, and retire the service design.

Component Palettes

> **Note:** Component palettes are available only for component types that will be used in sequenced service designs and are not available for component types used in topology service designs.

Component palettes are the grouping structure for component types (described below). Each palette contains a group of component types you can choose from when creating service components in a service design. HP CSA ships with one out-of-the-box palette (called **HP CSA**). This palette allows you to reuse the out-of-the box component types, and templates, or you can create your own component palettes, types and templates from the base set, (with some restrictions). When creating component types from other palettes you must take care to prevent circular dependencies; however, conforming to suggested best practices can help you create palettes and component types to meet your organization's needs.

Component Types

A component type is a hierarchical classification of service components and is used in creating a service design. A component type contains rules that constrain how service designs can be constructed, helping a Service Designer to properly construct a service design. Component type constraints limit the types of service components that can be connected to components of this type within a service design. Resource category constraints limit the categories of resource offerings that can be bound to service components of this type.

HP CSA allows you to create your own component types and also ships with a number of out-of-the-box component types, as listed in the following table.

Out-of-the-Box Component Types

Component Type	Description	Component Type Constraints	Resource Category Constraints
Application Layer	Represents a logical installation and configuration unit of an application.	No component type constraints	No resource category constraints.
Infrastructure Service	Contains a collection of infrastructure components that are needed in a service design.	• Server • Server Group • Virtual Network	• Application • Compute • Configuration Management • Infrastructure • Monitoring • Network • Storage
Load Balancing Pool	Describes the membership of Servers in a pool that serves a load-balanced Software Application Service.	No component type constraints	• Compute • Network • Service Assurance • Service Usage
Network Connection	Describes the relationship of a Server interface to a Virtual Network.	No component type constraints	• Network

Out-of-the-Box Component Types, continued

Component Type	Description	Component Type Constraints	Resource Category Constraints
Platform Service	Represents a collection of infrastructure services that also provide middleware, databases, and other components required to host an application.	• Infrastructure Service	• Application • Compute • Configuration Management • Infrastructure • Monitoring • Network • Storage
Policy Enforcement Point	Describes the implementation of access control policies for a Virtual Network.	No component type constraints	• Compliance • Network • Security
Server	A virtual or physical server that is provisioned by CSA. Provides specific provisioning attributes for individual servers (can optionally be marked as **Pattern** when this service component is used in a service design).	• Application Layer • Network Connection • Software Component • Storage Volume	• Application • Compliance • Compute • Configuration Management • Monitoring • Network • Service Usage • Storage

Out-of-the-Box Component Types, continued

Component Type	Description	Component Type Constraints	Resource Category Constraints
Server Group	A container of identically configured Servers. Contains a single Server (marked as **Pattern** in a service design) that describes the shared characteristics of all Servers in the Server Group.	• Load Balancing Pool • Server (one Server, marked as **Pattern**) • Software Component	• Compute • Configuration Management • Infrastructure • Monitoring • Network • Storage
Service Composite	Often used as the root service component for service designs.	• Infrastructure Service • Platform Service • Software Application Service	• Application • Compute • Configuration Management • Infrastructure • Monitoring • Service Usage • Storage
Software Application Service	Represents a complex application architecture. Contains one or more Software Application Tier service components.	• Software Application Tier	• Application • Compliance • Configuration Management • Monitoring

Out-of-the-Box Component Types, continued

Component Type	Description	Component Type Constraints	Resource Category Constraints
Software Application Tier	Describes a type of software, or a collection of software, that is applied to all Servers within a Server Group.	• Server Group	• Application • Configuration Management • Monitoring
Software Component	Describes software deployed on an individual server.	No component type constraints	• Application • Monitoring
Storage Volume	Describes a single accessible storage area with a single file system.	No component type constraints	• Configuration Management • Monitoring • Service Usage • Storage
Virtual Network	Models a network infrastructure to which a network connection can be associated.	• Policy Enforcement Point	• Network • Service Usage

Component Templates

A component template is a specialized version of a component type and is used to simplify service design creation. Component templates include customized settings for properties and lifecycle actions normally created in a service design.

View Component Palettes

For more information about components, see "Components" on page 117.

To view component palettes

In the left pane of the **Components** area, view the available palettes. The list of component types contained in the selected palette displays in the right pane.

Use the following icons and features to navigate and perform tasks in the **Components** area:

Item	Description
	Indicates locked items, which cannot be edited or deleted. However, you can create component types and component templates from a locked component type.
	Type search text to filter the results.
	Click to display a tile view of the content.
	Click to display a list view of the content.
Refresh button	Click to refresh the data in this view.
	Click to manage component palettes. This is available only on the initial component palettes screen.
Create button	Click to add a new item.
+	Click to add a new item.
	Click to edit an item.
–	Click to delete an item.
	Click to export an item.
	Click to import an item.
	Hover your cursor over this icon to see more information.
	Hover your cursor over this icon to see more information about the error condition.

Create a Component Palette

For more information about components, see "Components" on page 117.

To create a component palette

1. In the left pane of the **Components** area, click the **Manage Palette** ( ) icon.
2. Click the **Add Palette** icon (+).
3. Provide information as described in the table below, and click **Create**.
4. Click **Done**.

Field	Description
Name	A unique name for the component palette. No white space is permitted; all letters are changed to upper case for this value. This field cannot be modified after a component palette has been created.
Display Name	The name that displays, for the component palette.
Description	The description for the component palette.
Image	An image that displays for the component palette. Click **Change Image**. Choose the image you want, and click **Select**. Click **Upload** to add your own image. Supported file extensions include `.jpg`, `.jpeg`, `.gif`, and `.png`. The recommended image size is 256 by 256 pixels, and the image will be scaled to the appropriate size. The images are stored in the `%CSA_HOME%\jboss-as-7.1.1.Final\standalone\deployments\csa.war\images\library` folder of the HP CSA server.

Edit a Component Palette

For more information about components, see "Components" on page 117.

You cannot edit a locked component palette, as designated by the locked ( ) icon.

To edit a component palette

1. In the left pane of the **Components** area, click the **Manage Palette** ( ) icon.
2. Select the palette you want to edit.

3. Click the **Edit Palette** icon ( ).
4. Provide the desired information, and click **Save**. For information about the specific fields, see "Create a Component Palette" on page 122.
5. Click **Done**.

Delete a Component Palette

For more information about components, see "Components" on page 117.

When you delete a palette, all of its component types (including all component properties, constraints, and templates) are deleted. The deletion can take a few minutes depending on the number of component types in the palette. Deletion of the component palette cannot be undone.

You cannot delete a component palette in the following cases:

- If the palette is locked, as designated by the locked ( ) icon.
- If any component type contained in the palette is being used in a service design.
- If any other component palette depends on the palette. That is, if another palette contains a component type that is based on a component type from the palette.

To delete a component palette

1. In the left pane of the **Components** area, click the **Manage Palette** ( ) icon.
2. Select the palette you want to delete.
3. Click the **Delete** icon (—).
4. Click **Yes** to confirm the deletion.
5. Click **Done**.

Import and Export a Component Palette

For more information about components, see "Components" on page 117.

Import process for component palettes

- The import process imports component palettes, including their associated component types, templates, and component type constraints.
- If the component palette already exists on the system (meaning that it has the same internal name as another palette on the system), it is updated with any added or removed component types, component templates, and component type constraints.
- Circular dependencies between palettes are not allowed. For example, Palette A cannot have components that are derived from Palette B while, at the same time, Palette B has components that are derived from Palette A.
- When importing multiple, dependent component palettes that already exist on the target system, it is recommended that you import the palettes in the order of their dependencies.
- The import process for component palettes always ensures system integrity with respect to component type derivation and property propagation. For example, say you have modified properties of a component type in a palette called "Palette A," and there are component types in other palettes that derive from this component type. When an update of 'Palette A' occurs during import, changes that have been made to the component types are propagated to component types in other palettes.

Content archive for component palettes

Exporting a component palette creates a content archive (.zip) file. The content archive contains XML documents for the component palette and its associated component types, component templates, and component type constraints. It also contains icons for customizing the artifacts, and the Manifest XML document, which contains meta-information about the archive files.

The import and export processes allow you to do the following:

To import a component palette

1. In the left pane of the **Components** area, click the **Manage Palette** ( ) icon.
2. Click the **Import** ( ) icon.
3. Select or specify the **Archive File** (.zip file) that contains the palette you want to import.
4. Select **Update** to import the palette and its component types (including properties, component type constraints, and templates). If a component type already exists on the target system, it is overwritten.

5. Click **Preview** to see a report of prospective results for the import process, including information about the artifacts and their status, as well as information about palette dependencies.
6. Click **Import**.
7. Click **View Detailed Report** to see a summary and details of the import process, including information about the artifacts and their status.
8. Click **Yes** to confirm the import.

To export a component palette

1. In the left pane of the **Components** area, click the **Manage Palette** ( ) icon.
2. Click the **Export** ( ) icon.
3. Click **Yes**.
4. Save the exported component palette, if required by your browser.

For more information about importing and exporting HP CSA artifacts, see the *HP CSA Content Archive Tool* document.

View Component Types

For more information about components, see "Components" on page 117.

To view component types

In the left pane of the **Components** area, select the palette that contains the component type you want to view. The list of component types contained in the selected palette displays in the right pane.

Use the following icons and features to navigate and perform tasks in the **Components** area:

Item	Description
	Indicates locked items, which cannot be edited or deleted. However, you can create component types and component templates from a locked component type.

Item	Description
	Type search text to filter the results.
	Click to display a tile view of the content.
	Click to display a list view of the content.
Refresh button	Click to refresh the data in this view.
	Click to manage component palettes. This is available only on the initial component palettes screen.
Create button	Click to add a new item.
+	Click to add a new item.
	Click to edit an item.
–	Click to delete an item.
	Click to export an item.
	Click to import an item.
	Hover your cursor over this icon to see more information.
	Hover your cursor over this icon to see more information about the error condition.

Create a Component Type

For more information about component types, see "Components" on page 117.

To create a component type

1. In the left pane of the **Components** area, select the component palette in which you want to create a component type.
2. At the bottom of the right pane, click **Create**.
3. Provide the following information, and click **Create.**

Item	Description
Base Component Type	Select the component palette from which you want to select a base component type, and then select a base component type from which the new component type will inherit properties and constraints. Component types are not required to have a **Base Component Type**. The lists display only component palettes and component types that are compatible with (that is, they do not create circular dependencies with) the palette in which you are creating the component type. This field cannot be modified after a base component type has been selected.
Name	A name for the component type. The component type name must be unique within a component palette. No white space is permitted; all letters are changed to upper case for this value. This field cannot be modified after a component type has been created.
Display Name	The name that displays for the component type.
Description	The description you provide for the component type.
Image	An image that displays for the component type. Click **Change Image**. Choose the image you want, and click **Select**. Click **Upload** to add your own image. Supported file extensions include `.jpg`, `.jpeg`, `.gif`, and `.png`. The recommended image size is 256 by 256 pixels, and the image will be scaled to the appropriate size. The images are stored in the `%CSA_HOME%\jboss-as-7.1.1.Final\standalone\deployments\csa.war\images\library` folder of the HP CSA server.

Item	Description
Default Settings	Select the following items as needed. These items specify the initial default values for service components: • **Consumer Visible** - Select this box to specify that, by default, the service component is visible in the Marketplace Portal. Deselect it to specify that the service component will not be visible. Properties and lifecycle actions that have been configured as consumer visible will only display in the Marketplace Portal if the associated service component itself is configured to be visible. The visibility of a service component does not affect visibility of its child service components, and it is not necessary for a parent of a service component to be visible for the child component to be visible in the Marketplace Portal. • **Pattern** - Select this box to mark the service component as a pattern by default. This indicates that the service component will not be automatically processed by the CSA lifecycle engine. When you create a pattern service component, you must also create a Clone Pattern action in the parent service component. For example, the out-of-the-box component type, Server, is typically marked as a pattern, and its parent service component, Server Group, includes the Clone Pattern action. At subscription time, the Clone Pattern action creates one or more service component instances from this service component pattern. • You can identify a service component that is marked as a pattern because its icon appears as a stacked, double image with a grid-like background, as shown below. 

View Component Type Details

For more information about components, see "Components" on page 117.

To view the details of a component type

1. In the left pane of the **Components** area, select the component palette that contains the component type whose details you want to view.
2. Click the component type whose details you want to view.
3. In the **Overview** tab, see the details of the component type. For descriptions of the specific properties, see the topic "Create a Component Type" on page 127.

You can also see component type information in the following tabs:

- **Properties** tab - for more information see the topic "View Component Type Properties" on the next page.
- **Constraints** tab - for more information see the topic "View Constraints of a Component Type" on page 137.
- **Templates** tab - for more information see the topic "View Component Templates" on page 139.

Edit a Component Type

For more information about components, see "Components" on page 117.

You cannot edit a component type if it part of a locked palette or if the component type is locked as a system critical object. In these cases, the **Edit** button is disabled in the **Overview** tab.

To edit a component type

1. In the left pane of the **Components** area, select the component palette that contains the component type you want to edit.
2. Click the component type you want to edit.
3. In the **Overview** tab, click **Edit**.
4. Edit the details of the component type, as desired. For descriptions of the specific fields, see the topic "Create a Component Type" on page 127.
5. Click **Save**.

Delete a Component Type

For more information about components, see "Components" on page 117.

You cannot delete a component type in the following cases:

- If it is part of a locked palette or if the component type is locked as a system critical object. In these cases, the **Delete** button is disabled in the **Overview** tab.
- If another component type is based on (derived from) the component type.
- If service components in service designs are based on this type.

To delete a component type

1. In the left pane of the **Components** area, select the component palette that contains the component type you want to delete.
2. Click the component type you want to delete.
3. In the **Overview** tab, click **Delete**.
4. Click **Yes** to confirm the deletion.

View Component Type Properties

For more information about components, see "Components" on page 117.

Properties for component types provide a base set of attributes that can be used and edited when creating service components in a service design. The value defined for a component type property is the default value exposed in the service design unless the service design uses a template, in which case, the template's property value is set as the default value in the service design.

To view the properties of a component type

1. In the left pane of the **Components** area, select the component palette that contains the component type whose properties you want to view.
2. Click the component type whose properties you want to view.
3. Select the **Properties** tab.

4. In the **Properties** tab, the properties are grouped into two lists:
   - **Defined Properties** - Properties created directly on this component type. You can delete, edit, and update defined properties and their values, unless the component is locked. In which case, only the property value can be set and the **Delete** button will be disabled for the property that is part of the locked component type.
   - **Inherited Properties** - Properties inherited from base parent and grandparent component types. Inherited properties cannot be deleted, and you can edit only the following for inherited properties:
     - Property values
     - **Consumer Visible** property
     - **Confidential Data** property
     - **Resource Type and Unit** property (for Integer property types only)
5. For more information about property details, see the topic "Create Component Type Properties" below.

You can also see component type information in the following tabs:

- **Overview** tab - for more information see the topic "View Component Type Details" on page 129.
- **Constraints** tab - for more information see the topic "View Constraints of a Component Type" on page 137.
- **Templates** tab - for more information see the topic "View Component Templates" on page 139.

Create Component Type Properties

For more information about components, see "Components" on page 117.

Caution: When you create a property for a component type that has derived subtype components or existing component templates, the property is added to all associated subtypes and templates. Because service designs are considered a snapshot in time of the components, and to preserve the integrity of service designs that are provisioned, the propagation of component type properties does not affect service designs. You must manually update any service design that uses the component type, its subtypes, or its templates.

To create component type properties

1. In the left pane of the **Components** area, select the component palette that contains the component type whose properties you want to create.
2. Click the component type whose properties you want to create.
3. Select the **Properties** tab.
4. At the bottom of the **Properties** tab, click **Create**. Provide the following information, and click **Create**.

Item	Description
Type	Select one of the following: • **Boolean** - A property whose value is true or false. • **List** - A property whose value is a list of String values. • **Integer** - A property whose value is a positive or negative whole number (or zero). • **String** - A property whose value is a sequence of characters. You cannot change the value of this field once the property has been created.
Depending on the **Type** selected above, provide the following information:	
Boolean	• **Name** - A unique name for the property. • **Display Name** - The label that will be displayed for the property. • **Description** - A description of the property. • **Property Value** - Select either **True** or **False**. • **Consumer Visible** - Select this box to indicate that this property will be made visible in the Marketplace Portal.

Item	Description
String	• **Name** - A unique name for the property. • **Display Name** - The label that will be displayed for the property. • **Description** - A description of the property. • **Property Value** - Type the value of the property. The value must be in string format. • **Consumer Visible** - Select this box to indicate that this property will be made visible in the Marketplace Portal. • **Confidential Data** - Select this box to mask the values so that they cannot be read in the Marketplace Portal; no encryption of the value is performed.
Integer	• **Name** - A unique name for the property. • **Display Name** - The label that will be displayed for the property. • **Description** - A description of the property. • **Resource Type and Unit for a Measurable Property** - Select the resource type and unit, which are used to influence provider and pool selection and resource accounting. You must set this to a value other than **None** to make this property measurable and available for configuration on a resource binding. You can also specify the resource type and unit simply to clarify the intent of the property. Note that when creating a **Source Binding** for a service component, a best practice is that both the service component property you are creating and the service component property you are binding to will have the same **Resource Type and Unit** value. When you change this value for a component type that has derived subtype components or existing component templates, the changes you make apply to all associated subtypes and templates. • **Property Value** - Type the value of the property. The value must be an integer. • **Consumer Visible** - Select this box to indicate that this property will be made visible in the Marketplace Portal.

Item	Description
List	• **Name** - A unique name for the property. • **Display Name** - The label that will be displayed for the property. • **Description** - A description of the property. • **Property Values** ▪ Click the **Add Value** (+) icon to add a new list item, and provide the following information: ○ **Display Name**- The label that will be displayed for the list item. ○ **Value** - The value of the list item. Values must be unique with a list. ○ **Description** A description of the list item. ○ Click **Create** to add the list item. • Click the **Edit** icon ( ) to edit a selected list item. • Click the **Remove** icon (—) to remove a selected list item. • **Consumer Visible** - Select this box to indicate that this property will be made visible in the Marketplace Portal.

Edit Component Type Properties

For more information about components, see "Components" on page 117.

For inherited properties, you cannot edit the following fields:

- Type
- Name
- Display Name
- Description
- Confidential Data

To edit component type properties

1. In the left pane of the **Components** area, select the component palette that contains the component type whose properties you want to edit.
2. Click the component type whose properties you want to edit.
3. Select the **Properties** tab.
4. In the **Properties** tab, select **Edit** for the property you want to edit.
5. Edit the properties of the component type, as desired. For descriptions of the specific fields, see the topic "Create Component Type Properties" on page 132.

Delete Component Type Properties

For more information about components, see "Components" on page 117.

> **Caution:** When you delete a property from a component type that has derived subtype components or existing component templates, the deletion applies to all associated subtypes and templates. Because service designs are considered a snapshot in time of the components, and to preserve the integrity of service designs that are provisioned, the propagation of component type properties does not affect service designs. You must manually update any service design that uses the component type, its subtypes, or its templates.

You cannot delete a component type property in the following cases:

- If the property is part of the original locked component type. In this case, in the component property **Defined Properties** list, the **Delete** button will be disabled. A locked property can also be identified when in the edit view. The locked icon will appear in the lower left hand corner of the edit dialog.
- If the property is inherited from another component type.

To delete component type properties

1. In the left pane of the **Components** area, select the component palette that contains the component type whose properties you want to delete.

2. Click the component type whose properties you want to delete.
3. Select the **Properties** tab.
4. In the Properties tab, select **Delete** for the property you want to delete.
5. Click **Yes** to confirm the deletion.

View Constraints of a Component Type

For more information about components, see "Components" on page 117.

Service Designers can configure two kinds of constraints for a component type: component type constraints and resource category constraints. These constraints apply to service components within a service design that are created from this component type.

Component type constraints limit the types of service components that can be connected to components of this type within a service design. For example, a service component of type Server may be allowed connections only to components of types Application Layer, Network Connection, Software Component, and Storage Volume.

Resource category constraints limit the categories of resource offerings that can be bound to service components of this type. For example, a Server service component may be allowed resource bindings only to resource offerings assigned the categories Application, Compliance, Compute, Configuration Management, Monitoring, Network, Service Usage, and Storage.

A component type can establish constraints in the following ways:

- *Defined constraints* - specified directly on component types.
- *Inherited constraints* - inherited by component types from the hierarchy of types they are derived from. In the list of constraints, the path of inheritance is listed next to the name of each component type.

To view the constraints of a component type

1. In the left pane of the **Components** area, select the component palette that contains the component type whose constraints you want to view.
2. Click the component type whose constraints you want to view.
3. Select the **Constraints** tab.

4. In the left pane of the **Constraints** tab, select the type of constraint you want to view.
5. In the right pane, view the list of constraints.

You can also see component type information in the following tabs:

- **Overview** tab - for more information see the topic "View Component Type Details" on page 129.
- **Properties** tab - for more information see the topic "View Component Type Properties" on page 131.
- **Templates** tab - for more information see the topic "View Component Templates" on the next page.

Add a Constraint

For more information about components, see "Components" on page 117.

For information about constraints, see "View Constraints of a Component Type" on the previous page.

To add constraint

1. In the left pane of the **Components** area, select the component palette that contains the component type to which you want to add a constraint.
2. Click the component type to which you want to add a constraint.
3. Select the **Constraints** tab.
4. In the left pane of the **Constraints** tab, select the type of constraint you want to add.
5. At the bottom of the right pane, click **Create**.
6. Select the desired constraint, and click **Add**.

Remove a Constraint

For more information about components, see "Components" on page 117.

For information about constraints, see "View Constraints of a Component Type" on page 137.

You cannot remove a constraint from a component type if the component type is locked. In addition, you cannot remove a constraint that is delivered by HP CSA; however, you can add constraints to the HP-CSA delivered component types, and then you can remove constraints that you added.

To remove a constraint

1. In the left pane of the **Components** area, select the component palette that contains the component type from which you want to remove a constraint.
2. Click the component type from which you want to remove a constraint.
3. Select the **Constraints** tab.
4. In the left pane of the **Constraints** tab, select the type of constraint you want to remove.
5. In the right pane of the **Components** tab, click **Remove** for the item you want to remove.

View Component Templates

For more information about components, see "Components" on page 117.

A component template is a specialized version of a component type and is used to simplify service design creation. Component templates include customized settings for the properties, lifecycle actions, and resource bindings that provide initial settings for the service design.

To view the templates that are based on a component type

1. In the left pane of the **Components** area, select the component palette that contains the component type whose templates you want to view.
2. Click the component type whose templates you want to view.
3. Select the **Templates** tab.
4. The **Templates** tab displays the list of templates created from the selected component type.

You can also see component template information in the following tabs:

- **Overview** tab - for more information see the topic "View Component Template Details" on page 143
- **Properties** tab - for more information see the topic "View Component Template Properties" on page 143.
- **Lifecycle** tab - for more information see the topic "View Component Template Lifecycle Actions" on page 149.
- **Resource Bindings** tab - for more information see the topic "View Component Template Resource Bindings" on page 155.

Use the following icons and features to navigate and perform tasks in the **Components** area:

Item	Description
	Indicates locked items, which cannot be edited or deleted. However, you can create component types and component templates from a locked component type.
	Type search text to filter the results.
	Click to display a tile view of the content.
	Click to display a list view of the content.
Refresh button	Click to refresh the data in this view.
	Click to manage component palettes. This is available only on the initial component palettes screen.
Create button	Click to add a new item.
+	Click to add a new item.
	Click to edit an item.
–	Click to delete an item.
	Click to export an item.
	Click to import an item.
	Hover your cursor over this icon to see more information.
	Hover your cursor over this icon to see more information about the error condition.

Create Component Templates

For more information about components, see "Components" on page 117.

To create component templates

1. In the left pane of the **Components** area, select the component palette that contains the component type from which you want to create a template.
2. Click the component type on which you want to base the template.
3. Select the **Templates** tab.
4. At the bottom of the **Templates** tab, click **Create**. Provide the following information, and click **Create**.

Item	Description
Base Component Type	The component type from which this template is created; this field cannot be edited.
Display Name	The name you that is displayed for the component template.
Description	The description you provide for the component template.
Image	The image for the component template.
Consumer Visible	Select this box to specify that the service component is visible in the Marketplace Portal. De-select it to specify that the service component will not be visible.
Pattern	Select this box to mark the service component as a pattern by default. When you create a pattern service component, you must also create a Clone Pattern action in the parent service component. For example, the out-of-the-box component type, Server, is typically marked as a pattern, and its parent service component, Server Group, includes the Clone Pattern action. At subscription time, the Clone Pattern action creates one or more service component instance from this service component pattern.

Edit Component Templates

For more information about components, see "Components" on page 117.

To edit component type templates

1. In the left pane of the **Components** area, select the component palette that contains the component type whose template you want to edit.
2. Click the component type that contains the template you want to edit.
3. Select the **Templates** tab.
4. Click the template you want to edit.
5. In the **Overview** tab, click **Edit**.
6. Provide the desired information, and click **Save**. For information about the specific fields, see "Create Component Templates" on the previous page.

Delete Component Templates

For more information about components, see "Components" on page 117.

To delete component type templates

1. In the left pane of the **Components** area, select the component palette that contains the component type whose templates you want to delete.
2. Click the component type whose templates you want to delete.
3. Select the **Templates** tab.
4. Select the template you want to delete
5. In the **Overview** tab, click **Delete**.
6. Click **Yes** to confirm the deletion.

View Component Template Details

For more information about components, see "Components" on page 117.

To view the details of a component template

1. In the left pane of the **Components** area, select the component palette that contains the component type whose template details you want to view.
2. Click the component type whose template details you want to view.
3. Select the **Templates** tab.
4. In the templates list, click the template whose details you want to view.
5. In the **Overview** tab, see the details of the component template. For descriptions of the specific details, see the topic "Create Component Templates" on page 141.

You can also see component template information in the following tabs:

- **Properties** tab - for more information see the topic "Create Component Template Properties" on the facing page.
- **Lifecycle** tab - for more information see the topic "View Component Template Lifecycle Actions" on page 149.
- ▪ **Resource Bindings** tab - for more information see the topic "View Component Template Resource Bindings" on page 155

View Component Template Properties

For more information about components, see "Components" on page 117.

To view the properties of a component template

1. In the left pane of the **Components** area, select the component palette that contains the component type whose template properties you want to view.
2. Click the component type whose template properties you want to view.
3. Select the **Templates** tab.

4. In the template list, click the component template whose properties you want to view.

5. In the **Properties** tab, the properties are grouped into two lists:
   - **Defined Properties** - Properties created directly on this component template. You can delete, edit, and update defined properties and their values. New component templates have no defined properties unless the component type is locked, in which case only the property value can be set in the template's properties.

   - **Inherited Properties** - Properties inherited from parent and grandparent component templates. You can edit only the values of inherited properties.

6. For more information about property details, see the topic "Create Component Template Properties" below.

You can also see component template information in the following tabs:

- **Overview** tab - for more information see the topic "View Component Template Details" on the previous page.

- **Lifecycle** tab - for more information see the topic "View Component Template Lifecycle Actions" on page 149.

- **Resource Bindings** tab - for more information see the topic "View Component Template Resource Bindings" on page 155

Create Component Template Properties

For more information about components, see "Components" on page 117.

To create component template properties

1. In the left pane of the **Components** area, select the component palette that contains the component type whose template properties you want to create.

2. Click the component type whose template properties you want to create.

3. Select the **Templates** tab.

4. In the component templates list, click the component template whose properties you want to create.

5. At the bottom of the **Properties** tab, click **Create**. Provide the following information, and click **Create**.

Item	Description
Type	Select one of the following: • **Boolean** - A property whose value is true or false. • **List** - A property whose value is a list of String values. • **Integer** - A property whose value is a positive or negative whole number (or zero). • **String** - A property whose value is a sequence of characters.
Depending on the **Type** selected above, provide the following information:	
Boolean	• **Name** - A unique name for the property. • **Display Name** - The label that will be displayed for the property. • **Description** - A description of the property. • **Property Value** - Select either **true** or **false**. • **Consumer Visible** - Select this box to indicate that this property will be made visible in the Marketplace Portal.

Item	Description
Integer	• **Name** - A unique name for the property. • **Display Name** - The label that will be displayed for the property. • **Description** - A description of the property. • **Resource Type and Unit** - Select the resource type and unit, which are used to influence provider and pool selection and resource accounting. You must set this to a value other than **None** to make this property measurable and available for configuration on a resource binding. You can also specify the resource type and unit simply to clarify the intent of the property. Note that when creating a **Source Binding** for a service component, a best practice is that both the service component property you are creating and the service component property you are binding to will have the same **Resource Type and Unit** value. • **Property Value** - Type the value of the property. The value must be an integer. • **Consumer Visible** - Select this box to indicate that this property will be made visible in the Marketplace Portal.

Item	Description
List	• **Name** - A unique name for the property. • **Display Name** - The label that will be displayed for the property. • **Description** - A description of the property. • **Property Value** ▪ Click the **Add Value** (+) icon to add a new list item, and provide the following information: ○ **Display Name**- The label that will be displayed for the list item. ○ **Value** - The value of the list item. ○ **Description** A description of the list item. ○ Click **Create** to add the list item. ▪ Click the **Edit** icon ( ) to edit the selected list item. ▪ Click the **Remove** icon (−) to remove a selected list item. • **Consumer Visible** - Select this box to indicate that this property will be made visible in the Marketplace Portal.
String	• **Name** - A unique name for the property. • **Display Name** - The label that will be displayed for the property. • **Description** - A description of the property. • **Property Value** - Type the value of the property. The value must be in string format. • **Consumer Visible** - Select this box to indicate that this property will be made visible in the Marketplace Portal. • **Confidential data** - Select this box to mask the values so that they cannot be read in the Marketplace Portal; no encryption of the value is performed.

Edit Component Template Properties

For more information about components, see "Components" on page 117.

For inherited properties, you cannot edit the following fields:

- Type
- Name
- Display Name
- Description
- Confidential Data

To edit component template properties

1. In the left pane of the **Components** area, select the component palette that contains the component type whose template properties you want to edit.
2. Click the component type whose template properties you want to edit.
3. Select the **Templates** tab.
4. In the component templates list, click the component template whose properties you want to edit.
5. In the **Properties** tab, select the property you want to edit, and click **Edit**.
6. Edit the properties of the component template, as desired. For descriptions of the specific fields, see the topic "Create Component Template Properties" on page 144.

Delete Component Template Properties

For more information about components, see "Components" on page 117.

You cannot delete a component template property in the following cases:

- If the property is locked, as designated by the locked ( ) icon.
- If the property is inherited.

To delete component template properties

1. In the left pane of the **Components** area, select the component palette that contains the component type whose template properties you want to delete.
2. Click the component type whose template properties you want to delete.
3. Select the **Templates** tab.
4. In the templates list, click the template whose properties you want to delete.
5. In the **Properties** tab, select the property you want to delete, and click **Delete**.
6. Click **Yes** to confirm the deletion.

View Component Template Lifecycle Actions

For more information about components, see "Components" on page 117.

For more information about lifecycle actions, see the topic "Lifecycle Actions for Service Components" in the Designs Help.

To view the lifecycle actions of a component template

1. In the left pane of the **Components** area, select the component palette that contains the component type whose template lifecycle actions you want to view.
2. Click the component type whose template lifecycle actions you want to view.
3. Select the **Templates** tab
4. In the template list, click the component template whose lifecycle actions you want to view.
5. In the **Lifecycle** tab, click the **Expand All** ( ) icon in the right pane. In the list, you can see all lifecycle actions configured for each state and substate.

You can also see component template information in the following tabs:

- **Overview** tab - for more information see the topic "View Component Template Details" on page 143.

- **Properties** tab - "View Component Template Properties" on page 143
- ▪ **Resource Bindings** tab - for more information see the topic "View Component Template Resource Bindings" on page 155

Create a Lifecycle Action for a Component Template

For more information about components, see "Components" on page 117.

Before you create lifecycle actions, be sure you have the latest process definitions from HP Operations Orchestration. For instructions about how to do this, see the section "Import HP Operations Orchestration Flows" in the *HP Cloud Service Automation Configuration Guide*.

To create a lifecycle action for a component template

1. In the left pane of the **Components** area, select the component palette that contains the component type whose template lifecycle actions you want to create.
2. Click the component type whose template lifecycle actions you want to create.
3. Select the **Templates** tab
4. In the template list, click the component template whose lifecycle actions you want to create.
5. Click the **Lifecycle** tab.
6. On the lifecycle state diagram, select the lifecycle state for which you want to create an action. For more information about states and substates, see the topic "Lifecycle Actions for Service Components" in the Designs Help.
7. Select the lifecycle substate (located directly beneath the lifecycle state diagram), if applicable.
8. Select the **Create** icon ( ).
9. Provide the information described in the table below.

Item	Description
Process Engine	Select a process engine, which is a container for process definitions. You can select either the Internal process engine or one of the HP Operations Orchestration (OO) engines.
Process Definition	Select a process definition, which is configured to run a specified internal action (see the table below for the list of internal actions) or external action.
Complete the following Identification fields:	
Display Name	The name you provide for the lifecycle action.
Description	The description you provide for the lifecycle action.
Marketplace Portal Options	These options are available only for actions created in stable lifecycle states. • Visible - Indicates that this lifecycle action will be available to be run in the Marketplace Portal.
Execution Order	The execution order for the lifecycle action, which is relative to other lifecycle actions for this lifecycle state or substate, if applicable. Lifecycle actions are executed in ascending order.
Execution Properties	Specify the following: • Fail on Error - If selected, this indicates that provisioning or de-provisioning will stop if the lifecycle action fails. The default selection is **false** for actions created in the Un-deploying, Un-reserving, and Un-initializing states. • Error on Timeout - If selected, this indicates that provisioning or de-provisioning will stop if the lifecycle action times out.
Timeout (seconds)	The time to wait until a timeout occurs for the lifecycle action. Set this field to zero (0) if you do not want the action to timeout.

See the following table for descriptions of the out-of-the-box internal actions that ship with CSA:

Internal Action	Description	Applies To
Build Resource Provider and Pool List	Builds a candidate list of resource providers and associated resource pools that meet the following requirements: • Support the resource offering referenced in a resource binding. • Have an **Availability** of **Enabled**. • If the service offering that references the service design with this action is in a service catalog with resource environments selected, the candidate list is further restricted to only include resource providers in one or more of the selected resource environments. • The provider's resource pool has sufficient resource capacity. To determine this, you must consider all measurable properties as configured in the **Measurable Properties** tab for the resource bindings, as well as the optional **Multiplier Property Name** field. The resource pool must have enough resource capacity to support all the properties, which requires that each necessary resource type (for example: CPU, Memory, and Storage), based on the measurable properties, be configured on the pool either with a **Resource Availability** of **Unlimited** or **Available**. If **Available**, the difference between **Total Available To CSA** and **Current CSA Utilization** must be sufficient to support the measurable property requirements.	• Resource Binding
Build Resource Provider List	Builds a candidate list of resource providers that meet the following requirements: • Support the resource offering referenced in a resource binding. • Have an **Availability** of **Enabled**. • If the service offering that references the service design with this action is in a service catalog with resource environments selected, the candidate list is further restricted to only include resource providers in one or more of the selected resource environments.	• Resource Binding

Internal Action	Description	Applies To
Clone Pattern	Clones a service component that is marked as a **Pattern** into one or more non-pattern service components. The number of service components created is determined by the value of the property specified in **Name of the Property for Service Component Count**.	• Service Component
Decrease Resource Utilization	Decreases the utilization of one or more resources in a resource pool by the values of the measurable properties configured on a resource binding. This action should be configured in the **Un-reserve** section of the **Resource Accounting** tab on a resource binding.	• Resource Binding
Increase Resource Utilization	Increases the utilization of one or more resources in a resource pool by the values of the measurable properties configured on a resource binding. This action should be configured in the **Reserve** section of the **Resource Accounting** tab on a resource binding.	• Resource Binding
Log Messages	Writes the user-specified Boolean Input, Integer Input, and String Input property values to the `csa.log` file. You can include this as an action on a Service Component, Resource Binding, or Resource Offering for use in troubleshooting.	• Resource Binding • Resource Offering • Service Component
Select Resource Pool from Provider	This internal action is deprecated and may be removed in a future HP CSA release. Use the **Select Resource Provider and Pool** action in conjunction with the **Build Resource Provider and Pool List** action in place of this action. Selects a resource pool from the set of resource pools associated with the selected resource provider. A resource pool must have an **Availability** of **Enabled** to be selected. The selected resource pool will be available to resource offering actions in the token `RSC_POOL_ID`.	• Resource Binding

Internal Action	Description	Applies To
Select Resource Provider	Selects a resource provider from the candidate list that was built by the **Build Resource Provider List** action. The selected resource provider will be available to resource offering actions in the token `RSC_PROVIDER_ID`. The selected provider will, optionally, be written to a property on the associated service component if the `Provider Property Name` input to the action is provided.	• Resource Binding
Select Resource Provider and Pool	Selects a resource pool and provider from the candidate list that was built by the **Build Resource Provider and Pool List** action. The selected resource provider and pool will be available to resource offering actions in the token `RSC_PROVIDER_ID` and `RSC_POOL_ID`, respectively. The selected pool will, optionally, be written to a property on the associated service component if the `Pool Property Name` input to the action is provided.	• Resource Binding
Select Resource Provider and Pool from Parent	Selects the resource pool and provider already chosen by a service component's parent service component, as identified by the `Parent Component ID` and `Pool Property Name` properties. The selected resource provider and pool will be available to resource offering actions in the token `RSC_PROVIDER_ID` and `RSC_POOL_ID` respectively. The selected pool will also be written to a `Pool Property Name` property on the associated service component.	• Resource Binding
Select Resource Provider from Parent	Selects the resource provider already chosen by a service component's parent service component, as identified by the `Parent Component ID` and `Provider Property Name` properties. The selected resource provider will be available to resource offering actions in the token `RSC_PROVIDER_ID`. The selected resource provider will also be written to a `Provider Property Name` property on the associated service component.	• Resource Binding

Delete a Lifecycle Action from a Component Template

For more information about components, see "Components" on page 117.

To delete a lifecycle action from a component template

1. In the left pane of the **Components** area, select the component palette that contains the component type whose template lifecycle action you want to delete.
2. Click the component type whose template lifecycle action you want to delete.
3. Select the **Templates** tab
4. In the template list, click the component template whose lifecycle action you want to delete.
5. Click the **Lifecycle** tab.
6. On the lifecycle state diagram, select the lifecycle state from which you want to delete an action. For more information about states and substates, see the topic "Lifecycle Actions for Service Components" in the Designs Help.
7. Select the lifecycle substate (located directly beneath the lifecycle state diagram), if applicable.
8. In the toolbar, select the Delete (✕) icon.
9. Click **Yes** to confirm the deletion.

View Component Template Resource Bindings

For more information about components, see "Components" on page 117.

To view the resource bindings of a component template

1. In the left pane of the **Components** area, select the component palette that contains the component type whose template resource bindings you want to view.
2. Click the component type whose template resource bindings you want to view.
3. Select the **Templates** tab.
4. In the templates list, click the component template whose resource bindings you want to view.
5. In the **Resource Bindings** tab, you can see the list of resource bindings for the component template.

You can also see component template information in the following tabs:

- **Overview** tab - for more information see the topic "View Component Template Details" on page 143.
- **Properties** tab - "View Component Template Properties" on page 143
- **Lifecycle** tab - for more information see the topic "View Component Template Lifecycle Actions" on page 149.

To create a resource binding on a service component

1. In the left pane of the **Components** area, select the component palette that contains the component type whose template resource binding you want to create.
2. Click the component type whose template resource binding you want to create.
3. Select the **Templates** tab.
4. In the component templates list, click the component template whose resource binding you want to create.
5. At the bottom of the **Resource Bindings** tab, click **Create**.
6. In the **Create New Resource Binding** wizard, provide the information described in see the topic "Create a Resource Binding" in the Designs Help.

To edit properties of a resource binding on a component template

1. In the left pane of the **Components** area, select the component palette that contains the component type whose template resource binding you want to edit.
2. Click the component type whose template resource binding properties you want to edit.
3. Select the **Templates** tab.
4. In the component templates list, click the component template whose resource binding properties you want to edit.

5. Click the **Resource Bindings** tab.
6. Select the display name of the resource binding you want to edit.
7. In the Summary tab, click the **Edit** ( ) icon.
8. Edit the properties of the resource binding, as desired. For descriptions of the specific properties, see the topic "Edit Properties of a Resource Binding" in the Designs Help.

Delete a Component Template Resource Binding

- For more information about components, see "Components" on page 117.

To delete a resource binding from a component template

1. In the left pane of the **Components** area, select the component palette that contains the component type whose template resource binding you want to delete.
2. Click the component type whose template resource binding you want to delete.
3. Select the **Templates** tab.
4. In the templates list, click the component template whose resource binding you want to delete.
5. In the **Resource Bindings** tab, select the resource binding you want to delete, and click **Delete**.
6. Click **Yes** to confirm the deletion.

You can also see component template information in the following tabs:

- **Overview** tab - for more information see the topic "View Component Template Details" on page 143.
- **Properties** tab - "View Component Template Properties" on page 143
- **Lifecycle** tab - for more information see the topic "View Component Template Lifecycle Actions" on page 149.

Designs

Use the **Designs** area of the Cloud Service Management Console to manage service designs, which are the recipes for automating the cloud. You can create the following types of designs:

- **Sequenced Design** - Sequenced designs specify directed execution of service component lifecycles. Use sequenced designs for complex services and services that rely on run book automation, such as integrations with legacy data center systems. Create a sequenced design as a directed component hierarchy to define lifecycle execution. Sequenced designs use components to group multiple automation providers within a single entity. Sequenced designs permit explicit specification of lifecycle actions.

- **Topology Design** - Topology designs specify components and their relationships to define the service lifecycle. Use topology designs for straightforward Infrastructure as a Service (IaaS) deployments. Create a topology design in a free-form component layout where connection relationships implicitly define the service fulfillment lifecycle. Each topology design binds to a single provider for fulfillment automation. Topology designs delegate lifecycle sequencing to providers.

Sequenced Designs

A sequenced service design is a blueprint for an orderable service. Each design includes service components created from component types or component templates that define what is provisioned automatically. You can use service designs to create a complex set of automated elements to support consistency and repeatability of common manual tasks. These service designs then become the basis for service offerings, which support ITIL and ITSM best practices. A sequenced service design includes the following:

- A hierarchy of service components (see "Service Components" on page 168). The hierarchy of service components defines the execution process. In HP CSA the hierarchy defines the connection rules, but the **Component Order** configured for each service component defines the order of execution that occurs when this design is provisioned.

- Resource bindings (see "Resource Bindings" on page 181, which allow resource offerings to be assigned to service components.

- Lifecycle actions (see "Lifecycle Actions for Service Components" on page 197, which are needed to provision and de-provision service components.

- Properties (see "Custom Service Component Properties" on page 172), which allow you to configure user-defined properties for service components.
- Subscriber options (see "Subscriber Options" on page 210, which allow you to expose service design options in the **Offerings** area of the Cloud Service Management Console and the Marketplace Portal.

To navigate to the sequenced design area

1. In the HP CSA Cloud Service Management Console initial dashboard view, click the **Designs** tile.
2. Click the **Sequenced** tile, which takes you to the **All Designs** area for sequenced designs.

To design a sequenced service

Follow these high-level steps to design a sequenced service:

1. Based on the needs of your organization, create a plan for resource providers, components, lifecycle actions, and other design elements before you begin implementing your design.
2. Make sure the resource providers and resource offerings (with lifecycle actions, as required) that are needed to deploy the service have been set up. See the topic "Resources" in the Resources Help.
3. Create component types, as needed (see the topic "Create a Component Type" in the Components Help), or use out-of-the-box component types (see the topic "Components" in the Components Help).
4. Create the service design (see "Add a Service Design" on page 161).
5. Use the **Designer** (see "Sequenced Designer" on page 166) to create a hierarchy of service components (see "Create a Service Component" on page 169).
6. Add resource bindings, as needed (see "Create a Resource Binding" on page 182).
7. Create lifecycle actions for service components, as needed (see "Create a Lifecycle Action for a Service Component" on page 201).

8. Create custom properties for service components, as needed (see "Create Custom Service Component Properties" on page 174).

9. Create subscriber options for a service design, as needed (see "Subscriber Options" on page 210).

10. Complete the service design (blueprint) and ensure the **Disabled** box is not selected (see "Add a Service Design" on the next page). This makes the service design available for eligible for selection as the basis of a service offering in the **Offerings** area.

View Service Designs

For more information about sequenced designs, see "Sequenced Designs" on page 158.

To view service designs

In the left pane of **All Designs** area, view the list of service design tags. Click a tag to view the list of service designs associated with the selected tag.

Use the following icons and features to navigate and perform tasks in the Designs area:

Item	Description
	Indicates locked items, which cannot be edited or deleted.
	Type search text to filter the results based on a keyword search of display name and description.
	Click to display a tile view of the content.
	Click to display a list view of the content.
Refresh button	Click to refresh the data in this view.
	Click to manage tags.
Create button	Click to add a new item.
Import button	Click to import a service design
	Hover your cursor over this icon to see more information.
	Hover your cursor over this icon to see more information about the error condition.

Design Overview

For more information about sequenced designs, see "Sequenced Designs" on page 158.

To see the design overview

1. In the left pane of the **All Designs** area, select the tag associated with the design whose details you want to view.
2. Select the design whose details you want to view.
3. View design details in the **Overview** tab.
4. For descriptions of the specific properties listed in this view, see the topic "Add a Service Design" below.

In this tab, you can also do the following:

- Click **Export** to export the service design. For more information, see "Import and Export a Service Design" on page 164.
- Click **Clone** to copy the service design. For more information, see "Copy a Service Design" on page 163
- Click **Edit** to edit the name and description of a service design. For more information, see "Edit Service Design Properties" on page 163.
- Click **Delete** to delete the service design. For more information, see "Delete a Service Design" on page 163.

You can also see design information in the following tabs:

- **Designer** tab - for more information see the topic "Sequenced Designer" on page 166.
- **Subscriber Options** tab - for more information see the topic "Subscriber Options" on page 210. This tab is available only for sequenced designs.

Add a Service Design

For more information about sequenced designs, see "Sequenced Designs" on page 158.

To add a service design

1. In right pane of the **All Designs** area, click **Create**.
2. Provide the information in the following table, and click **Create.**
3. When you access the **Designer** tab to begin structuring the service design, click **Create Root Component**. For more information, see "Create a Service Component" on page 169.

Item	Description
Display Name	The name you provide for the service design.
Description	The description you provide for the service design.
URL	A Uniform Resource Locator (URL), which, if configured, provides a link in the **Overview** tab that opens a new browser window to the target location. You can use the URL target location to provide additional information about a service design.
Image	An image that displays for the service design. Click **Change Image**. Choose the image you want, and click **Select**. Click **Upload** to add your own image. Supported file extensions include `.jpg`, `.jpeg`, `.gif`, and `.png`. The recommended image size is 256 by 256 pixels, and the image will be scaled to the appropriate size. The images are stored in the `%CSA_HOME%\jboss-as-7.1.1.Final\standalone\deployments\csa.war\images\library` folder of the HP CSA server.
Additional Settings	**Disabled** - Check the box to indicate that the availability of the service design is **Disabled**. When the box is not checked the availability is **Enabled**. Service Designs configured as **Enabled** appear in the service offering section as blueprints. When **Disabled**, no new service offerings can be created from the service design. If a service design is disabled after service offerings have been created, no new subscriptions can be created from those service offerings.
Tags	**Tags** - Click **Select Tags** to choose from a list of tags that you can define to provide a structure for organizing and grouping the service designs. For more information, see "Manage Tags" on page 224. To remove a tag, hover the cursor over the tag you want to remove, and click the delete ( ) icon.

Edit Service Design Properties

For more information about sequenced designs, see "Sequenced Designs" on page 158.

To edit properties of a service design

1. In the left pane of the **All Designs** area, select the tag associated with the design you want to edit.
2. Select the design you want to edit.
3. In the **Overview** tab, click **Edit**.
4. Edit the properties of the service design, as desired. For descriptions of the specific properties, see the topic "Add a Service Design" on page 161.
5. Click **Save**.

Copy a Service Design

For more information about sequenced designs, see "Sequenced Designs" on page 158.

To copy a service design

1. In the left pane of the **All Designs** area, select the tag associated with the design you want to copy.
2. Select the design you want to copy.
3. In the **Overview** tab, click the **Clone** button.
4. Click **OK**.

The copied service design appears in the **All Designs** area with the word "Copy" appended to the original display name of the service design. After you copy a service design, any changes you make to the original or to the copy will not affect the other.

Delete a Service Design

For more information about sequenced designs, see "Sequenced Designs" on page 158.

A service design cannot be deleted if any service offerings are created from it.

To delete a service design

1. In the left pane of the **All Designs** area, select the tag associated with the design you want to delete.
2. Select the design you want to delete.
3. In the **Overview** tab, click **Delete**.
4. Click **Yes** to confirm the deletion.

Import and Export a Service Design

For more information about sequenced designs, see "Sequenced Designs" on page 158.

For information about importing resource offerings, see the topic "Import and Export a Resource Offering" in the Resources Help.

Prerequisites

Before you import a service design archive, complete the following prerequisites:

1. Import all process definitions that are referenced by the service design, including any referenced by resource offerings that are part of the service design. The process definitions must be imported to the HP CSA installation in which the service design will be imported. During import, process definitions are resolved by **name**. For process definitions that are associated with the HP Operations Orchestration process engine, the **name** corresponds to the full path to the HP Operations Orchestration flow (for example, `/Library/CSA/3.2/Providers/vCenter/vCenter Clone Server/Actions/vCenter Simple Compute - Deploy`). Make sure that these flows have identical signatures and identical paths as the flows on the system from which the service design was exported. For instructions about how to import OO flows, see the section "Import HP Operations Orchestration Flows" in the *HP Cloud Service Automation Configuration Guide*.
2. If the service design you want to import has a dependency on any custom component types, these custom component types must be imported before the service design can be imported.

Importing and Exporting

Import process for service designs

The import process imports archives of service designs and their supported artifacts. Supported artifacts for service designs include associated resource offerings. Service designs with the same internal name are considered to be functionally equivalent and are not imported.

Update process for service designs

During the update process, identical artifacts that exist on the target system are updated (overwritten) with the changes from the archive. Artifacts are created if they do not exist on the target system.

Update preserving original process for service designs

This process imports all the artifacts present in an archive, whether they exist on the target system or not. During this operation, if there is an artifact with the same internal name in the system, the name, the display name, and the description of the artifact are modified internally; the display name and the description are appended with "Superseded on" and the date. The internal name, display name, and description of the artifact being imported remain intact.

Content archive for service designs

Exporting a service design creates a content archive (.zip) file. The content archive contains XML documents for the service design you are exporting, as well as associated artifacts, icons for customizing the artifacts, and the Manifest XML document, which contains meta-information about the archive files.

To import a service design archive

If a service design has active service offerings associated with it, the subscriber options for the service design being imported must match that of the service design on the target system; otherwise, the import of the service offerings does not succeed.

1. In the lower, right pane of the **All Designs** area, click **Import**.
2. Select or specify the **Archive File** (.zip file) that contains the service design you want to import. Archive filenames for service designs begin with `SERVICE_DESIGN_`.
3. Select an **Option**:
   a. **Import** - imports new service designs (and associated resource offerings); does not update existing service designs. Note that you cannot import a service design with the same internal name as an existing service design.

   b. **Update** - imports new service designs (and associated resource offerings) and updates (overwrites) existing service designs. Check **Preserve Originals** to create backup copies

of the original items, appending "Superseded on" and the date to the artifact display names and descriptions.

4. Click **Preview** to see a report of prospective results for the import process, including information about the artifacts and their status.
5. Click **Import**.
6. Click **View Detailed Report** to see a summary and details of the import process, including information about the artifacts and their status.
7. Click **Close**.

To export a service design archive

1. In the left pane of the **All Designs** area, select the tag associated with the design you want to export.
2. Select the design you want to export.
3. In the **Overview** tab, click **Export**.
4. Save the exported service design, if required by your browser.

When you export a service design archive, the service design and all referenced resource offerings are packaged in an archive file whose name is:

```
SERVICE_DESIGN_<service_design_display_name>_<service_design_id>.zip
```

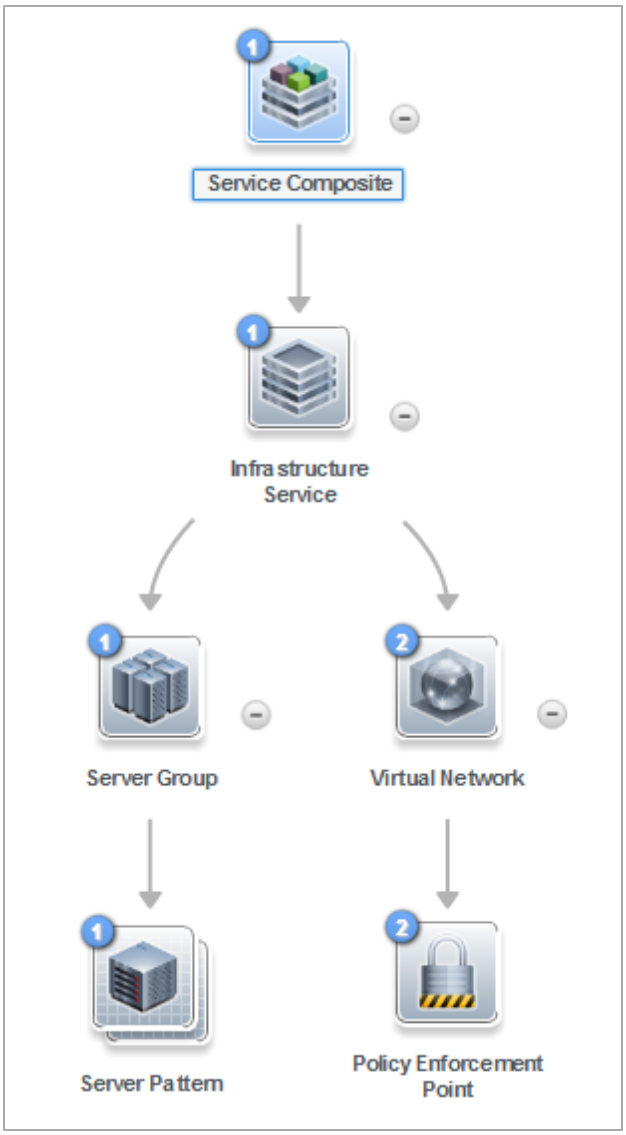
For more information about importing and exporting HP CSA artifacts, see the *HP CSA Content Archive Tool* document.

Sequenced Designer

For more information about sequenced designs, see "Sequenced Designs" on page 158.

The **Designer** allows you to design your sequenced services by creating a hierarchy of service components. A service component is an element of a service design. A service component has a component type that constrains its allowed children and assignable resource offerings. A service design starts with a root service component (Service Composite, in the image below).

An example hierarchy of service components, as shown below, has a Service Composite that contains an Infrastructure Service, which contains a Server Group and a Virtual Network. Also, the Server Group contains a Server (marked as a Pattern), while the Virtual Network contains a Policy Enforcement Point.



To see the component type of a service design element, hover your mouse over the icon for that element. Also, the icon for the element corresponds to the image specified for the component type.

To navigate to the sequenced designer:

1. In the Cloud Service Management Console dashboard, click **Designs**, and then click **Sequenced**.

2. Select a tag or select **All Designs**.

3. In the right pane, select a service design.

4. Click the **Designer** tab.

To use the designer controls

The **Designer** provides the following controls to help you properly display your service design.

Icon	Description
	Zoom the display out or in: • To zoom out, click the left controller box. • To zoom in, click the right controller box. • Move the slider control from left to right to zoom out and in. You can also use your mouse scroll wheel to zoom out and in.
	Click to reload the service design and reset the service components to their default positions.
	Click to automatically fit the service design within the display area.
	Hover over or select a service component to see a toolbar that allows you to create a new child service component or to edit and delete the selected service component.
	Click to collapse the service components in the service design.
	Click to expand the service components in the service design.

Service Components

For more information about sequenced designs, see "Sequenced Designs" on page 158.

A Service Component is an element of a service design. A Service Component has a component type that constrains its allowed children and category of resource offerings (for more information, see the topic "Create a Component Type" in the Components Help.).

See the following related topics:

Create a Service Component

For more information about sequenced designs, see "Sequenced Designs" on page 158.

You can add children to the root service component or to any component that has one or more supported children configured for it.

To create a service component

1. In the left pane of the **All Designs** area, select the tag associated with the design to which you want to add a child service component.
2. Select the service design.
3. In the **Designer** tab, select the service component to which you want to add a child.
4. Click the **Create New Child Service Component** ( ) icon.
5. Provide the following information:

Item	Description
Component Palette	Select the component palette that contains the component type you want to select for this service component, and then click **Next**. The list of component palettes displays only those palettes that are applicable to the service component for which you are creating a child. A component palette contains a group of component types from which you can choose when creating service components in a service design. To create additional palettes, see .the topic "Create a Component Palette" in the Components Help.

Item	Description
Component Type	Select a component type for the service component you are creating, and then click **Next**. The list of component types displays only those types that are applicable to the service component for which you are creating a child. Component type properties provide a base set of attributes for the service component. For more information, see the topic "Components" in the Components Help.
Component Template	Select a component template for the service component you are creating, and then click **Next**. A component template is a specialized version of a component type and is used to simplify service design creation. Component templates include customized settings for the properties and lifecycle actions that provide initial settings for the service design. When a template is added to a design, any default properties and lifecycle actions are automatically populated in that service component within the design. This list always includes a **Default Template**, which uses the settings as configured for the selected component type. For more information, see the topic "View Component Templates" in the Components Help.
Identification Details:	
Display Name	The name you provide for the service component.
Description	The description you provide for the service component.
Component Order	Select a number to specify the deployment processing order for this service component relative to its sibling service components (that is, service components who share the same parent). Service components are processed in ascending order during service deployment and in descending order during undeployment.

Item	Description
Marketplace Portal Options	Select **Visible** to specify that this service component is visible in the Marketplace Portal. De-select it to specify that the service component will not be visible. Custom service component properties and lifecycle actions that have been configured to be visible in the Marketplace Portal will only be displayed in the Marketplace Portal if the associated service component is itself configured to be visible. The visibility of a service component does not affect visibility of its child service components, and it is not necessary for a parent of a service component to be visible for the child component to be visible in the Marketplace Portal.
Pattern	Select this box to mark the service component as a pattern. This indicates that the service component will not be automatically processed by the CSA lifecycle engine. When you create a pattern service component, you must also create a Clone Pattern action in the parent service component. For example, the out-of-the-box component type, Server, is typically marked as a pattern, and its parent service component, Server Group, includes the Clone Pattern action. At subscription time, the Clone Pattern action creates one or more service component instances from this service component pattern. The root service component in a service design cannot be marked as a pattern. You can identify a service component that is marked as a pattern because its icon appears as a stacked, double image with a grid-like background, as shown below. 

Delete a Service Component

For more information about sequenced designs, see "Sequenced Designs" on page 158.

When you delete a service component, all of its child service components are also deleted.

To delete a service component

1. Select the service component you want to delete.
2. Click the **Delete** (✕) icon.
3. Click **Yes** to confirm the deletion.

Edit Properties of a Service Component

For more information about sequenced designs, see "Sequenced Designs" on page 158.

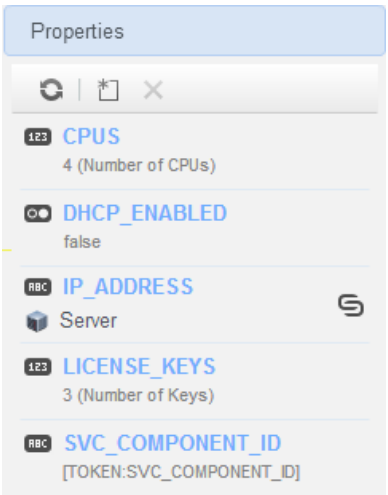
To edit properties of a service component

1. Select the service component whose properties you want to edit.
2. Click the **Edit** ( ) icon, or double click the service component display name or icon.
3. Edit the properties of the service design, as desired.
4. For descriptions of the specific properties, see the topic "Create a Service Component" on page 169.

Custom Service Component Properties

For more information about service components, see "Service Components" on page 168.

Custom service component properties are managed using the **Properties** pane (shown below) in the **Designer** tab.



Custom properties for service components are user-defined properties that you may want to create in the following situations:

- When a service component receives its value from a subscriber option. For example, you may want to get the number of CPUs for a server after its value has been specified in the

Marketplace Portal. To do this, create a custom property (for example, `NCPU`) on the Server service component, and create a subscriber option property (for example, `NCPU`). Finally, use a target binding, as described in "Subscriber Options" on page 210, to push the value from the subscriber option to the Server `NCPU` property.

- When an action that runs on a service component or its associated resource offering expects a property value with a given name/value to exist on the service component. For example, an action may need to retrieve an ipAddress that is stored a Server service component.
- When a service design needs to receive the value of a property that is stored on another service component. For example, a Software Application Tier service component may need to know the service component ID of a Server Group. You can create a property on the Server Group service component called `SVC_COMPONENT_ID`, which has a token value of `[TOKEN:SVC_COMPONENT_ID]`. You would also create a property on the Software Application Tier service component whose value contains a source binding to the Server Group property (`SVC_COMPONENT_ID`). The property value is then pulled by the Software Application Tier from that `SVC_COMPONENT_ID` property on the Server Group. This use of custom service component properties to pull a value from another service component property is called a *source binding*. Another type of value binding is called *target binding*. For more information about target bindings, see "Subscriber Options" on page 210.
- When you want to expose a property value in the Marketplace Portal. The property value can be explicitly defined on the service component, or may be set as the result of an action execution (for example, a HOSTNAME property might be set on a Server service component as part of deploying the Server).

See the following related topics:

- "View Custom Service Component Properties" below
- "Create Custom Service Component Properties" on the facing page
- "Delete Custom Service Component Properties" on page 180
- "Edit Custom Service Component Properties" on page 181

View Custom Service Component Properties

For more information about custom service components, see "Custom Service Component Properties" on the previous page.

To view custom properties of a service component

1. In the left pane of the **All Designs** area, select the tag associated with the design that contains the service component.
2. Select the service design.
3. In the **Designer** tab, select the service component whose custom properties you want to view.
4. In the right pane, select **Properties**.
5. The **Properties** pane displays the custom properties of the selected component.

Create Custom Service Component Properties

For more information about custom service components, see "Custom Service Component Properties" on page 172.

To create custom service component properties

1. In the left pane of the **All Designs** area, select the tag associated with the design that contains the service component.
2. Select the service design.
3. In the **Designer** tab, select the service component to which you want to add a custom property.
4. In the right pane, select **Properties**.
5. In the **Properties** pane tool bar, click the **Create** ( ) icon.
6. Provide the following information:

Item	Description
Property Type	Select one of the following: • **Boolean** - A property whose value is true or false. • **List** - A property whose value is a list of String values. • **Integer** - A property whose value is a positive or negative whole number (or zero). • **String** - A property whose value is a sequence of characters.

Item	Description
Property Details	***For Boolean properties:*** • **Name** - A unique name for the property. • **Display Name** - The display name for the property. • **Description** - A description of the property. • **Marketplace Portal Options**: ▪ **Visible** - Indicates that this property will be made visible in the Marketplace Portal. • **Value Entry Method** ▪ **Manual Entry**- Select a **Value**, either **true** or **false**. ▪ **Source Binding**- Indicates the value for this property will be provided by a property in another service component. ○ To set the source binding, click the **Select Service Component** ( ) icon. ○ Then, select the service component that contains the property from which you want to retrieve the value. From the list of compatible properties, select the property from which you want to retrieve the value. This selection creates a source binding that pulls the value from the selected service component property into the one whose property you are creating. This type of property is called a source binding. For more information about source bindings, see "Custom Service Component Properties" on page 172. ***For List properties:*** • **Name** - A unique name for the property. • **Display Name** - The display name for the property. • **Description** - A description of the property. • **Marketplace Portal Options**: ▪ **Visible** - Indicates that this property will be made visible in the Marketplace Portal.

Item	Description
	• **Value Entry Method** ▪ **Manual Entry**- Click the **Add Value** (+) icon to add a new value, or click the **Remove Selected Value(s)** icon (—) to remove a selected value. ▪ **Source Binding**- Indicates the value for this property will be provided by a property in another service component. ○ To set the source binding, click the **Select Service Component** ( ) icon. ○ Then, select the service component that contains the property from which you want to retrieve the value. From the list of compatible properties, select the property from which you want to retrieve the value. This selection creates a source binding that pulls the value from the selected service component property into the one whose property you are creating. This type of property is called a source binding. For more information about source bindings, see "Custom Service Component Properties" on page 172. ***For Integer properties***: • **Name** - A unique name for the property. • **Display Name** - The display name for the property. • **Description** - A description of the property. • **Marketplace Portal Options**: ▪ **Visible** - Indicates that this property will be made visible in the Marketplace Portal. • **Resource Type and Unit for a Measurable Property** - Select the resource type and unit, which are used to influence provider and pool selection and resource accounting. You must set this to a value other than **None** to make this property measurable and available for configuration on a resource binding. You can also specify the resource type and unit simply to clarify the intent of the property. Note that when creating a **Source Binding** for a service component, a best practice is that both the service component property you are creating and the service component property you are binding to will have the same **Resource Type and Unit for Measurable Property**

Item	Description

	value.
	
	• **Value Entry Method**
	  ▪ **Manual Entry**- Select or type a **Value**, which can be a positive or negative whole number or zero. If you enter a decimal number, the value will be truncated to the nearest integer.
	
	  ▪ **Source Binding**- Indicates the value for this property will be provided by a property in another service component.
	  ○ To set the source binding, click the **Select Service Component** ( ) icon.
	
	  ○ Then, select the service component that contains the property from which you want to retrieve the value. From the list of compatible properties, select the property from which you want to retrieve the value. This selection creates a source binding that pulls the value from the selected service component property into the one whose property you are creating. This type of property is called a source binding. For more information about source bindings, see "Custom Service Component Properties" on page 172.
	
	For String properties:
	
	• **Name** - A unique name for the property.
	
	• **Display Name** - The display name for the property.
	
	• **Description** - A description of the property.
	
	• **Marketplace Portal Options**:
	  ▪ **Visible** - Indicates that this property will be made visible in the Marketplace Portal.
	
	• **Value Entry Method**
	  ▪ **Manual Entry**- Select a **Value** by clicking the **Token Selection** icon.
	  ○ **Confidential data** - Select this box to mask the values so that they cannot be read in the user interface; no encryption of the value is performed.
	
	  ▪ **Source Binding**- Indicates the value for this property will be provided by a

Item	Description
	property in another service component. ○ To set the source binding, click the **Select Service Component** ( ) icon. ○ Then, select the service component that contains the property from which you want to retrieve the value. From the list of compatible properties, select the property from which you want to retrieve the value. This selection creates a source binding that pulls the value from the selected service component property into the one whose property you are creating. This type of property is called a source binding. For more information about source bindings, see "Custom Service Component Properties" on page 172.

The following tokens are available for custom service component properties:

Token	Description
Parent Service Component ID ([TOKEN:PRN_COMPONENT_ID])	Resolves to the Service Component ID of the parent service component.
Service Blueprint ID ([TOKEN:SVC_BLUEPRINT_ID])	Resolves to the Service Blueprint ID.
Service Catalog ID ([TOKEN:SVC_CATALOG_ID])	Resolves to the Service Catalog ID used at subscription time.
Service Component ID ([TOKEN:SVC_COMPONENT_ID])	Resolves to the Service Component ID of the component associated with this action.
Service Component Type ([TOKEN:SVC_COMPONENT_TYPE])	Resolves to the Service Component Type (for example, Server) of the component associated with this action.
Service Instance ID ([TOKEN:SVC_INSTANCE_ID])	Resolves to the Service Instance ID created at subscription time.
Service Offering ID ([TOKEN:SVC_OFFERING_ID])	Resolves to the Service Offering ID.

Token	Description
Service Request Organization ID ([TOKEN:REQ_ORG_ID])	Resolves to the Organization ID associated with the service request.
Service Request User ID ([TOKEN:REQ_USER_ID])	Resolves the User ID associated with the service request.
Subscriber's Email Address ([TOKEN:SVC_SUBSCRIPTION_EMAIL])	Resolves to email address of the subscriber.
Subscriber's Organization ID ([TOKEN:USR_ORG_ID])	Resolves to the Organization ID associated with the subscriber.
Subscription ID ([TOKEN:SVC_SUBSCRIPTION_ID])	Resolves to the Subscription ID created at subscription time.

Delete Custom Service Component Properties

For more information about custom service components, see "Custom Service Component Properties" on page 172.

A custom service component property cannot be deleted if other properties are bound to it. For more information about source bindings, see "Custom Service Component Properties" on page 172. For more information about target bindings, see "Subscriber Options" on page 210.

To delete custom properties from a service component

1. In the left pane of the **All Designs** area, select the tag associated with the design that contains the service component.
2. Select the service design.
3. In the **Designer** tab, select the service component from which you want to delete a custom property.
4. In the right pane, select **Properties**.
5. In the **Properties** pane select the custom properties you want to delete.

6. Click the **Delete** (✕) icon.
7. Click **Yes** to confirm the deletion.

Edit Custom Service Component Properties

For more information about custom service components, see "Custom Service Component Properties" on page 172.

To edit custom properties of a service component

1. In the left pane of the **All Designs** area, select the tag associated with the design that contains the service component.
2. Select the service design.
3. In the **Designer** tab, select the service component whose custom properties you want to edit.
4. In the right pane, select **Properties**.
5. Click the name of the custom property you want to edit.
6. For descriptions of the specific properties, see the topic "Create Custom Service Component Properties" on page 174.

Resource Bindings

- For more information about sequenced designs, see "Sequenced Designer" on page 166.
- For more information about resource offerings, see the topic "Resource Offerings" in the Resources Help.

A resource binding is a link in a service design between a resource offering and a service component. For example, a resource offering for a VMware vCenter VM template can be linked to a Server service component. The resource binding ensures that the resource offering will be provisioned when the Server service component is deployed.

You can also create resource bindings on component templates. For more information, see .the topic "View Component Template Resource Bindings" in the Components Help.

See the following related topics:

Create a Resource Binding

For more information about resource bindings, see "Resource Bindings" on the previous page.

This topic describes how to create a resource binding in the following ways:

- On a component template.
- On a service component.

To create a resource binding on a component template

1. In the left pane of the **Components** area, select the component palette that contains the component type whose template resource binding you want to create.
2. Click the component type whose template resource binding you want to create.
3. Select the **Templates** tab.
4. In the component templates list, click the component template whose resource binding you want to create.
5. At the bottom of the **Resource Bindings** tab, click **Create**.
6. In the **Create New Resource Binding** wizard, provide the information described in the table below.

To create a resource binding on a service component

1. In the left pane of the **All Designs** area, select the tag associated with the design that contains the service component.
2. Select the service design.
3. In the **Designer** tab, select the service component to which you want to add a resource binding.
4. In the right pane, select **Resource Bindings**.
5. In the toolbar, click the **Create** ( ) icon.
6. In the **Create New Resource Binding** wizard, provide the following information:

Item	Description
Resource Category	Select the category of the resource offering you want to bind to the service component. For more information, see the topic "Components" in the Components Help) and the topic "View Constraints of a Component Type" in the Components Help.
Resource Offering	Select the resource offering you want to bind to the service component. You cannot edit this selection after a resource binding has been created. For more information about Resource Offerings, see the topic "Resource Offerings" in the Resources Help.
Provider Type	You see this field when you view the properties of a resource binding. The provider type is determined by the selected resource offering; you cannot edit the provider type.
Binding Order	When a resource binding is created, it is automatically assigned a binding order number. The binding order specifies the order in which the associated resource offering will be provisioned relative to other resource bindings configured for the service component. Resource bindings are processed in ascending order during service deployment and in descending order during undeployment. The number automatically assigned is the next available number, starting with 1, 2, 3, etc. After a resource binding has been created, you can edit it to reset the binding order by selecting a number from 1 to 99. You are allowed to create duplicate binding orders, which will be processed in an indeterminate order.

Delete a Resource Binding

For more information about resource bindings, see "Resource Bindings" on page 181.

To delete a resource binding

1. In the left pane of the **All Designs** area, select the tag associated with the design you want to modify.
2. Select the service design.
3. In the **Designer** tab, select the service component whose resource binding you want to delete.
4. In the right pane, select **Resource Bindings**.
5. Highlight the resource binding you want to delete.
6. In the toolbar, click the **Delete** (✕) icon.
7. Click **Yes** to confirm the deletion.

View Properties of a Resource Binding

For more information about resource bindings, see "Resource Bindings" on page 181.

To view the properties of a resource binding

1. In the left pane of the **All Designs** area, select the tag associated with the design you want to view.
2. Select the service design.
3. In the **Designer** tab, select the service component whose resource binding you want to view.
4. In the right pane, select **Resource Bindings**.
5. Click the name of the resource binding you want to view.

Select one of the following tabs for more information:

- **Summary** tab - View the properties of the resource binding. For descriptions of the specific properties, see the topic "Create a Resource Binding" on page 182.

- **Provider Selection** tab - View and create resource provider selection actions, which execute as part of the Pre-Transition substate of the Reserving lifecycle state. For more information, see "Create Provider Selection Actions for Resource Bindings" on page 188.
- **Resource Accounting** tab - View and create accounting actions that execute during the Reserving and Un-reserving states when the resource binding is provisioned. For more information, see "Create Resource Accounting Actions" on page 193.
- **Measurable Properties** tab - View and create measurable properties on a resource binding. For more information, see "View Measurable Properties" on page 195.
- **Offering Lifecycle** tab - See a read-only view of the lifecycle actions associated with the resource offering used for this resource binding. For more information about Resource Offerings, see the topic "Resource Offerings" in the Resources Help.
- **Offering Properties** tab - View a read-only list of properties for the resource offering used for this resource binding. For more information about Resource Offerings, see the topic "Resource Offerings" in the Resources Help.

Edit Properties of a Resource Binding

For more information about resource bindings, see "Resource Bindings" on page 181.

This topic describes how to edit properties of a resource binding in the following ways:

- On a component template.
- On a service component.

To edit properties of a resource binding on a component template

1. In the left pane of the **Components** area, select the component palette that contains the component type whose template resource binding you want to edit.
2. Click the component type whose template resource binding properties you want to edit.
3. Select the **Templates** tab.
4. In the component templates list, click the component template whose resource binding properties you want to edit.

5. Click the **Resource Bindings** tab.
6. Select the display name of the resource binding you want to edit.
7. In the Summary tab, click the **Edit** ( ) icon.
8. Edit the properties of the resource binding, as desired. For descriptions of the specific properties, see the topic "Create a Resource Binding" on page 182.

To edit properties of a resource binding on a service component

1. In the left pane of the **All Designs** area, select the tag associated with the design you want to modify.
2. Select the service design.
3. In the **Designer** tab, select the service component whose resource binding you want to edit.
4. In the right pane, select **Resource Bindings**.
5. Click the name of the resource binding you want to edit.
6. In the **Summary** tab, click the **Edit** ( ) icon.
7. Edit the properties of the resource binding, as desired. For descriptions of the specific properties, see the topic "Create a Resource Binding" on page 182.

You can also see read-only information regarding resource bindings by clicking the **Lifecycle** and **Properties** tabs.

View Properties of a Provider Selection Action for Resource Bindings

For more information about resource bindings, see "Resource Bindings" on page 181.

To view properties of a provider selection action for resource bindings

1. In the left pane of the **All Designs** area, select the tag associated with the design you want to view.
2. Select the service design.

3. In the **Designer** tab, select the service component whose provider selection action properties you want to view.
4. In the right pane, select **Resource Bindings**.
5. Click the name of the resource binding.
6. Select the **Provider Selection** tab.
7. Click the name of the action whose properties you want to view.
8. For descriptions of the specific properties in the **Summary** tab, see the topic "Create Provider Selection Actions for Resource Bindings" on the facing page.
9. Select the **Properties** tab to view the action inputs that will be passed to the process definition. For more information about the specific properties, see the topic "Edit Properties of a Lifecycle Action for a Service Component" on page 207. Note that provider selection actions for resource bindings always execute during the Pre-Reserving lifecycle state.

Edit Properties of a Provider Selection Action for Resource Bindings

For more information about resource bindings, see "Resource Bindings" on page 181.

To edit properties of a provider selection action for resource bindings

1. In the left pane of the **All Designs** area, select the tag associated with the design you want to modify.
2. Select the service design.
3. In the **Designer** tab, select the service component whose provider selection action properties you want to edit.
4. In the right pane, select **Resource Bindings**.
5. Click the name of the resource binding.
6. Select the **Provider Selection** tab.
7. Click the name of the action whose properties you want to edit.

8. For descriptions of the specific properties in the **Summary** tab, see the topic "Create Provider Selection Actions for Resource Bindings" below.

9. Select the **Properties** tab to edit the action inputs that will be passed to the process definition.

Create Provider Selection Actions for Resource Bindings

For more information about resource bindings, see "Resource Bindings" on page 181.

You must create one or more provider selection actions for a resource binding. The provider selection actions execute during the Pre-Transition substate of the Reserving lifecycle state; the lifecycle state cannot be changed.

HP CSA ships with internal actions to help with provider selection.

- If you have ***not*** configured resource pools on a provider, then the two provider selection actions most likely to be configured on a resource binding are the **Build Resource Provider List** action and the **Select Resource Provider** action, which should run in that order. To select the provider already selected by the parent service component, use the **Select Resource Provider from Parent** action instead of the two previously mentioned actions.

- If you have configured resource pools on a provider, then the two provider selection actions most likely to be configured on a resource binding are the **Build Resource Provider and Pool List** action and the **Select Resource Provider and Pool** action, which should run in that order. To select the provider and pool already selected by the parent service component, use the **Select Resource Provider and Pool from Parent** action instead of the two previously mentioned actions.

For information about creating resource accounting actions for resource bindings, see "Create Resource Accounting Actions" on page 193.

See the following table for descriptions of the out-of-the-box internal actions that ship with HP CSA:

Internal Action	Description	Applies To
Build Resource Provider and Pool List	Builds a candidate list of resource providers and associated resource pools that meet the following requirements: • Support the resource offering referenced in a resource binding. • Have an **Availability** of **Enabled**. • If the service offering that references the service design with this action is in a service catalog with resource environments selected, the candidate list is further restricted to only include resource providers in one or more of the selected resource environments. • The provider's resource pool has sufficient resource capacity. To determine this, you must consider all measurable properties as configured in the **Measurable Properties** tab for the resource bindings, as well as the optional **Multiplier Property Name** field. The resource pool must have enough resource capacity to support all the properties, which requires that each necessary resource type (for example: CPU, Memory, and Storage), based on the measurable properties, be configured on the pool either with a **Resource Availability** of **Unlimited** or **Available**. If **Available**, the difference between **Total Available To CSA** and **Current CSA Utilization** must be sufficient to support the measurable property requirements.	• Resource Binding
Build Resource Provider List	Builds a candidate list of resource providers that meet the following requirements: • Support the resource offering referenced in a resource binding. • Have an **Availability** of **Enabled**. • If the service offering that references the service design with this action is in a service catalog with resource environments selected, the candidate list is further restricted to only include resource providers in one or more of the selected resource environments.	• Resource Binding

Internal Action	Description	Applies To
Clone Pattern	Clones a service component that is marked as a **Pattern** into one or more non-pattern service components. The number of service components created is determined by the value of the property specified in **Name of the Property for Service Component Count**.	• Service Component
Decrease Resource Utilization	Decreases the utilization of one or more resources in a resource pool by the values of the measurable properties configured on a resource binding. This action should be configured in the **Un-reserve** section of the **Resource Accounting** tab on a resource binding.	• Resource Binding
Increase Resource Utilization	Increases the utilization of one or more resources in a resource pool by the values of the measurable properties configured on a resource binding. This action should be configured in the **Reserve** section of the **Resource Accounting** tab on a resource binding.	• Resource Binding
Log Messages	Writes the user-specified Boolean Input, Integer Input, and String Input property values to the `csa.log` file. You can include this as an action on a Service Component, Resource Binding, or Resource Offering for use in troubleshooting.	• Resource Binding • Resource Offering • Service Component
Select Resource Pool from Provider	This internal action is deprecated and may be removed in a future HP CSA release. Use the **Select Resource Provider and Pool** action in conjunction with the **Build Resource Provider and Pool List** action in place of this action. Selects a resource pool from the set of resource pools associated with the selected resource provider. A resource pool must have an **Availability** of **Enabled** to be selected. The selected resource pool will be available to resource offering actions in the token `RSC_POOL_ID`.	• Resource Binding

Internal Action	Description	Applies To
Select Resource Provider	Selects a resource provider from the candidate list that was built by the **Build Resource Provider List** action. The selected resource provider will be available to resource offering actions in the token `RSC_PROVIDER_ID`. The selected provider will, optionally, be written to a property on the associated service component if the `Provider Property Name` input to the action is provided.	• Resource Binding
Select Resource Provider and Pool	Selects a resource pool and provider from the candidate list that was built by the **Build Resource Provider and Pool List** action. The selected resource provider and pool will be available to resource offering actions in the token `RSC_PROVIDER_ID` and `RSC_POOL_ID`, respectively. The selected pool will, optionally, be written to a property on the associated service component if the `Pool Property Name` input to the action is provided.	• Resource Binding
Select Resource Provider and Pool from Parent	Selects the resource pool and provider already chosen by a service component's parent service component, as identified by the `Parent Component ID` and `Pool Property Name` properties. The selected resource provider and pool will be available to resource offering actions in the token `RSC_PROVIDER_ID` and `RSC_POOL_ID` respectively. The selected pool will also be written to a `Pool Property Name` property on the associated service component.	• Resource Binding
Select Resource Provider from Parent	Selects the resource provider already chosen by a service component's parent service component, as identified by the `Parent Component ID` and `Provider Property Name` properties. The selected resource provider will be available to resource offering actions in the token `RSC_PROVIDER_ID`. The selected resource provider will also be written to a `Provider Property Name` property on the associated service component.	• Resource Binding

To create a provider selection action for resource bindings

1. In the left pane of the **All Designs** area, select the tag associated with the design you want to modify.

2. Select the service design.

3. In the **Designer** tab, select the service component to which you want to add a provider selection action.
4. In the right pane, select **Resource Bindings**.
5. Click the name of the resource binding.
6. Select the **Provider Selection** tab.
7. Select the **Create** icon ( ).
8. Provide the following information:

Item	Description
Process Engine	Select a process engine, which is a container for process definitions. You can select either the CSA Internal process engine or an HP Operations Orchestration (OO) engine.
Process Definition	Select a process definition, which is configured to run a specified internal action (see the table above for the list of internal actions) or external action.
Display Name	The name you provide for the lifecycle action.
Description	The description you provide for the lifecycle action.
Execution Order	The execution order for the lifecycle action, which is relative to other provider selection actions on this resource binding, if applicable. Lifecycle actions are executed in ascending order.
Execution Properties	Specify the following: • Fail on Error - If selected, this indicates that provisioning or de-provisioning will stop if the lifecycle action fails. • Error on Timeout - If selected, this indicates that provisioning or de-provisioning will stop if the lifecycle action times out.
Timeout (seconds)	The time to wait until a timeout occurs for the lifecycle action. Set this field to zero (0) if you do not want the action to timeout.

View Resource Accounting Actions

For more information about resource bindings, see "Resource Bindings" on page 181.

Resource accounting actions track the utilization of resources in a resource pool. You see two lists of accounting actions in the **Resource Accounting** tab:

- **Reserve** - actions that record the usage of resources during provisioning.
- **Un-reserve** - actions that record the release of resources during de-provisioning.

To view resource accounting

1. In the left pane of the **All Designs** area, select the tag associated with the design you want to view.
2. Select the service design.
3. In the **Designer** tab, select the service component whose resource accounting action properties you want to view.
4. In the right pane, select **Resource Bindings**.
5. Click the name of the resource binding.
6. Select the **Resource Accounting** tab.

For more information about the fields in this tab, see "Create Resource Accounting Actions" below

Create Resource Accounting Actions

For more information about resource bindings, see "Resource Bindings" on page 181.

If you want to enable resource accounting, you must create one or more resource accounting actions for a resource binding. The following out-of-the-box accounting actions are provided by HP CSA:

- **Increase Resource Utilization** - Configure this action in the **Reserve** section of the **Resource Accounting** tab so that it runs during the Reserving lifecycle state.

- **Decrease Resource Utilization** - Configure this action in the **Un-reserve** section of the **Resource Accounting** tab so that it runs during the Un-reserving lifecycle state.

You can also create your own resource accounting actions and configure them in the **Resource Accounting** tab. As a best practice, do not create resource accounting actions on group-level service components. For example, do not create a resource accounting action on a Server Group; instead, create it on a Server service component.

To create a resource accounting action for resource bindings

1. In the left pane of the **All Designs** area, select the tag associated with the design you want to modify.
2. Select the service design
3. In the **Designer** tab, select the service component to which you want to add a resource accounting action.
4. In the right pane, select **Resource Bindings**.
5. Click the name of the resource binding.
6. Select the **Resource Accounting** tab.
7. Determine if you want to add an action to the **Reserve** or **Un-reserve** section of the tab.
8. In the desired section, select the **Create** icon ( ).
9. Provide the information as described in "Create Provider Selection Actions for Resource Bindings" on page 188, being sure to specify the following if you want to use the out-of-the-box resource accounting actions:

- **Process Engine** - Select the **CSA Internal** process engine.
- **Process Definition** - Select one of the following out-of-the-box process definitions, depending on whether you want to record the usage or release of the resource:
  - **Increase Resource Utilization**
  - **Decrease Resource Utilization**

You can also create and select your own custom actions for resource accounting.

View Measurable Properties

For more information about resource bindings, see "Resource Bindings" on page 181.

A measurable property is an integer service component property that has a configured **Resource Type** and **Unit** (see "Create Custom Service Component Properties" on page 174). When you configure measurable properties on a resource binding, you create references to the corresponding service component measurable properties. To view the value of a measurable property, see the corresponding service component property in the **Designer** tab.

Measurable properties are used by the following out-of-the-box actions to assist in provider and pool selection and in resource accounting:

- **Build Resource Provider and Pool List**
- **Increase Resource Utilization**
- **Decrease Resource Utilization**

If you configure any of these actions on a resource binding in the **Provider Selection** or **Resource Accounting** tabs, you must also configure the measurable properties for the binding in the **Measurable Properties** tab.

To view measurable properties on a resource binding

1. In the left pane of the **All Designs** area, select the tag associated with the design you want to view.
2. Select the service design.
3. In the **Designer** tab, select the service component that contains the resource binding whose measurable properties you want to view.
4. In the right pane, select **Resource Bindings**.
5. Click the name of the resource binding whose measurable properties you want to view.
6. Select the **Measurable Properties** tab.

For more information about the fields in this tab, see "Add and Remove Measurable Properties" on the facing page.

Add and Remove Measurable Properties

For more information about resource bindings, see "Resource Bindings" on page 181.

To add measurable properties to resource bindings

1. In the left pane of the **All Designs** area, select the tag associated with the design you want to modify.
2. Select the service design.
3. In the **Designer** tab, select the service component that contains the resource binding to which you want to add measurable properties.
4. In the right pane, select **Resource Bindings**.
5. Click the name of the resource binding to which you want to add measurable properties.
6. Select the **Measurable Properties** tab.
7. Click the **Add** (+) icon.
8. Select the measurable properties you want to add.
9. Click **Add**.

To remove measurable properties from resource bindings

1. In the left pane of the **All** Designs area, select the tag associated with the design you want to modify.
2. Select the service design.
3. In the **Designer** tab, select the service component that contains the resource binding from which you want to remove measurable properties.
4. Click the name of the resource binding from which you want to remove measurable properties.
5. Select the **Measurable Properties** tab.
6. Select the measurable properties you want to remove.

7. Click the **Remove** (—) icon.

8. Click **Yes** to confirm the deletion.

Lifecycle Actions for Service Components

For more information about service components, see "Service Components" on page 168.

What is a service component lifecycle?

The **Lifecycle** window allows you to specify the lifecycle actions that are needed to provision and de-provision service components. A lifecycle action provides a link from a service component to an internal or external process definition, which runs to perform a specified action. The collection of actions defined for a service component is known as its lifecycle. In the following diagram you can see the service component lifecycle states, which are discussed in more detail below.

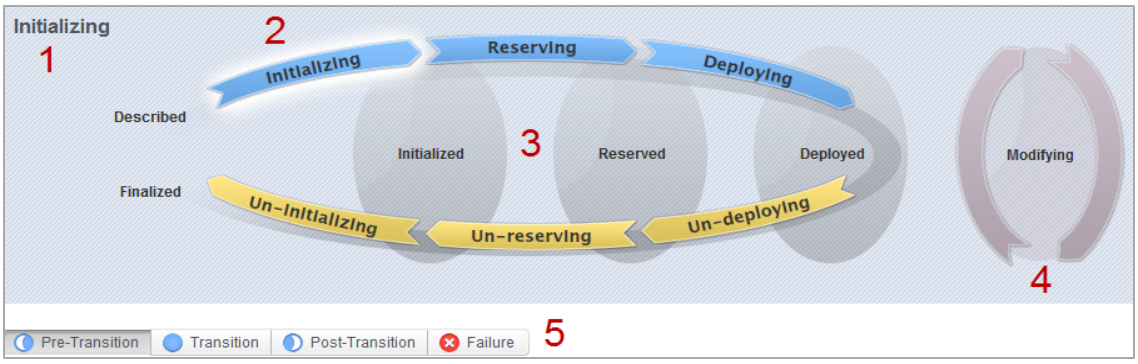


Image legend:

- 1 - Currently selected state
- 2 - Transition states
- 3 - Stable states
- 4 - Modifying state
- 5 - Substates

What is a lifecycle action?

A lifecycle action is a function that is either run automatically at a specified lifecycle state or substate, or that is exposed to the subscriber. Lifecycle actions contain the following information:

- A reference to a process definition, which contains the logic for executing the function.
- The property values that are inputs to the process definition.

What are lifecycle states?

A lifecycle state represents a step within the CSA service provisioning and de-provisioning lifecycles. States are either transition states or stable states.

- The following *transition states* are represented in the diagram as curved, arrow icons:
  - Initializing
  - Reserving
  - Deploying
  - Un-deploying
  - Un-reserving
  - Un-initializing
- The following *stable states* (except for Described and Finalized) are represented in the diagram as shaded, oval icons:
  - Described - lifecycle actions cannot be specified at this state
  - Initialized
  - Reserved
  - Deployed
  - Finalized - lifecycle actions cannot be specified at this state

What is a modifying state?

The modifying state is a special transition state that indicates a subscriber has chosen to modify a subscription, and the changes are being processed by the lifecycle engine. The modifying state is shown in the diagram to the right of the other lifecycle states.

The only service components that are processed during the modifying state are those service components that have a Subscriber Option property that gets its value directly from a target binding, or those service components that have a source binding that gets its value indirectly from such a target binding.

The only resource offerings that are processed during the modifying state are those associated with service components that are processed during the modifying state.

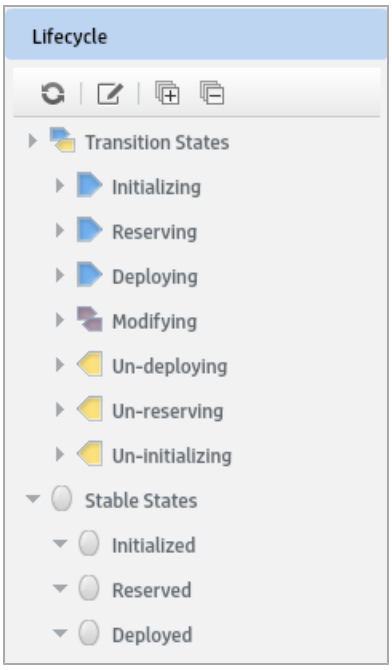
What are lifecycle substates?

A lifecycle substate is a further refinement of a lifecycle transition state. Stable states do not have substates. When defining a lifecycle action at a transition state, you must also specify the substate for the action. Substates are represented in the diagram as tabs just beneath the lifecycle diagram. The *substates* are:

- Pre-Transition
- Transition
- Post-Transition
- Failure

To see the list of all lifecycle actions for a service component:

1. In the left navigation pane, select **Service Designs**.
2. In the **Service Designs** tab select the **Display Name** of the service design for which you want to see a list of lifecycle actions.
3. In the **Designer** tab, select the service component whose lifecycle actions you want to see.
4. In the right pane (shown below), select **Lifecycle**.
5. In the **Lifecycle** pane tool bar, click the **Expand All** ( ) icon. In the list, you can see all lifecycle actions configured for each state and substate.



See the following related topics:

- "View Properties of a Lifecycle Action for a Service Component" below
- "Create a Lifecycle Action for a Service Component" on the next page
- "Delete a Lifecycle Action from a Service Component" on page 206
- "Edit Properties of a Lifecycle Action for a Service Component" on page 207
- "Move a Lifecycle Action for a Service Component" on page 209

View Properties of a Lifecycle Action for a Service Component

For more information about lifecycles, see "Lifecycle Actions for Service Components" on page 197.

To view the properties of a lifecycle action for a service component

1. In the left pane of the **All Designs** area, select the tag associated with the design you want to view.
2. Select the service design.

3. In the **Designer** tab, select the service component for which you want to view the properties of a lifecycle action.

4. In the right pane, select **Lifecycle**.

5. In the **Lifecycle** pane toolbar, select the **Modify Lifecycle Actions** ( ) icon.

6. In the **Lifecycle** window, on the lifecycle state diagram, select the lifecycle state for which you want to view the properties of an action. For more information about states and substates, see "Lifecycle Actions for Service Components" on page 197.

7. Select the lifecycle substate (located directly beneath the lifecycle state diagram), if applicable.

8. From the list of actions, select the **Display Name** of the action whose properties you want to view.

9. For descriptions of the properties in the **Summary** tab, see the topic "Create a Lifecycle Action for a Service Component" below. For descriptions of the properties in the **Properties** tab, see the topic "Edit Properties of a Lifecycle Action for a Service Component" on page 207.

Create a Lifecycle Action for a Service Component

For more information about lifecycles, see "Lifecycle Actions for Service Components" on page 197.

Before you create lifecycle actions, be sure you have the latest process definitions from HP Operations Orchestration. For instructions about how to do this, see the section "Import HP Operations Orchestration Flows" in the *HP Cloud Service Automation Configuration Guide*.

To create a lifecycle action for a service component

1. In the left pane of the **All Designs** area, select the tag associated with the design you want to modify.

2. Select the service design.

3. In the **Designer** tab, select the service component for which you want to create a lifecycle action.

4. In the right pane, select **Lifecycle**.

5. In the **Lifecycle** pane toolbar, select the **Modify Lifecycle Actions** ( ) icon.
6. In the **Lifecycle** window, on the lifecycle state diagram, select the lifecycle state for which you want to create an action. For more information about states and substates, see "Lifecycle Actions for Service Components" on page 197.
7. Select the lifecycle substate (located directly beneath the lifecycle state diagram), if applicable.
8. In the **Lifecycle** window toolbar, select the **Create New Action** icon ( ).
9. Provide the information described in the table below.
10. After creating a new lifecycle action, specify values for the action input properties as described in "Edit Properties of a Lifecycle Action for a Service Component" on page 207.

Item	Description
Process Engine	Select a process engine, which is a container for process definitions. You can select either the Internal process engine or one of the HP Operations Orchestration (OO) engines.
Process Definition	Select a process definition, which is configured to run a specified internal action (see the table below for the list of internal actions) or external action.
Complete the following Identification fields:	
Display Name	The name you provide for the lifecycle action.
Description	The description you provide for the lifecycle action.
Marketplace Portal Options	These options are available only for actions created in stable lifecycle states. • Visible - Indicates that this lifecycle action will be available to be run in the Marketplace Portal.
Execution Order	The execution order for the lifecycle action, which is relative to other lifecycle actions for this lifecycle state or substate, if applicable. Lifecycle actions are executed in ascending order.

Item	Description
Execution Properties	Specify the following: • Fail on Error - If selected, this indicates that provisioning or de-provisioning will stop if the lifecycle action fails. The default selection is **false** for actions created in the Un-deploying, Un-reserving, and Un-initializing states. • Error on Timeout - If selected, this indicates that provisioning or de-provisioning will stop if the lifecycle action times out.
Timeout (seconds)	The time to wait until a timeout occurs for the lifecycle action. Set this field to zero (0) if you do not want the action to timeout.

See the following table for descriptions of the out-of-the-box internal actions that ship with CSA:

Internal Action	Description	Applies To
Build Resource Provider and Pool List	Builds a candidate list of resource providers and associated resource pools that meet the following requirements: • Support the resource offering referenced in a resource binding. • Have an **Availability** of **Enabled**. • If the service offering that references the service design with this action is in a service catalog with resource environments selected, the candidate list is further restricted to only include resource providers in one or more of the selected resource environments. • The provider's resource pool has sufficient resource capacity. To determine this, you must consider all measurable properties as configured in the **Measurable Properties** tab for the resource bindings, as well as the optional **Multiplier Property Name** field. The resource pool must have enough resource capacity to support all the properties, which requires that each necessary resource type (for example: CPU, Memory, and Storage), based on the measurable properties, be configured on the pool either with a **Resource Availability** of **Unlimited** or **Available**. If **Available**, the difference between **Total Available To CSA** and **Current CSA Utilization** must be sufficient to support the measurable property requirements.	• Resource Binding
Build Resource Provider List	Builds a candidate list of resource providers that meet the following requirements: • Support the resource offering referenced in a resource binding. • Have an **Availability** of **Enabled**. • If the service offering that references the service design with this action is in a service catalog with resource environments selected, the candidate list is further restricted to only include resource providers in one or more of the selected resource environments.	• Resource Binding

Internal Action	Description	Applies To
Clone Pattern	Clones a service component that is marked as a **Pattern** into one or more non-pattern service components. The number of service components created is determined by the value of the property specified in **Name of the Property for Service Component Count**.	• Service Component
Decrease Resource Utilization	Decreases the utilization of one or more resources in a resource pool by the values of the measurable properties configured on a resource binding. This action should be configured in the **Un-reserve** section of the **Resource Accounting** tab on a resource binding.	• Resource Binding
Increase Resource Utilization	Increases the utilization of one or more resources in a resource pool by the values of the measurable properties configured on a resource binding. This action should be configured in the **Reserve** section of the **Resource Accounting** tab on a resource binding.	• Resource Binding
Log Messages	Writes the user-specified Boolean Input, Integer Input, and String Input property values to the `csa.log` file. You can include this as an action on a Service Component, Resource Binding, or Resource Offering for use in troubleshooting.	• Resource Binding • Resource Offering • Service Component
Select Resource Pool from Provider	This internal action is deprecated and may be removed in a future HP CSA release. Use the **Select Resource Provider and Pool** action in conjunction with the **Build Resource Provider and Pool List** action in place of this action. Selects a resource pool from the set of resource pools associated with the selected resource provider. A resource pool must have an **Availability** of **Enabled** to be selected. The selected resource pool will be available to resource offering actions in the token `RSC_POOL_ID`.	• Resource Binding

Internal Action	Description	Applies To
Select Resource Provider	Selects a resource provider from the candidate list that was built by the **Build Resource Provider List** action. The selected resource provider will be available to resource offering actions in the token `RSC_PROVIDER_ID`. The selected provider will, optionally, be written to a property on the associated service component if the `Provider Property Name` input to the action is provided.	• Resource Binding
Select Resource Provider and Pool	Selects a resource pool and provider from the candidate list that was built by the **Build Resource Provider and Pool List** action. The selected resource provider and pool will be available to resource offering actions in the token `RSC_PROVIDER_ID` and `RSC_POOL_ID`, respectively. The selected pool will, optionally, be written to a property on the associated service component if the `Pool Property Name` input to the action is provided.	• Resource Binding
Select Resource Provider and Pool from Parent	Selects the resource pool and provider already chosen by a service component's parent service component, as identified by the `Parent Component ID` and `Pool Property Name` properties. The selected resource provider and pool will be available to resource offering actions in the token `RSC_PROVIDER_ID` and `RSC_POOL_ID` respectively. The selected pool will also be written to a `Pool Property Name` property on the associated service component.	• Resource Binding
Select Resource Provider from Parent	Selects the resource provider already chosen by a service component's parent service component, as identified by the `Parent Component ID` and `Provider Property Name` properties. The selected resource provider will be available to resource offering actions in the token `RSC_PROVIDER_ID`. The selected resource provider will also be written to a `Provider Property Name` property on the associated service component.	• Resource Binding

Delete a Lifecycle Action from a Service Component

For more information about lifecycles, see "Lifecycle Actions for Service Components" on page 197.

To delete a lifecycle action from a service component

1. In the left pane of the **All Designs** area, select the tag associated with the design you want to modify.
2. Select the service design.
3. In the **Designer** tab, select the service component from which you want to delete a lifecycle action.
4. In the right pane, select **Lifecycle**.
5. In the **Lifecycle** pane toolbar, select the **Edit** ( ) icon.
6. In the **Lifecycle** window, on the lifecycle state diagram, select the lifecycle state from which you want to delete an action. For more information about states and substates, see "Lifecycle Actions for Service Components" on page 197.
7. Select the lifecycle substate (located directly beneath the lifecycle state diagram), if applicable.
8. From the list of actions, highlight the action you want to delete.
9. In the toolbar, select the Delete ( ) icon.
10. Click **Yes** to confirm the deletion.

Edit Properties of a Lifecycle Action for a Service Component

For more information about lifecycles, see "Lifecycle Actions for Service Components" on page 197.

To edit the properties of a lifecycle action for a service component

1. In the left pane of the **All Designs** area, select the tag associated with the design you want to modify.
2. Select the service design.
3. In the **Designer** tab, select the service component for which you want to edit the properties of a lifecycle action.
4. In the right pane, select **Lifecycle**.

5. In the **Lifecycle** pane toolbar, select the **Modify Lifecycle Actions** ( ) icon.

6. In the **Lifecycle** window, on the lifecycle state diagram, select the lifecycle state for which you want to edit the properties of an action. For more information about states and substates, see "Lifecycle Actions for Service Components" on page 197.

7. Select the lifecycle substate (located directly beneath the lifecycle state diagram), if applicable.

8. From the list of actions, select the **Display Name** of the action whose properties you want to edit.

9. In the **Summary** tab, you can edit properties as described in the topic "Create a Lifecycle Action for a Service Component" on page 201.

10. In the **Properties** tab, you can specify action input properties whose values are passed to the process definition prior to invoking the action. Either type an input value or click the **Token** ( ) icon to select a token, which is a CSA system value that is automatically resolved internally when the property is read. Token values are available only for string properties and are not available for Boolean or integer properties. See the table below for a description of the tokens available for service component lifecycle actions.

11. The following properties are available only for each action input that is created in a stable lifecycle state:
    a. Visible - indicates that this action input property can be made visible in the Marketplace Portal.

    b. Editable - indicates that this action input property can be edited in the Marketplace Portal.

The following tokens are available for service component lifecycle actions:

Token	Description
Parent Service Component ID ([TOKEN:PRN_COMPONENT_ID])	Resolves to the Service Component ID of the parent service component.
Service Blueprint ID ([TOKEN:SVC_BLUEPRINT_ID])	Resolves to the Service Blueprint ID.
Service Catalog ID ([TOKEN:SVC_CATALOG_ID])	Resolves to the Service Catalog ID used at subscription time.

Token	Description
Service Component ID ([TOKEN:SVC_COMPONENT_ID])	Resolves to the Service Component ID of the component associated with this action.
Service Component Type ([TOKEN:SVC_COMPONENT_TYPE])	Resolves to the Service Component Type (for example, Server) of the component associated with this action.
Service Instance ID ([TOKEN:SVC_INSTANCE_ID])	Resolves to the Service Instance ID created at subscription time.
Service Offering ID ([TOKEN:SVC_OFFERING_ID])	Resolves to the Service Offering ID.
Service Request Organization ID ([TOKEN:REQ_ORG_ID])	Resolves to the Organization ID associated with the service request.
Service Request User ID ([TOKEN:REQ_USER_ID])	Resolves the User ID associated with the service request.
Subscriber's Email Address ([TOKEN:SVC_SUBSCRIPTION_EMAIL])	Resolves to email address of the subscriber.
Subscriber's Organization ID ([TOKEN:USR_ORG_ID])	Resolves to the Organization ID associated with the subscriber.
Subscription ID ([TOKEN:SVC_SUBSCRIPTION_ID])	Resolves to the Subscription ID created at subscription time.

Move a Lifecycle Action for a Service Component

For more information about lifecycles, see "Lifecycle Actions for Service Components" on page 197.

To move a lifecycle action for a service component

1. In the left pane of the **All Designs** area, select the tag associated with the design you want to modify.

2. Select the service design.

3. In the **Designer** tab, select the service component for which you want to move a lifecycle action.
4. In the right pane, select **Lifecycle**.
5. In the **Lifecycle** pane toolbar, select the **Modify Lifecycle Actions** ( ) icon.
6. In the **Lifecycle** window, on the lifecycle state diagram, select the lifecycle state that contains the action you want to move. For more information about states and substates, see "Lifecycle Actions for Service Components" on page 197.
7. Select the lifecycle substate (located directly beneath the lifecycle state diagram), if applicable
8. From the list of actions, highlight the action you want to move.
9. In the toolbar, select the **Move Selected Action to New Lifecycle State** ( ) icon.
10. Provide the following information:

Item	Description
Target Lifecycle State	Select the new state for the lifecycle action.
Target Lifecycle Substate	Select the new substate, if applicable, for the lifecycle action. For more information about states and substates, see "Lifecycle Actions for Service Components" on page 197.
Target Lifecycle Execution Order	Specify the execution order for the lifecycle action relative to other lifecycle actions for this lifecycle state. Lifecycle actions are executed in ascending order.

Subscriber Options

For more information about sequenced designs, see "Sequenced Designs" on page 158.

The **Subscriber Options** tab allows you to create sets of options for a service design. The option sets are made available in the **Offerings** area of the Cloud Service Management Console, where they can be further refined by setting pricing for options, hiding options and setting values for option properties. The subscriber options are then exposed to Subscribers in the Marketplace Portal.

These options allow the user to select values that customize the service offering for their personal needs.

The option sets are made available in the Offerings area of the Cloud Service Management Console, where they can be further refined by setting pricing for options, hiding options and setting values for option properties. The subscriber options are then exposed to Subscribers in the Marketplace Portal.

For example, you can create an option set called *Number of Servers*, which is configured as follows:

- The option set has three options, *Small*, *Medium*, and *Large*.
- Each option has a property called NSERVERS.
- Each option has a unique, specified value for NSERVERS, either *Small* (2 servers), *Medium* (4 servers), or *Large* (8 servers).
- A binding is created from the NSERVERS property to a corresponding NSERVERS property on a Server Group service component. This use of a subscriber option to push a value to a custom service component property is called a *target binding*, described below.
- In the Marketplace Portal, subscribers can select the option that provides the desired number of servers.

Target Bindings

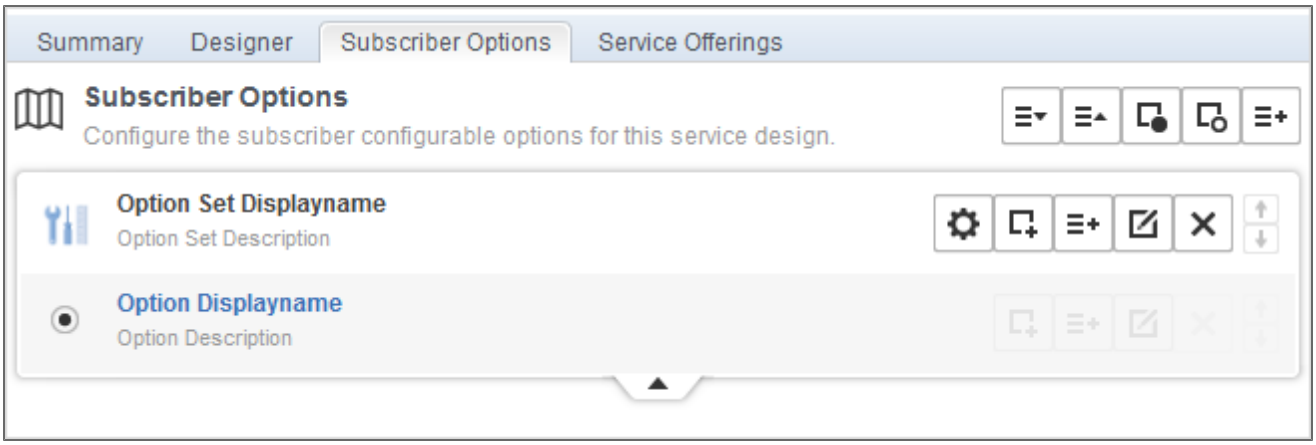
You may have a service component that is configured to expect a property value with a given name and specified value to be provided by a subscriber option. You can configure a binding on a subscriber option so that it sends the value to the appropriate service component property. This use of a subscriber option to push a value to a custom service component property is called a *target binding*.

For example, you may want to let the Subscriber select the number of CPUs for a server. You can create a custom service component property (for example, `NCPU`) on the Server component and specify a target binding that pushes the Subscriber-entered value to the corresponding `NCPU` Server property.

Another type of value binding is called *source binding*. For more information about source bindings, see "Custom Service Component Properties" on page 172.

To use the subscriber options controls

The controls for working with subscriber options are shown and described below.



Subscriber Options Controls

Item	Description
	Click to expand all option sets.
	Click to collapse all option sets.
	Click to show all properties.
	Click to hide all properties.
	Click to add a new option or option set.
	Click to configure advanced settings (see "Configure Advanced Settings for a Subscriber Option Set" on page 215).
	Click to create properties (see "Create Subscriber Option Properties" on page 216).
	Click to edit one of the following: • Option set, as described in "Edit Subscriber Option Sets and Options" on page 222. • Option, as described in "Edit Subscriber Option Sets and Options" on page 222. • Property, as described in "Edit Subscriber Option Properties" on page 221.

Subscriber Options Controls, continued

Item	Description
✕	Click to delete one of the following: • Option set, as described in "Delete Subscriber Option Sets and Options" on page 223. • Option, as described in "Delete Subscriber Option Sets and Options" on page 223. • Property, as described in "Delete Subscriber Option Properties" on page 222.
↑ ↓	Click to move the option set or option up or down in the list.
▼ ▲	Click to expand or collapse the option set.

See the following related topics:

- "View Subscriber Options" below
- "Create Subscriber Option Properties" on page 216
- "Configure Advanced Settings for a Subscriber Option Set" on page 215
- "Delete Subscriber Option Sets and Options" on page 223
- "Edit Subscriber Option Sets and Options" on page 222

View Subscriber Options

For more information about subscriber options, see "Subscriber Options" on page 210.

The **Subscriber Options** tab is read-only if any service offerings have been created using the selected service design. Option sets and options can be created in a hierarchy of options sets and options. This provides a way to group the layout of options to be more meaningful to the Subscriber.

To view subscriber options

1. In the left pane of the **All Designs** area, select the tag associated with the design you want to view.

2. Select the service design.

3. Select the **Subscriber Options** tab where you see the option sets and options for the service design.

Add Subscriber Option Sets and Options

For more information about subscriber options, see "Subscriber Options" on page 210.

The **Subscriber Options** tab is read-only if any service offerings have been created using the selected service design.

To add a subscriber option set or option

1. In the left pane of the **All Designs** area, select the tag associated with the design you want to modify.

2. Select the service design.

3. In the **Subscriber Options** tab, do one of the following:
   - Click the + **Create Option Set** icon to create an initial option set.
   - To create an option set click the **Add Option Set** (☰+) icon in the upper right of the **Subscriber Options** tab.
   - To add an option to an option set, click the **Add Option** (☰+) icon in the selected option set toolbar.
   - To add an option set to an option, click the **Add Option Set** (☰+) icon in the option set toolbar. You can use this functionality to create a hierarchy of option sets that is three levels deep:
     - **Option Set 1**
       - Option
         - **Option Set 2**
           - Option
             - **Option Set 3**
               - Option

See the following related topics:

- "Configure Advanced Settings for a Subscriber Option Set" below
- "Create Subscriber Option Properties" on the facing page
- "Edit Subscriber Option Sets and Options" on page 222
- "Delete Subscriber Option Sets and Options" on page 223

For descriptions of the additional icons available on the **Subscriber Options** tab, see "Subscriber Options" on page 210.

Configure Advanced Settings for a Subscriber Option Set

For more information about subscriber options, see "Subscriber Options" on page 210.

The **Subscriber Options** tab is read-only if any service offerings have been created using the selected service design.

To configure advanced settings

1. In the left pane of the **All Designs** area, select the tag associated with the design you want to modify.
2. Select the service design.
3. Select the **Subscriber Options** tab.
4. In the toolbar for the option set, click the **Advanced settings** ( ) icon.
5. Turn the following on or off, as desired:
   - **Show Properties** - Turn on to show the list of properties configured for the options in an option set. This setting affects the visibility of properties for the options in an option set only in the context of the **Subscriber Options** tab; it does not impact whether properties are visible in the Marketplace Portal. To reduce the amount of information shown in this tab, you can set **Show Properties** to **Off** when you are not manipulating option properties.
   - **Multi-Select** - Turn on to present options as check boxes in the Marketplace Portal.
   - **Initial Order Only** - Turn off to allow a service consumer to change the selected values of this option set when modifying the subscription in the Marketplace Portal. Turn on to prevent

the service consumer from modifying this option set in the Marketplace Portal after a subscription has been ordered.

Create Subscriber Option Properties

For more information about subscriber options, see "Subscriber Options" on page 210.

The **Subscriber Options** tab is read-only if any service offerings have been created using the selected service design.

You can create properties on either an entire option set or on a specific option within the set. When you create a property on the entire option set, the property is added to each option within the set. Note that you cannot create properties on an entire option set when the **Enable Multi-Select** setting for that option set is selected (set to `true`).

To create a subscriber option set or option property

1. In either the option set or the option toolbar, select the **Create a Property** ( ) icon.
2. Provide the following information

Item	Description
Property Type	Select one of the following: • **Boolean** - A property whose value is true or false. • **List** - A property where you can define a list of values for the Subscriber to select. • **Integer** - A property whose value is a positive or negative whole number or zero. • **String** - A property whose value is a sequence of characters.

Item	Description
Property Details	***For Boolean properties:*** • **Name** - A unique name for the property. • **Display Name** - The display name for the property. • **Description** - A description of the property. • **Marketplace Portal & Service Offering Options**: ▪ **Editable** - Indicates that this property can be made editable in the **Offerings** area and in the Marketplace Portal. ▪ **Required** - Boolean properties are always required, which means that when a subscription is ordered, a value must be provided for this field. This option cannot be changed for Boolean properties. • **Value** - Select **true** or **false**. ***For List properties:*** • **Name** - A unique name for the property. • **Display Name** - The display name for the property. • **Description** - A description of the property. • **Marketplace Portal & Service Offering Options**: ▪ **Editable** - Indicates that this property can be made editable in the **Offerings** area and in the Marketplace Portal. ▪ **Required** – Select to indicate that when a subscription is ordered, a value must be provided for this field. Note that this field is available only when the **Enable Multi-Select** option is selected. Single-select list properties are always required; this field cannot be changed for single-select properties. • **Value Entry Method:** ▪ **Manual Entry** - Click the **Add Value** (+) icon to add a new value, or click the **Remove Selected Value(s)** icon (—) to remove a selected value. After adding a List property, you can choose a default value (or values, for multi-select lists) by selecting one or more values from the drop down list for the property in the **Subscriber Options** tab. Click **Save** to save the default

Item	Description
	value selection. ■ **Select Dynamic Query**: ○ Click the **Script Selection** ( ) icon to select a **Script Name**. To add new scripts, place them in the folder: `%CSA_HOME%\jboss-as-7.1.1.Final\standalone\deployments\csa.war\propertysources` Note: The script is invoked at subscription ordering or modification time by the out-of-the-box CSA user `csaReportingUser`, who has read-only access to HP CSA. For more information on this user, see the *HP Cloud Service Automation Configuration Guide*. ○ Specify an HTTP Request Body to be passed to the script. The contents of the HTTP Request Body need to include the information required by the selected script to return the appropriate set of dynamic values. To include a token in the HTTP Request Body, click the **Token Request** ( ) icon and select from the available tokens. The token is a CSA system value that is automatically resolved internally when the property is read. Click **Test Query** to test the dynamic query results (note that tokens are resolved only at subscription time, and this test will pass literal values). Note: The script is invoked at subscription ordering or modification time by the out-of-the-box CSA user `csaReportingUser`, who has read-only access to HP CSA. For more information on this user, see the HP Cloud Service Automation Configuration Guide. ○ You can select from the following server-side tokens: ○ Action Name - Resolves to the value of ORDER when initially ordering a subscription and to the value of MODIFY_SUBSCRIPTION when modifying an existing subscription. ○ Service Blueprint ID - Resolves to the Service Blueprint ID. ○ Service Instance ID - Resolves to the Service Instance ID. ○ Service Offering ID - Resolves to the Service Offering ID.

Item	Description
	◦ Service Request Organization ID - Resolves to the Organization ID associated with the Service Request. ◦ Service Request User ID - Resolves to the User ID associated with the Service Request. ◦ Subscription ID - Resolves to the Subscription ID created at subscription time. ◦ You can also select the following client-side token: ◦ [`CLIENT:<property_name>`] - Allows you to have a dependency on a value from another list property, which means that if a value is selected in "Property A", for example, the list of values in "Property B" will change based on that selection. "Property A" and "Property B" must exist within the same Subscriber Option. Note that `<property_name>` refers to the property **Name**, and not its **Display Name**. For the **Test Query** functionality to work for the above example, you must first create and save "Property A" in the Cloud Service Management Console before you create its dependent property, "Property B." ▪ **Enable Multi-Select** - Select to present options as check boxes in the Marketplace Portal. ***For Integer properties***: • **Name** - A unique name for the property. • **Display Name** - The display name for the property. • **Description** - A description of the property. • **Marketplace Portal & Service Offering Options**: ▪ **Editable** - Select to make this field editable in the **Offerings** area and in the Marketplace Portal. ▪ **Required** – Integer properties are always required, which means that when

Item	Description
	a subscription is ordered, a value must be provided for this field. This option cannot be changed for Integer properties. • **Value** - Select or type a positive or negative whole number or zero. If you enter a decimal number, the value will be truncated to the nearest integer. • **Input Validation** ▪ Select **Enable Input Validation** to validate the value that the user enters for this property. When selected, the following fields are available: ○ **Minimum Value** - Enter a number for the minimum value allowed, which means the value for the property must be greater than or equal to the number you enter. ○ **Maximum Value** - Enter a number for the maximum value allowed, which means the value for the property must be less than or equal to the number you enter. ***For String properties:*** • **Name** - A unique name for the property. • **Display Name** - The display name for the property. • **Description** - A description of the property. • **Marketplace Portal & Service Offering Options**: ▪ **Editable** - Select to make this field editable in the **Offerings** area and in the Marketplace Portal. ▪ **Required** – Select to indicate that when a subscription is ordered, a value must be provided for this field. Note that this field is available only when the **Editable** option is selected. • **Value** - Type a string of characters. • **Confidential data** - Select this box to mask the values so that they cannot be read in the user interface; no encryption of the value is performed. • **Input Validation** ▪ Select **Enable Input Validation** to validate the value that the user enters for this property.

Item	Description
	▪ Choose an **Input Restriction** from the following list: ○ **Custom Regular Expression** - Validates the value based on a regular expression, as specified in the **Regular Expression** text box. ○ **Email Address** - Checks that a valid email format is entered. ○ **IPV4 Address** - Checks that a valid IPV4 address is entered. ○ **IPV6 Address** - Checks that a valid IPV6 address is entered. ○ **Non-Numeric Characters** - Checks that no numeric characters are entered. ○ **URL Address** - Checks that a valid URL format is entered. ▪ **Minimum Length** - Enter a number for the minimum length allowed for the value, which means the length of the value must be greater than or equal to the number you enter. ▪ **Maximum Length** - Enter a number for the maximum length allowed for the value, which means the length of the value must be less than or equal to the number you enter.
Property Bindings	Select the service component to which you want to push the value of this property. Then select the appropriate property from the list of compatible properties. This is called a target binding. For more information about target bindings, see "Subscriber Options" on page 210.

3. Click **Create**.

Edit Subscriber Option Properties

For more information about subscriber options, see "Subscriber Options" on page 210.

To edit a subscriber option set or option property

1. In the left pane of the **All Designs** area, select the tag associated with the design you want to modify.

2. Select the service design.

3. In the **Subscriber Options** tab, expand the option set whose property you want to edit.
4. Highlight the property you want to edit.
5. Select the **Edit Property** ( ) icon.
6. For descriptions of the specific properties, see the topic "Create Subscriber Option Properties" on page 216.

Delete Subscriber Option Properties

For more information about subscriber options, see "Subscriber Options" on page 210.

To delete a subscriber option set or option property

1. In the left pane of the **All Designs** area, select the tag associated with the design you want to modify.
2. Select the service design.
3. In the **Subscriber Options** tab, expand the option set from which you want to delete a property.
4. Highlight the property you want to delete.
5. Select the **Delete Property** ( ) icon.

Edit Subscriber Option Sets and Options

For more information about subscriber options, see "Subscriber Options" on page 210.

The **Subscriber Options** tab is read-only if any service offerings have been created using the selected service design.

To edit subscriber option sets or options

1. In the left pane of the **All Designs** area, select the tag associated with the design you want to modify.
2. Select the service design.

3. Select the **Subscriber Options** tab.

4. In the toolbar for the option set or option you want to edit, click the **Edit Option Set** or **Edit Option** ( ) icon.

5. Edit the following, as desired:
   - **Display Name** - The display name for the option set or option.
   - **Description** - A description for the option set or option.
   - **Image** - An image that displays for the option set. Click **Change Image**. Choose the image you want, and click **Select**. Click **Upload Image** to add your own image. Supported file extensions include `.jpg`, `.jpeg`, `.gif`, and `.png`. The recommended image size is 256 by 256 pixels, and the image will be scaled to the appropriate size. The images are stored in the `%CSA_HOME%\jboss-as-7.1.1.Final\standalone\deployments\csa.war\images\library` folder of the HP CSA server. The image you select will be displayed in the **Offerings** area and in the Marketplace Portal

6. Click **Save**.

Delete Subscriber Option Sets and Options

For more information about subscriber options, see "Subscriber Options" on page 210.

The **Subscriber Options** tab is read-only if any service offerings have been created using the selected service design.

To delete subscriber option sets or options

1. In the left pane of the **All Designs** area, select the tag associated with the design you want to modify.

2. Select the service design.

3. In the **Subscriber Options** tab toolbar for the option set or option, click the **Delete** ( ) icon.

4. Click **Yes** to confirm the deletion.

Manage Tags

To manage tags

Tags are a label you can use to provide a structure for organizing and grouping related items.

1. In the lower, left pane, click the **Manage Design Tags** ( ) icon.
2. In the **Manage Tags** screen, you can do the following:

- "Create a Tag" below
- "Edit a Tag" on the next page
- "Delete a Tag" on the next page

Create a Tag

For more information about tags, see "Manage Tags" above.

To create a tag

1. In the left pane, click the **Manage Design Tags** ( ) icon.
2. Click the **Add** icon (+).
3. Provide the following information, and click **Create**:
   a. **Display Name** - The name you provide for this tag.
   b. **Description** - The description you provide for this tag.
   c. **Image** - An image that displays for the tag. Click **Change Image**. Choose the image you want, and click **Select**. Click **Upload** to add your own image. Supported file extensions include `.jpg`, `.jpeg`, `.gif`, and `.png`. The recommended image size is 256 by 256 pixels, and the image will be scaled to the appropriate size. The images are stored in the `%CSA_HOME%\jboss-as-7.1.1.Final\standalone\deployments\csa.war\images\library` folder of the HP CSA server.
   d. **Color** - A color that displays for the tag.

4. Click **Done**.

Select a Tag

For more information about tags, see "Manage Tags" on the previous page.

To select a tag

1. In the **Select Tag** view, select one or more tags.
2. Click **Done**.

Edit a Tag

For more information about tags, see "Manage Tags" on the previous page.

To edit a tag

1. In the lower, left pane, click the **Manage Design Tags** ( ) icon.
2. Click the **Edit** icon ( ).
3. Provide the desired information, and click **Save**. For information about the specific fields, see "Create a Tag" on the previous page.
4. Click **Done**

Delete a Tag

For more information about tags, see "Manage Tags" on the previous page.

To delete a tag

1. In the lower, left pane, click the **Manage Design Tags** ( ) icon.
2. Select the tag you want to delete.

3. Click the **Delete** icon ( ).
4. Click **Yes** to confirm the deletion.
5. Click **Done**.

Topology Designs

Use the **Designs** area of the Cloud Service Management Console dashboard to manage service designs, which are the recipes for automating the cloud. You can create the following types of designs:

- **Sequenced Design** - Sequenced designs specify directed execution of service component lifecycles. Use sequenced designs for complex services and services that rely on run book automation, such as integrations with legacy data center systems. Create a sequenced design as a directed component hierarchy to define lifecycle execution. Sequenced designs use components to group multiple automation providers within a single entity. Sequenced designs permit explicit specification of lifecycle actions.
- **Topology Design** - Used only for HP Cloud OS infrastructure, topology designs specify components and their relationships to define the service lifecycle. Use topology designs for straightforward IaaS deployments. Create a topology design in a free-form component layout where connection relationships implicitly define the service fulfillment lifecycle. Each topology design component binds to a single provider for fulfillment automation. Topology designs delegate lifecycle sequencing to providers.

HP Cloud OS is the provider for Topology Designs. Available nodes and connectors are determined by the version of OpenStack you select within HP Cloud OS, e.g., Essex, Diablo, Grizzly. After you create and save a design, you add nodes and connectors to the design and set properties in the **Editor** tab. Use the **Validation** tab at any time to view details about design errors.

After creating the design, you can create one or more **Profiles** based on that design which allow you to override some of the topology design properties. Profiles create an association to a binding document and allow you to set different values for any node or connector configured in the original design, such as flavors, images, etc.This profile is then available in the **Offerings** area of the Cloud Service Management Console, where it can be further refined by setting pricing, showing or hiding options, and setting values for properties.

Topology Designs opens displaying a list of existing designs and their status in the Browse Designs window.Tasks in Topology Designs are organized within the following tabs:

Tab	Description	Available Tasks
"Browse Designs" on page 229	A list of existing topology designs and their status.	• **View design details** - clicking a design opens it in the **Overview** tab. • **Manage Tags** - where you create new and manage existing tags. • **Create** - create a new topology design. • **Import** - import an external design.
"Overview Tab" on page 237	Displays the details of the selected design: • Description • Tags • Validation Status • Properties • Structure Overview • Topology diagram	• **Edit** - the design properties. • **Save as** - make a copy of a design. • **Publish/Unpublish** - published designs can be used to create service offerings. • **Export** - export the design to another HP Cloud Service Automation instance. • **Delete**

Tab	Description	Available Tasks
"Editor " on page 240	A canvas area used to layout the design and add nodes, connectors, and properties. Use the **Validation** tab if you need more details about errors within the **Editor**.	• **Edit** - the design properties. • Add/change nodes. • Add/change connectors. • Add/change node and connector properties. • **Publish/Unpublish**
"Profiles" on page 252	Similar to an option set, profiles are named configurations that allow you to override the original configuration of a design.	• View existing profiles. • **Create** - a new profile.
"Validation" on page 255	Provides details about design errors in the **Editor** and **Profiles** areas. The following artifacts are validated: • Document properties • Node properties • Connector properties • Profiles	View validation error details and link back to the source to correct.

High-Level Topology Design Work Flow

The following is a summary of the topology design work flow steps necessary to successfully create and publish a topology design to provide service delivery to customers:

Prerequisites:

From the Cloud Service Management Console dashboard:

1. Create an HP Cloud OS resource provider in the **Resources** tab.

2. Set the **Tenant** property on the newly created provider to identify the OpenStack tenant.

Topology Designer tasks:

4. From **Designs**, select **Topology Designs**.

5. Create a new design, and add nodes and connectors in the **Editor**.

6. Optionally create configuration **Profile**(s) for the design.

7. Publish the design, which can then be used to create a service offering.

Subscriber steps to request a service:

8. Create a service offering and add options, pricing, documents, and/or screenshots to the offering.

9. Publish the offering to a catalog.

10. In Marketplace Portal, service offerings are exposed to subscribers within the Browse Catalogs area.

11. Optionally edit the configuration of offerings.

12. Checkout.

13. Complete the order info and submit the request.

14. Request status is available in the Marketplace Portal and is also available in the Cloud Service Management Console dashboard within the **Operations** area.

Browse Designs

To browse designs

1. From the Cloud Service Management Console dashboard, click **Designs** and then click **Topology**.

2. The **Browse Designs** window opens. If tags have been defined for your topology designs, an image and a tag name display in the left panel.Tags are color-coded labels you use to provide a structure for organizing and grouping topology designs. The right panel is a dynamic list of designs within the selected tag category. The design list displays the image associated to the design, its **Name**, **Description**, and **Published** status.

To filter the design list

By default, all designs display alphabetically **By Name** when you open Topology Designs.

Other options to reorder or filter the design list:

- Click a category tag in the left column to filter the list of designs by that category.
- Click the arrow in the **By Name** field and select **Recently modified**.
- Click in the Search field ( ) and enter the first few characters of the search string.

Tasks available from the Browse Designs window:

- "Manage Tags" on page 234
- "View Design Details" below
- "Designing the Topology Layout" on page 242
- "Import a Topology Design" on page 233

View Design Details

1. From the Cloud Service Management Console dashboard, click **Designs** and then click **Topology**.
2. Within the **Browse Designs** window, select a design. See "Browse Designs" on the previous page for more information on how to filter the list of designs.
3. A view-only graphical representation of the design layout opens in the right panel of the **Overview** tab with the following details displayed on the left:

- **Description** - description of the topology design provided during creation.
- **Cloud OS Provider** - The HP Cloud OS provider configured in the **Resources** area of the Cloud Service Management Console.
- **Cloud OS Profile** - Defines the version of OpenStack to which you are deploying within HP Cloud OS.
- **Resource Pool** - The Resource Pool selected during creation.
- **Category Tags** - If the design was associated to one or more category tags, they are listed here.
- **Validation status** - Indicates the validation status of the four validation categories.

- **Structure Overview** - Shows the number of nodes and connections.

Create a New Topology Design

In order to create a valid topology design that can be used for provisioning, you must follow these two steps:

1. Create the topology design using the design wizard.
2. Create a free-form component layout of networking nodes and connectors. See "Designing the Topology Layout" on page 242.

Create New Design Wizard

The Create New Design wizard guides you through the topology design creation process. Steps within the wizard are listed sequentially in the left panel of this window; the right panel is dynamic depending on the selected step. Within each step, required fields are indicated with a red asterisk.

As you complete each step, a check mark is placed to the left of the step. Click **Next** to follow the wizard, click **Previous** to move up a step and remove the completion check mark. Clicking **Finish** saves the design, closes the wizard, and opens the design in the **Editor**. **Cancel** to close the wizard without saving.

Tags and **Images** are optional when creating a design. Tags provide a way to categorize or group designs by color and an associated image. If you assign an image to a tag, it displays with the name when you are in **Browse Designs**.

Validation is a continuing process during creation and editing.You cannot save the design until the required field information for each step has been entered in the wizard. See "Validation" on page 255 for more detailed information.

To create a topology design

1. From the Cloud Service Management Console dashboard, click **Designs** and then click **Topology**.
2. From Browse Designs, click **Create**. The Create New Design wizard opens.
3. Provide the following information, clicking **Next** to move to the next step. A check mark displays as you progress through the steps.

Step Category	Field	Description
General	Name*	Enter a unique, descriptive name for the design, with or without spaces.
	Description	Provide details about the design, e.g., size, operating system, etc.
Cloud OS Specification	Cloud OS Provider*	Select a provider from those configured in the **Resources** area of the Cloud Service Management Console.
	Cloud OS Profile*	Corresponds to the version of OpenStack to which you are deploying within HP Cloud OS, e.g., Grizzly or Havana. Your selection here determines which node types are available during design layout in the **Editor**.
	Resource Pool	Optionally select a Resource Pool, which is a pool of resources associated with the resource provider. NOTE: Not selecting a resource pool at this time keeps the design portable so you can export it and import into another HP Cloud Service Automation instance.The **Image, Machine Flavor,** and **Key Name** node properties within a Server Group are dependent on your **Resource Pool** selection. Selecting a resource pool at this time allows you to set these properties in the **Editor** (see "Designing the Topology Layout" on page 242).
Tags	*Optional*	Select from the list of defined tags, if available. To create a new tagor edit an existing tag, click the **Manage Tags** link. For more information about tags, see "Manage Tags" on page 234
Image	*Optional*	Select an image to associate to this design, then click **Finish**.If you want to skip the Image selection, just click **Finish**. To upload your own image, click the **Upload Image** link. All standard image formats are accepted. The image selected here appears with the design name in **Browse Designs.**

*Required

4. Click **Finish**. The design opens in the **Editor**, where you can add nodes and connectors. See "Designing the Topology Layout" on page 242.

Import a Topology Design

The import process imports archives of topology designs and their supported artifacts. Before importing, you will be required to select the target HP Cloud OS Provider and a specific resource pool to assign to the imported topology.

Successful import is dependent on whether the selected Provider supports all incoming components and properties. Property values in the design that depend on the resource pool will be preserved if possible. If property values cannot be preserved, the report generated from the import will indicate which values were kept and which were discarded.

Prerequisites

An HP Cloud OS Provider must be configured in the **Resources** area of the Cloud Service Management Console. While associating the provider with an environment is optional, it may be necessary for service offering publishing and provisioning.

To import a topology design

1. From the Cloud Service Management Console dashboard, click **Designs** and then click **Topology**.

2. From **Browse Designs**, click the **Import** button.

4. Enter or click (...) to specify the **Archive File** (.zip file) that contains the service design you want to import. Archive filenames for service designs begin with `SERVICE_DESIGN_`.

5. Select the **HP Cloud OS Provider** and the **Resource Pool** to assign to the imported topology. The target HP Cloud OS Provider should support all the components used in the design.

6. Select an **Action**:
   a. **Import** - imports the design from the selected archive if it does not already exist.

   b. **Update** - imports new service designs (and associated resource offerings) and updates (overwrites) existing service designs. Check **Preserve Originals** to create backup copies of the original items, appending "Superseded on" and the date to the artifact display names and descriptions.

7. Click **Preview**, then click the link to the HTML form to view the status of the import, which includes details about matched dynamic values and missing values. Missing values will cause the import to fail.

8. Click **OK**.

Manage Tags

Tags are user-defined, color-coded labels and images used to provide a structure for organizing and grouping topology designs. Once created and associated to a design, tags display with the design name in **Browse Designs**.

The only pre-created category is labeled **All**, which is where all designs are stored if you do not create any tags. You cannot edit, delete, or assign the **All** category.

Tagging is an option during design creation and editing.A design can be assigned to multiple tag categories.

To manage tags

1. From the Cloud Service Management Console dashboard, click **Designs** and then click **Topology**.

2. Within **Browse Designs**, existing tag categories display in the left panel with color-coded circles. Clicking a tag in the left panel displays the designs within that category on the right. See "Browse Designs" on page 229 for more information on how to filter the list of designs.

3. To manage tags, click **Tags** on the **Browse Designs** window.

For more information, see:

- "Create a Tag" on the next page
- "Edit a Tag" on page 236
- "Delete a Tag" on page 236
- "Associate a Tag to a Design" on the next page

Create a Tag

For more information about tags, see "Manage Tags" on the previous page.

You can create as many tags as needed to organize your topology designs. The only pre-created category is labeled **All**, which is where all designs are stored iif you do not create any tags.

To create a tag

1. From the Cloud Service Management Console dashboard, click **Designs** and then click **Topology**.
2. From **Browse Designs**, click **Tags**.
3. In the **Manage Tags** dialog box, click **Create**.
4. Provide the following information:
   a. **Name (required)** - The tag name.
   b. **Color** - The tag color.
   c. **Image** - An image that is associated with this tag. Click on the image placeholder to view available pre-loaded images. Select the image you want. Click the **Upload Image** link to add your own image. Supported file extensions include `.jpg`, `.jpeg`, `.gif`, and `.png`. The recommended image size is 256 x 256 pixels, and the image will be scaled to the appropriate size.
   d. **Description** - A description of the tag category.
5. Click **Save**.

Associate a Tag to a Design

For more information about tags, see "Manage Tags" on the previous page.

Associating your design to one or more tags is optional, and can be done during design creation or editing. See "Create a New Topology Design" on page 231 or "Edit a Topology Design" on page 250.

Edit a Tag

For more information about tags, see "Manage Tags" on page 234. Changes to tags are immediately reflected in associated designs upon save. The **All** category tag cannot be edited.

To edit a tag

1. From the Cloud Service Management Console dashboard, click **Designs** and then click **Topology**.
2. From **Browse Designs**, click **Tags**.
3. In the **Manage Tags** dialog box, select the tag to edit.
4. Update the fields as necessary. For information about specific fields, see "Create a Tag" on the previous page.
5. Click **Save**.

Delete a Tag

For more information about tags, see "Manage Tags" on page 234.

You are not prompted to confirm when deleting a tag, so use this option carefully. Deleting a tag removes it from any design to which it was associated. The **All** category tag cannot be deleted.

To delete a tag

1. From the Cloud Service Management Console dashboard, click **Designs** and then click **Topology.**
2. From **Browse Designs**, click **Tags**.
3. In the **Manage Tags** dialog box, select the tag to delete.
4. Click **Delete**.
5. Click **Save.**

Overview Tab

The **Overview** tab opens with the selected design details on the left and a visual representation of the topology design networking layout on the right.

To view design details

1. From the Cloud Service Management Console dashboard, click **Designs** and then click **Topology**.
2. Within the **Browse Designs** window, select a design. See "Browse Designs" on page 229 for more information on how to filter the list of designs.
3. The design opens in the **Overview** tab with the following details:

- **Description** - The description of the design (entered during creation).
- **Tags** - Identifies the color-coded category tag(s) of the design. For more information, see "Manage Tags" on page 234.
- **Validation status** - Indicates the status of the four validation categories (Document, Nodes, Relations, and Profiles). For more information, see "Validation" on page 255.
- **Structure Overview** - Displays a count of nodes and connections in the topology design..

From the **Overview** tab, you can also:

"Edit Design Properties" below

"Copy a Design " on the facing page

"Publish a Design" on page 239

"Export a Topology Design" on page 239

"Delete a Topology Template" on page 240

Edit Design Properties

Basic design properties that were set during creation using the wizard can be edited in both the **Overview** and **Editor** tabs. In the **Overview** tab you can only change the Resource Pool of the original design.

To edit design properties

1. From the Cloud Service Management Console dashboard, click **Designs** and then click **Topology**.
2. Within the **Browse Designs** window, select a design. See "Browse Designs" on page 229 for more information on how to filter the list of designs.
3. The design opens in the **Overview** tab.
4. Click **Edit** to open the Edit Properties dialog box.
5. Edit as needed. See "Create a New Topology Design" on page 231 for specific field information.
6. When you are done editing, click **Finish** to return to the **Overview** tab.
7. Click **Save**.

Copy a Design

Using **Save As** makes a copy of a design and all its components, including categories, topology, and profiles.

1. From the Cloud Service Management Console dashboard, click **Designs** and then click **Topology**.
2. Within the **Browse Designs** window, select a design. See "Browse Designs" on page 229 for more information on how to filter the list of designs.
3. The design opens in the **Overview** tab.
4. Click **Save as...**
5. Enter a new **Name** or keep the default which appends "copy of" to the original design name.
6. Edit the **Description** as needed.
7. Click **Save**.

Publish a Design

A topology design has a status of **Published** or **Unpublished**. The status can be viewed in Browse Designs and can be changed in the **Overview** tab. By default, a design is **Unpublished** and cannot be used to create a service offering. A service offering is created from a service design and allows you to specify certain values and properties before the offering is assigned to a service catalog.

Published status indicates the design has no validation errors, it has a resource pool assigned, and it can be used to create a service offering.Only published designs can be deployed. **Published** designs can be **Unpublished** to make them unavailable for a service offering.

To publish a design

1. From the Cloud Service Management Console dashboard, click **Designs** and then click **Topology**.
2. From Browse Designs, select an unpublished design. See "Browse Designs" on page 229 for more information on how to filter the list of designs.
3. The design opens in the **Overview** tab.
4. Click **Publish.** If the design has no validation errors, publish is successful and the button in the lower portion of the window changes to **Unpublish**.

To unpublish a design

1. Follow steps 1-3 above.
2. Click **Unpublish**. The **Publish** button becomes available and within Browse Designs the status is blank.

Export a Topology Design

The export process takes all the topology files, including the design in XML format, and creates a content archive (.zip) file. Exporting is used to transfer the design to another system or an HP Cloud Service Automation instance configured with an HP Cloud OS Provider. Exporting is also used for data backup.

Configuring a design for export

The design must have no validation errors and you must specify a Resource Pool before exporting a design.

For more information about specifying a Resource Pool, see "Create a New Topology Design" on page 231.

To export a design

1. From the Cloud Service Management Console dashboard, click **Designs** and then click **Topology**.
2. From **Browse Designs**, click the design to export.
3. From the **Overview** tab, click **Export**. A dialog box opens prompting you to save the archive (.zip) file.
4. Click **Save**.

Delete a Topology Template

1. From the Cloud Service Management Console dashboard, click **Designs** and then click **Topology**.
2. Within the **Browse Designs** window, click the design to delete.
3. The template opens in the **Overview** tab.
4. Click **Delete**. A confirmation dialog box opens.
5. Click **Yes**. You are returned to Browse Designs and the template is no longer available.

Editor

The **Editor** within Topology Designs is where you design a logical and visual representation of the layout of networking components and the connectivity of those components to each other. You create an infrastructure design in a free-form component layout by:

- Adding nodes
- Adding relationship connectors
- Configuring properties for nodes and relationships
- Editing properties for nodes and relationships

To edit an existing design

1. From the Cloud Service Management Console dashboard, click **Designs** and then click **Topology**.
2. From **Browse Designs**, select the design to edit.
3. Click on the **Editor** tab. For more information, see "Edit a Topology Design" on page 250.

To create a new design

1. From Browse Designs, click **Create**. A blank design opens in the **Editor** tab. For more information, see "Create a New Topology Design" on page 231.

To use the editor controls

When you open the **Editor**, the following controls are available in the left toolbar:

✖	Delete selected item.
	Zoom in. **NOTE**: You can also use the wheel on your mouse to zoom in and out within the Editor.
	Zoom out.
	Zoom the design to fit the window.

Related topics:

"Create a New Topology Design" on page 231

"Designing the Topology Layout" on the facing page

"Edit a Topology Design" on page 250

"Publish a Design" on page 239

Designing the Topology Layout

For information on how to create a new design, see "Create a New Topology Design" on page 231

After creating the design, you then design the free-form component layout of nodes and their connections in the **Editor**.

To create the design layout

Nodes

As you move your cursor around the canvas in the **Editor**, gray tiles display. Clicking a tile presents you with a list of available node types to select. Before a topology design can be created, HP Cloud Service Automation queries the available HP Cloud OS Providers for available resources, relationships, and properties. Since HP Cloud OS providers are constantly adding new functionality, each provider makes available a version-specific description of objects and capabilities.

A new blank design displays at least one validation error indicating the design layout is unsaved. As you add nodes, more "Validation" on page 255 issues will display until you set required properties for the nodes and save the template.

By default, the system proposes a **Name** for the node consisting of the node type and a sequential number, e.g., Network Segment 1. This name can be changed by editing the node properties.

Connectors

Connectors are used to establish relationships between nodes, for example between a Server Group and a Volume Group.Line connectors represent one or more purposes for the connection between two nodes, even though there is a single line displayed. This design helps prevent excess visual display and allows the connector to represent multiple networking relationships.

You can add a connector and a node in a single operation by dragging a connector from a node to an empty tile. There you will be presented with a list of valid nodes for connection. You can also select a node and drag the blue circle from either side and drop it on the canvas in position. Only valid nodes display for selection

If connector properties are required, the connector displays a validation error.

Rules for node and connector layout

The system validates the following rules as you create a design:

- You can only set node properties in the **Editor** if you selected a Resource Pool during design creation.
- Only a Router node, a Load Balancer Service node, or a Server Group node can be connected to an External Network node.
- Only a Server Group node and a Load Balancer Service node can be connected to a Network Segment node.
- Only a Network Segment node and an External Network node can be connected to a Router node.
- A Server Group node can be connected to all other nodes. A Server Group node must be connected to a Network Segment node to make it accessible to an end user after it is created in a service.
- A Volume Group node must be connected to a Server Group node to create a valid topology.

Steps to design the topology service

1. After you "Create a New Topology Design" on page 231, the **Editor** opens with a blank canvas.
2. Left-click a tile to add the first node.
3. Select a topology node type from the list, which populates according to the **Cloud Profile** selected during design creation. As you hover over a node, a tool tip displays.

   Possible node options are:

Icon	Node Name	Description
	External Network *(available only with Grizzly)*	A logical representation of a public network.
	Load Balancer	A logical representation of a network load balancer that is configured on a virtual machine.

Icon	Node Name	Description
	Network Segment	A logical representation of a network or security group definition.
	Router *(available only with Grizzly)*	A logical representation of a network router.
	Server Group	A logical representation of a single server or multiple servers with the same configuration.
	Volume Group	A logical representation of a storage device.

4. The node icon and name display on the canvas in the selected tile and node Properties display in the right panel. **NOTE**: The red exclamation point on the node and the red text in the Properties panel indicate that Properties need to be updated before saving. These missing properties are flagged as invalid and are tracked in the **Validation** tab.

5. With the node selected (blue highlighting), drag one of the blue circles on either side of the node and drop. You are presented with a list of valid nodes.

6. Make your selection from the list of available nodes.

7. Repeat steps 5 and 6 to design your template.

To set properties

Properties set here become the default configuration for the design.

1. Select a node. It displays with blue highlighting. Properties that require updating display as (unset) in the right panel and there is a red prompt to complete the field.

2. Node properties are indicated below. Check the **Modifiable** box to indicate the property can be modified by a user if the design is used to create a service offering and published to a catalog.

Node Name	Node Properties	Description
External Network	Name*	By default, the system proposes a name with a sequential number for each external network segment added to the design, e.g., External Network Segment 1, External Network Segment 2. Replace this name, if needed, to meet your business needs.
	External Network* (Modifiable) *	External (public) networks that are defined in HP Cloud OS.
Load Balancer	Name*	Name of the load balancer.

<table>
<tr><th>Node Name</th><th>Node Properties</th><th>Description</th></tr>
<tr><td></td><td>Service*</td><td>Depending on the isolation and resource constraints, choose one of the following options:

• Use existing service - Use the existing resource pool's Load Balancer service if one was defined during creation (using Graffiti).

• Create new service by entering the following information:

<table>
<tr><td>Name*</td><td>Name of the load balancing service.</td></tr>
<tr><td>Service</td><td></td></tr>
<tr><td>Resource Pool service</td><td>A pool of resources associated with the resource provider when the Resource Pool was created through Graffiti.</td></tr>
<tr><td>Instance Name Prefix</td><td>A unique prefix to the name of the host you are creating that provides useful identification and avoids duplication.</td></tr>
<tr><td>Key Name</td><td>Select the keypair to be used for this instance. Keypairs are SSH security keys that provide authentication and allow you to exchange traffic securely within a VM.</td></tr>
</table></td></tr>
<tr><td>Network Segment</td><td>Name*</td><td>By default, the system proposes a name with a sequential number for each network segment added to the design, e.g., Network Segment 1, Network Segment 2. Replace this name, if needed, to meet your business needs.</td></tr>
<tr><td></td><td>Type* (Modifiable)</td><td>Currently the only type of network is Subnet, which indicates a network that may be connected to zero or more subnets.</td></tr>
<tr><td></td><td>Network* (Modifiable)</td><td>Available private networks defined in HP Cloud OS.</td></tr>
</table>

<table>
<tr><th>Node Name</th><th>Node Properties</th><th>Description</th></tr>
<tr><td></td><td>Select a Subnet*</td><td>Select:
• Existing subnet - subnets defined in HP Cloud OS
• Create a subnet - if selected, you are prompted to enter:
<table>
<tr><td>Subnet Name</td><td></td></tr>
<tr><td>Subnet Description</td><td></td></tr>
<tr><td>IP Version</td><td>Version of IP protocol to be used.</td></tr>
<tr><td>Mask Size</td><td></td></tr>
<tr><td>Enable DHCP</td><td>Yes or No.</td></tr>
<tr><td>DNS Servers</td><td>Hostname or IP of DNA Server.</td></tr>
<tr><td>Disable Gateway</td><td></td></tr>
</table></td></tr>
<tr><td>Router</td><td>Name*</td><td>By default, the system proposes a name with a sequential number for each router added to the design, e.g., Router 1, Router 2. Replace this name, if needed, to meet your business needs.</td></tr>
<tr><td></td><td>Router* (Modifiable)</td><td>• Select:
▪ Existing Router - routers that are defined in HP Cloud OS.
▪ Create new router - Enter the Router Name.</td></tr>
<tr><td>Server Group</td><td>Name*</td><td>By default, the system proposes a name with a sequential number for each server group added to the design, e.g., Server Group 1, Server Group 2. Replace this name, if needed, to meet your business needs.</td></tr>
<tr><td></td><td>Instance Name Prefix* (Modifiable)</td><td>A prefix to the name of the host you are creating.</td></tr>
</table>

Node Name	Node Properties	Description
	Number of Instances	Controls the minimum and maximum number of servers that can be used in the server group. To create a single server Server Group, specify 1 for both values. For a Server Group where the maximum number of servers is greater than the minimum, the user is allowed to add additional servers in the future up to the maximum.
	Image (Modifiable)	The launchable image used to create the server group. **Image** is only available if a Resource Pool was selected during design creation. To add a Resource Pool to the design, click the **Edit Design Properties** button.
	Machine Flavor* (Modifiable)	A flavor describes the machine configuration size (amount of memory, number of CPUs, and ephemeral disk space available) used to create new VMs. **Machine Flavor** is only available if a Resource Pool was selected during design creation. To add a Resource Pool to the design, click the **Edit Design Properties** button.
	Key Name (Modifiable)	Select the keypair to be used for this instance. Keypairs are the SSH credentials required to login to a server. To be able to use a keypair for accessing an instance, the user must have the private key. **Key Name** is only available if a **Resource Pool** was selected during design creation.
	Pre-create Callout	The Universally Unique Identifier (UUID) of an Operations Orchestration flow that is to be called before the object is created. An Operations Orchestration flow can read and write provider property values during service provisioning.
	Post-create Callout	The UUID of an Operations Orchestration flow that is to be called after the object is created.An Operations Orchestration flow can read and write provider property values during service provisioning.
Volume Group	Name*	By default, the system proposes a name with a sequential number for each volume group added to the design, e.g., Volume Group 1, Volume Group 2. Replace this name, if needed, to meet your business needs.

<table>
<tr><th>Node Name</th><th>Node Properties</th><th>Description</th></tr>
<tr><td></td><td>Volume*</td><td>Identifies the disc storage volume allocated to the group.

Options:

• Use Existing Volume - enter the Volume Reference and indicate if it is Modifiable.

• Create a volume - you are prompted to enter:
<table>
<tr><td>Name*</td><td>By default, the system proposes a name with a sequential number for each volume group added to the design, e.g., Volume Group 1, Volume Group 2. Replace this name, if needed, to meet your business needs.</td></tr>
<tr><td>Volume*</td><td>Keep the default option Create a Volume.</td></tr>
<tr><td>Instance Name Prefix*

(Modifiable)</td><td>A prefix to the name of the volume group you are creating.</td></tr>
<tr><td>Volume Size (GB)

(Modifiable)</td><td>Enter a number representing the size of the volume in GB.</td></tr>
<tr><td>Volume Type

(Modifiable)</td><td>Available values from HP Cloud OS that identify the storage backend driver capabilities such as SATA or SSD retrieved from the Eve API. Eve is an infrastructure topology design provisioner for OpenStack-based IaaS.</td></tr>
</table></td></tr>
</table>

4. Click **Save Changes**.

To set connector properties

Connector properties are required if the connector is red.

- Click on the connector to open any properties in the right panel.

Nodes	Field(s)
Between a Volume Group and a Server Group	**Device (Modifiable)**
Between a Server Group and a Network Segment	**Security Group (Modifiable)** - select **Security Group** or **Create a Security Group**. If you select **Create a Security Group**, select **Yes** if you want an unassigned Floating IP address allocated to each server in the Server Group.

To edit the layout, see "Edit a Topology Design" below

Edit a Topology Design

After a design is created and saved, you can modify the properties of the components and change the layout of the nodes and connectors within the **Editor** tab. A selected component is indicated with blue highlighting and associated properties open in the right panel for editing.For more information on creating a design and specific properties, see "Designing the Topology Layout" on page 242.

1. From the Cloud Service Management Console dashboard, click **Designs** and then click **Topology**.
2. Within the **Browse Designs** window, select a design to edit. See "Browse Designs" on page 229 for more information on how to filter the list of designs.
3. Click on the **Editor** tab. The design displays on the canvas.

To add nodes and connectors

To add nodes and connectors, see "Steps to design the topology service" on page 243.

To rearrange the layout

You can drag and drop nodes to change the layout of the design. Connectors follow, and it is acceptable to have connectors overlapping nodes.

To edit node properties

1. Within the **Editor**, click the node to edit. The properties display in the right panel.
2. Edit the fields as necessary.
3. Click **Save**.

To edit connector properties

The only connector properties that are editable are:

- Between a Volume Group and a Server Group
- Between a Server Group and a Network Segment

1. Within the **Editor**, click the connector to edit.The properties display in the right panel.
2. Edit as necessary.
3. Click **Save**.

To delete nodes and connections

If you delete a node that has a connection, both the node and the connection are deleted. You can also delete a connector itself without deleting any nodes. Deletion cannot be undone.

In addition to using the contextual menu outlined below, you can delete using the Delete option in the toolbox.

1. Select the item on the canvas to be deleted.
2. Right-click and select **Delete Item.** They system prompts you to confirm the deletion.
3. Click **Yes** to confirm. The item is removed from the layout.

Profiles

When you create and save a topology design, the properties you set for the nodes become the default configuration for the design. Profiles provide a way to override the default configuration by allowing you to set different values for node properties such as flavors, machine images, or keypairs.Profiles create an association to a binding document. Profiles are optional and are not required in order to publish a service design. For more information, see "Publish a Design" on page 239

Profiles are validated and tracked in the **Validation** tab. The validation process checks that a profile contains all the required configuration properties, e.g., that Flavor is set for a server group node.

You can create as many profiles as needed. You can create a new profile based on an existing profile.This can save you time and effort if the profiles have similar configurations. This process copies all the nodes, connectors, and properties of the original profile into the new profile where you can then change the properties.

Once a profile is saved, it is used to create service offerings in the **Offerings** area of the Cloud Service Management Console. Profiles can be further refined within **Offerings** by changing properties and setting pricing.The offering is then published and exposed to subscribers in the Marketplace Portal.

To view profiles and details

1. From the Cloud Service Management Console dashboard, click **Designs** and then click **Topology**.
2. From **Browse Designs**, select the design for which you want to view profiles.
3. Click the **Profiles** tab. A list of existing profiles displays.
4. Select a profile. The profile opens in the **Overview** tab, showing the **Name**, **Description**, **Changed Properties** and a visual representation of the topology design. **NOTE**: The linked path at the top of this window allows you to move back as needed.

See related topics:

"Create a Profile" on the next page

"Edit Profile Properties" on page 254

"Delete a Profile" on page 255

View Profile Details

For more information about profiles, see "Profiles" on the previous page.

To view profiles and details

1. From the Cloud Service Management Console dashboard, click **Designs** and then click **Topology**.
2. From Browse Designs, select the design for which you want to view Profiles.
3. Click the **Profiles** tab. A list of existing profiles displays.
4. Select a profile. The Profile opens in the **Overview** tab, showing the topology design diagram details. **NOTE**: The linked path at the top of this window allows you to move back as needed.

See related topics:

"Edit Profile Properties" on the facing page

"Create a Profile" below

"Delete a Profile" on page 255

Create a Profile

For more information about Profiles, see "Profiles" on the previous page.

To create a new profile

1. From the Cloud Service Management Console dashboard, click **Designs** and then click **Topology**.
2. From **Browse Designs**, select the design for which you want to create a profile.
3. Click the **Profiles** tab, then click **Create**.
4. Enter the following information:

Based on	Select an existing profile on which to base this new profile. This could save you some configuration time and effort as this option populates the new profile with the existing profile properties. If this option is left (unset) you will be creating a profile based on the original design configuration.
Name *(Required)*	Enter a unique, descriptive name for the profile. The name can include spaces.
Description	Enter a description of the profile.

5. Click **OK**. The profile opens in the **Editor** tab, with the title bar at the top of the window displaying the path to the Profile Detail of the current design.
6. Within the **Editor**, select a node or connector to reconfigure. The properties panel opens on the right allowing you to update.
7. Continue selecting nodes or connectors and updating properties as needed for your new configuration profile.
8. Click **Save**. To return to the **Profiles** tab, click the design name in the title bar path.

Edit Profile Properties

For more information about Profiles, see "Profiles" on page 252.

You can only edit the **Name** and **Description** of a Profile. If you need to change the configuration of a profile, create a new profile. See "Create a Profile" on the previous page.

To edit a profile

1. From the Cloud Service Management Console dashboard, click **Designs** and then click **Topology**.
2. From Browse Designs, select the design with the profile you want to edit.
3. Click the **Profiles** tab.
4. Select the profile to edit. The profile opens in the **Overview** tab, showing details on the left and the topology design layout on the right. **NOTE**: The linked path in the title bar of this window allows you to move back as needed.

5. Click **Edit**.
6. Edit the **Name** or **Description** as needed.
7. Click **OK**.
8. Click **Save.**
9. Select a destination in the title bar path to move back as desired.

Delete a Profile

For more information about Profiles, see "Profiles" on page 252.

You should not delete a profile that has been used to create a service offering, as provisioning will fail. Deleting cannot be undone.

1. From the Cloud Service Management Console dashboard, click **Designs** and then click **Topology**.
2. From **Browse Designs**, select the design with the profile you want to delete.
3. Click the **Profiles** tab.
4. Select the profile to delete and then click **Delete**. A confirmation dialog box displays.
5. Click **Yes**. The profile is deleted.

Validation

Validation is a continuing process during design creation, configuration, and editing.Topology Designs provides a validation log where you can view details about all design issues in one place. In addition to this log, you will see red validation flags as you create a design in the **Editor** and create **Profiles**. The validation process checks that a Profile contains all the required configuration properties, e.g., that Flavor is set for a server group node.

Within the **Editor**, the following artifacts are validated:

- Document properties
- Node properties

- Connector properties

As part of the validation process, any new node that is added in the Editor immediately displays with an Unsaved icon ( ) and a list of specific property errors highlighted in the right panel. Within the Validation tab, you can click on the artifact name to be linked back to the source of the error.

The **Validation** tab can be accessed at any time during the design process.

To view validation errors

1. From the Cloud Service Management Console dashboard, click **Designs** and then click **Topology**.
2. From Browse Designs, click the design to view.
3. Click on the **Validation** tab. Note that the tab itself displays the number of current issues.
4. Within this window, a table displays with:

- the icon associated with a component
- the name of the component, which is a direct link to the component so you can update
- a brief description of issues with the component

5. Clicking a linked validation item moves you to the source of the issue.

Offerings

Use the Offerings area of the Cloud Service Management Console to configure and manage service offerings. You create a service offering from a sequenced or topology service design when you are ready to expose the design to subscribers in a catalog in the Marketplace Portal.Service designs are the recipes for automating the cloud, and each design includes service components that define what is provisioned automatically.

A sequenced design is a hierarchical component layout with sequential lifecycle execution based on the design layout. Sequenced designs use components to group multiple automation providers within a single entity. Topology designs are a free-form component layout where connection relationships implicitly define the service fulfillment lifecycle. Each topology design binds to a single provider for fulfillment automation.

Within Offerings, you can refine the subscriber options configured in the service design by setting default property values and/or option selections and hiding properties, options, or option sets you do not wish to expose to subscribers. Pricing is configured on a service offering and supports initial, recurring, and option-specific pricing. You can also attach documents to a service offering (e.g., service level agreements, terms and conditions) and screenshots, which are images and captions that provide the user with a visual representation of the offering in the Marketplace Portal.

Once configured and saved, service offerings are published into one or more catalogs and available to subscribers in the Marketplace Portal

On the main screen of the Offerings tab, you can browse service offerings and also:

- "Manage Offering Tags" on page 261
- "Create a Service Offering" on the facing page
- "Import a Service Offering" on page 259

See "Service Offering Tabs" on page 263 for information about how to view configurations or add refinements before publishing a service offering:

Browse Service Offerings

For more information about service offerings, see "Offerings" above.

To browse service offerings

1. From the Cloud Service Management Console dashboard, click **Offerings**.

2. By default, all existing service offerings display alphabetically in a tile view ( ) with their associated image and name. Click ( ) to view the offerings in a list rather than tiles.

3. Using the left navigation panel, you can select offerings by tag. Tags are color-coded labels you can use to provide a structure for organizing and grouping associated service offerings.See "Manage Offering Tags" on page 261 for more information.

4. Use the search icon ( ) to filter the list of service offerings based on a keyword search of service offering names and descriptions. Backspace to clear the filter.

5. Click on a service offering to view details or edit.

Create a Service Offering

For more information about service offerings and the service designs that are used to create them, see "Offerings" on the previous page.

To create a service offering

1. From the Cloud Service Management Console dashboard, click **Offerings**.

1. From the Offerings list, click **Create**.

2. Enter the following information:

   a. **Service Design** (required)- Click the ellipse icon ( ) to select a sequenced or topology service design to use as the basis for this offering.Use **Search** to filter the list and then click the **Select** button.

   b. Enter a unique **Display Name** for the offering (required).

   c. Enter a **Description**.

   d. Click the **Change Image** button to change the default image associated with this offering. The **Select Image** dialog box provides an extensive library of images to choose from, or

you can add your own image by clicking the **Upload** button in the Image picker dialog box. Recommended image size is 256 x 256 with a maximum file size of 1 MB.

e. Click **Select Tags** to add or edit a tag. For more information about tags, see "Manage Offering Tags" on page 261.

3. Click the **Create** button. The Offerings list re-displays with your new service offering.

To edit an offering

See "Edit a Service Offering" on page 265.

To view details and configure an offering

Configure the offering by providing additional information in the following areas:

- "Overview" on page 264
- "Options" on page 268
- "Pricing" on page 272
- "Documents" on page 273
- "Screenshots" on page 274

Import a Service Offering

For more information about service offerings, see "Offerings" on page 257.

Import process for service offerings

The import process imports archives of service offerings and their supported artifacts. Supported artifacts for service offerings include associated service designs and resource offerings.

Prerequisites for importing an offering based on a topology design

If the imported offering is based on a an HP Cloud OS topology design, there are several prerequisite steps:

1. From the Cloud Service Management Console dashboard, click the **Resources** tab, specify an HP Cloud OS Provider.

2. Add the following two properties:
   a. Boolean property: defaultTopologyImporter=true

   b. String property: resourcePoolName=<resource_pool_name>

Update process for service offerings

If the **Update** option is selected during the import process, identical artifacts that exist on the target system are updated (overwritten) with the changes from the archive. Artifacts are created if they do not exist on the target system.

Update preserving original process for service offerings

If the **Preserve Originals** check box is selected along with the **Update** option during the import process, a backup copy of the existing offerings and designs will be saved with "Superseded" and date added to that respective artifact's **Display Name** and **Description**.

To import a service offering

1. From the HP Cloud Service Management Console dashboard, click **Offerings**.

2. Click the **Import** button.

3. Select or specify the **Archive File** (.zip file), that contains the service offering you want to import. Archive filenames for service offerings begin with `SERVICE_OFFERING_`. Click the ellipse icon (...) to search for the archive file.

4. Select an **Option**:

   a. **Import** - imports new service offerings; does not update existing service offerings.

   b. **Update** - imports new service offerings and updates (overwrites) existing service offerings. Check **Preserve Originals** to create backup copies of the original items, appending "Superseded on" and the date to the artifact display names and descriptions.

5. Click **Preview** to view a report of missing dependencies or conditions that would cause the import to fail. This feature is useful as it does not alter the database or actually initiate the importing of the archive content.

6. Click **Import**.

7. Click **View Detailed Report**. Click the link to the HTML form to view the status of the import, which includes details about matching and reusing existing artifacts, importing new artifacts, or any missing dependencies that might cause the import to fail.

8. Click **Yes**. If the service offering already exists, redo the import in **Update** mode.If the system is missing some process definitions, then the service design within the service offering may fail to import.

A successfully imported service offering appears in the Offerings list. **NOTE**: You may have to click **All** to view the newly imported offering if you have a tag category selected.

Manage Offering Tags

Tags are a color-coded label and an image you can use to provide a structure for organizing and grouping associated service offerings. Once tags have been created, they can be assigned during creation or editing of a service offering by clicking **Select Tags**.

To manage offering tags

1. From the Cloud Service Management Console dashboard, click **Offerings**.

2. From the Offerings list click  .

From the Manage Offering Tags dialog box, you can:

- "Create a Tag" below
- "Edit a Tag" on the facing page
- "Delete a Tag" on page 263

Once tags are created, you can "Associate a Tag to an Offering" on page 263

Create a Tag

For more information about tags, see "Manage Offering Tags" above. Once created, tags can be associated to a particular service offering.

To create a tag

1. From the Cloud Service Management Console dashboard, click **Offerings**.
2. In the left panel of the Offerings list, click .
3. In the **Manage Offering Tags** dialog box, click the Add icon (+).
4. Provide the following information:
   a. **Display Name (required)** - The name you provide for this tag.
   b. **Description** - The description you provide for this tag.
   c. **Image** - An image that displays for the tag. Click **Change Image**. Choose the image you want, and click **Select**. Click **Upload** to add your own image. Supported file extensions include `.jpg`, `.jpeg`, `.gif`, and `.png`. The recommended image size is 256 by 256 pixels, and the image will be scaled to the appropriate size. Click **Refresh**, choose the image you want, and click **Select**. Close this window.
   d. **Color** - Select a color that displays for the tag.
5. Click **Create**.
6. Click **Done**.

Edit a Tag

For more information about tags, see "Manage Offering Tags" on the previous page.

To edit a tag

1. From the Cloud Service Management Console dashboard, click **Offerings**.
2. In the left panel of the Offerings list, click .
3. In the **Manage Offering Tags** dialog box, select the tag you want to edit.
1. Click the Edit icon ( ).
2. Update the fields as necessary. For information about the specific fields, see "Create a Tag"

on the previous page.

3. Click **Save**.

Associate a Tag to an Offering

For more information about tags, see "Manage Offering Tags" on page 261.

Tags can be optionally associated to an offering during the creation or editing process. See "Create a Service Offering" on page 258 or "Edit a Service Offering" on page 265.

Delete a Tag

For more information about tags, see "Manage Offering Tags" on page 261.

If you attempt to delete a tag that is currently associated with service offering(s), the system will prompt you to confirm deletion. Deleting a tag removes it from any service offerings to which it is associated.

To delete a tag

1. From the Cloud Service Management Console dashboard, click **Offerings**.
2. In the left panel of the Offerings list, click .
3. In the **Manage Offering Tags** dialog box, select the tag you want to delete.
4. Click the Delete icon ( ).The system prompts you to confirm deletion.
5. Click **Yes** to confirm the deletion.
6. Click **Done.**

Service Offering Tabs

Use the Offerings area of the Cloud Service Management Console to configure and manage service offerings.

See the following topics for information about how to view configurations or add refinements before publishing a service offering:

- "Overview" below
- "Options" on page 268
- "Pricing" on page 272
- "Documents" on page 273
- "Screenshots" on page 274

Overview

For more information about service offerings, see "Offerings" on page 257.

To view service offering details

1. From the Cloud Service Management Console dashboard, click **Offerings**.
2. From the Offerings list, click on the offering to view. The offering opens in the **Overview** tab with a view of the following information:
   - **Display Name** - The name for the service offering.
   - **Description** - The description of the offering.
   - **Selected Service Design** - The name of the service design (sequenced or topology design) associated with this offering.
   - **Image**- a visual preview of the topology design.
   - **Tags** - Displays any tags associated with the offering.

The following options are available from the service offering **Overview** details page:

- "Edit a Service Offering" on the next page
- "Publish a Service Offering" on the next page
- "Export a Service Offering" on page 267
- "Delete a Service Offering" on page 267

Edit a Service Offering

For more information about service offerings, see "Offerings" on page 257.

You can edit all attributes of a saved service offering except the service design (sequenced or topology) that was associated during creation.

To edit a service offering

1. From the Cloud Service Management Console dashboard, click **Offerings**.
2. From the list of offerings, select the one you want to edit. The offering opens in the **Overview** tab.
3. Click the **Edit** button.
4. Update these fields as necessary:
   a. **Display Name**
   b. **Description**
   c. **Change Image** - Click the **Change Image** button to change the default image associated with this offering. The Select Image dialog box provides an extensive library of images to choose from, or you can add your own image by clicking the **Upload** button in the Image picker dialog box. Recommended image size is 256 x 256 with a maximum file size of 1 MB.
   d. Click **Select Tags** to add or edit a tag. For more information about tags, see "Manage Offering Tags" on page 261.
5. Click **Save**.

Publish a Service Offering

For more information about service offerings, see "Offerings" on page 257.

Service offerings are published into one or more catalogs. Catalogs are organization-specific collections of service offerings. All offerings are published into the Global Shared Catalog and into the default catalog of the organization into which you are logged in. Additional catalogs can be created and exposed to one or more groups within an organization according to business needs.

Within a catalog, service offering categories reflect logical groupings of related services into a context that is intuitive and easily navigable for a subscriber.

Approval Policy Exceptions

As a final step before publishing, you have the option to change the approval policy for the offering and manage approval actions related to the associated service design.The **Manage Approval Actions** link is used to select actions for the selected approval. At a minimum, **Order**, **Modify**, and **Cancel** are available action options. Other actions depend on whether the associated service design is a sequenced or topology design. For sequenced designs, you will see all actions which are consumer visible contained in all design component lifecycles or lifecycle associated with the component.For topology designs, you will see all actions offered by HP Cloud OS for components in the design.

To publish a service offering

1. From the Cloud Service Management Console dashboard, click **Offerings**.
2. From the offerings list, select the offering to publish.The offering opens in the **Overview** tab.
3. Click the **Publish** button.
4. A list of available catalogs displays on the left. Select a catalog into which you want to publish the offering or click in the catalog **Search** field to filter the list.
5. Select a Category within the catalog by clicking the drop-down list in the **In Category** field. Categories are filtered according to your catalog selection. If you have already published this service offering into a particular category, that category will not be available for selection.
6. You can override the default approval policy process for this offering by making a selection in the **Approval Policy** field. **NOTE**: Changing the approval policy here within this service offering does not change the default catalog approval policy.
7. Click the **Manage Action Approvals** link to select or modify the actions related to the approval policy. Click **Done**.
8. Click **Done**.
9. Click the **Publish** button. If successful, a confirmation message displays that the offering was published into the specified catalog.
10. Click **Close**.
11. The offering is now available in the Marketplace Portal by selecting **Browse Catalogs**.

To unpublish a service offering

If you want to change the attributes of a published service offering, e.g.,documents, options, screenshots, or change properties or profiles of the topology design itself, you can unpublish the service offering by going to the catalog. After updating, you could re-publish the service offering.

Delete a Service Offering

For more information about service offerings, see "Offerings" on page 257.

You cannot delete an offering if a new subscription request for that offering is Pending or has been published.

To delete a service offering

1. From the Cloud Service Management Console dashboard, click **Offerings**.
2. From the list of offerings, click on the one you want to delete. The offering opens in the **Overview** tab.
3. Click **Delete**.
4. Click **Yes** to confirm deletion.

Export a Service Offering

For more information about service offerings, see "Offerings" on page 257.

Export process for service offerings

Exporting a service offering creates a content archive (.zip) file. The content archive contains XML documents for the service offering you are exporting, as well as associated artifacts, icons for customizing the artifacts, and the Manifest XML document which contains meta-information about the archive files.

To export a service offering

1. From the Cloud Service Management Console dashboard, click **Offerings**.
2. From the offering list, select the service offering to export. The **Overview** tab opens displaying offering details.
1. Click the **Export** button.
2. **Save** the exported service offering, if required by your browser.

When you export a service offering, the offering and all associated service designs, and resource offerings are packaged in an archive file whose name is:

```
SERVICE_OFFERING_<service_offering_display_name>_<service_offering_id>.zip
```

The zip file will be saved in the normal location for downloads for that particular browser.

Options

For more information about service offerings, see "Offerings" on page 257.

The **Options** tab within Offerings provides a way to refine the subscriber options configured in the sequenced or topology service design by setting property values and/or option selections and hiding properties, options, option sets, or Profiles you do not wish to expose to subscribers in the Marketplace Portal.

To edit service offering options

1. From the Cloud Service Management Console dashboard, click **Offerings**.
2. Select the offering from the Offerings list. See "Browse Service Offerings" on page 257 for more information on how to filter the list of offerings. The offering opens in the **Overview** tab.
3. Click the **Options** tab to display options for the selected offering.Options vary depending on whether a sequenced or topology service design was used to create the offering. See "" on page 271 or "To configure options for a sequenced design" on the next page.

To use option controls

The following table defines controls for an offering based on a sequenced design with option sets, options, and properties. If the offering is based on a topology design, replace any reference to an

option set or options below with "Profile."

Hide/Show Properties	Click this link to show or hide properties within an option set.
	Collapse the option set and options.
	Expand the option set and options.
	Show or hide an option set, option, or property; determines visibility in the Marketplace Portal.
	Lock or unlock an option set to disallow or allow the subscriber to modify the default option selections within an option set. When an option set or property is locked, all options within the option set are also locked.
	Edit the **Name**, **Description**, or **Property**.
	Move the option down within an option set.
	Move the option up within an option set.
	Drag and drop the option within an option set.
	Collapse the entire option set, including options and properties

To configure options for a sequenced design

A sequenced design includes service components created from component types or component templates that define what is provisioned automatically. When creating a sequenced design you define a hierarchy of option sets and options. When creating an option set, you add options, one of which will be set and becomes the default option. You can create properties on either an entire option set or on a specific option within the set. When you create a property on the entire option set, the property is added to each option within the set.

If the associated sequenced design was set to **Enable Multi-Select** during creation, you can choose multiple options related to an option set and its properties.

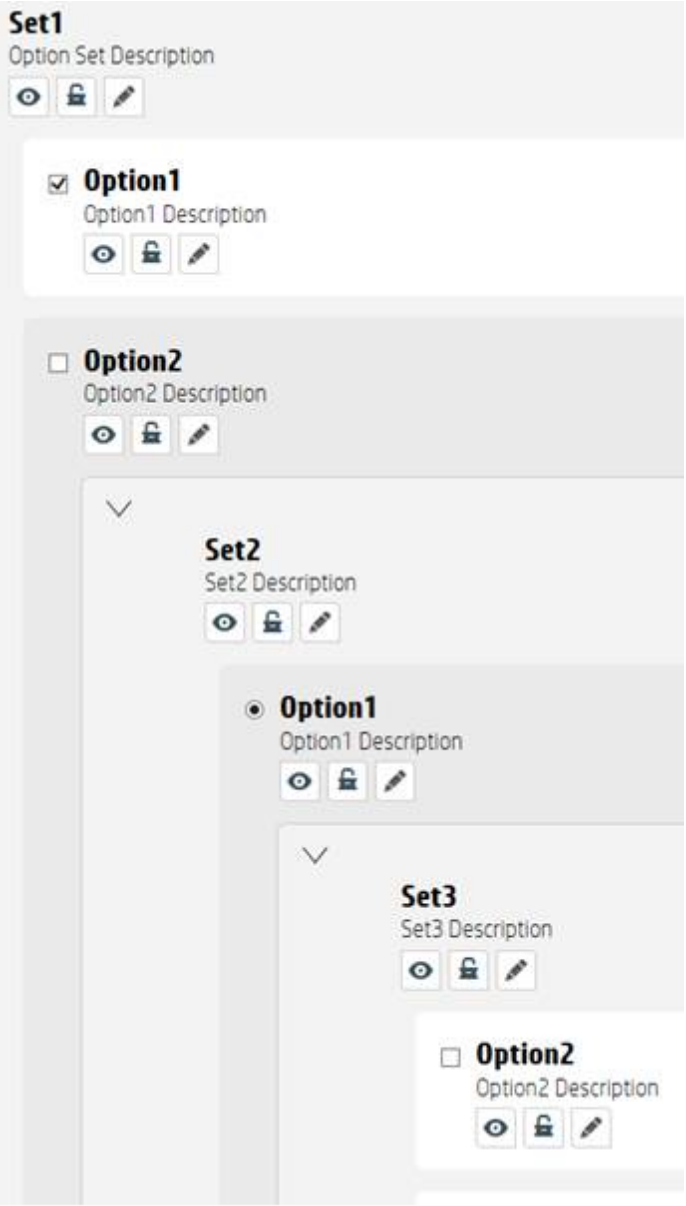
Conditions for Locking/Unlocking an Offering with a Sequenced Design

User Action	Result
Locks or Unlocks any property.	An independent action that does not affect any option sets or options.

User Action	Result
Locks at the option set level and saves.	All options in this option set are locked *except* any sub-option sets found under the option set.
Locks at the option set level and then Unlocks just a single option underneath.	The lock at the option set level is removed. Any other options at the same level remain locked.
Locks a single option.	Has no effect on any option sets or other options.

Sequenced design option set hierarchy:

In this example, properties are hidden.



To configure options for a topology design

When you create and save a topology design, the properties you set for the nodes become the default configuration for the design. You then have the option to create **Profiles** for a topology design. **Profiles** are similar to option sets for a sequenced design. They provide a way to override the default configuration of a design by allowing you to set different values for node properties such as flavors, machine images, or keypairs. Profiles create an association to a binding document.

When a topology design is used to create an offering, the **Options** tab indicates if there are any **Profiles** to configure. If there are none, you are setting options for the original design.

Topology design profiles hierarchy:

Profiles
All available profiles of the design.

- **No profile selected -** (you are viewing and modifying properties of the service design itself)
- **Profile Name**

  Profile Description

  Properties - Properties visible here were checked as **Modifiable** during topology design creation.

Pricing

For more information about service offerings, see "Offerings" on page 257.

You can set pricing for the following:

- The base, initial configuration of a service offering, without additional service options.
- Each service option in the service offering. You can also set pricing for service options that are not currently visible (as configured in the **Options** area for the service offering). For more information, see "Options" on page 268.
- A recurring period and price for a continuing subscription (for example, each week or each month).

As you enter base prices and option pricing, the **Selected Options** and **Selected Totals** panel on the right updates simultaneously. The pricing entry panel on the left is independent and allows scrolling; the Totals panel is fixed.

To configure pricing for a service offering

1. From the Cloud Service Management Console dashboard, click **Offerings**.
2. Select the offering from the Offerings list. See "Browse Service Offerings" on page 257 for more information on how to filter the list of offerings. The offering opens in the **Overview** tab.
3. Click the **Pricing** tab and enter or update the following pricing information:

Service Offering Pricing

Item	Description
Base Initial Price	The base price for the service offering, excluding the price of all selected options.
Base Recurring Price	The price charged for each recurring period.
Currency	The desired currency for the service offering.
Recurring Period	The desired recurring period for the service offering pricing, which indicates how often the recurring price is charged.

Selected Options (if applicable)

- Total Initial
- Total Recurring

Selected Totals

- Initial with Options
- Recurring with Options

4. Click **Save**.

Documents

You can attach documents of any type, such as service level agreements or terms and conditions, to service offerings. File size per document should not exceed 15 MB, total size of all documents attached cannot exceed 100 MB. You can add multiple documents at one time

Documents checked as **Visible** are exposed to users in the Marketplace Portal.

To attach a document to a service offering

1. From the HP Cloud Service Management Console dashboard, click **Offerings**.
2. Select the offering to which you want to attach document(s).
3. Click the **Documents** tab. The Service Offering Documentation window opens.
4. Click **Add Document.**
5. Select the document(s) or drag and drop documents onto the **Add Document** tile to associate it to the offering. The tile and paperclip image are replaced with the document image and the file name as a caption.
6. Once a document tile is displayed, you have the following options:
   a. **Visiblility** - click if you want this document visible to users in the Marketplace Portal
   b. **Delete** - click to delete the document. Click **Yes** when prompted for confirmation.
   c. **Edit Document Name** - click to edit the original document name. The file name extension can be removed.
7. Repeat steps 4-6 as needed.
8. If you add multiple documents, you can rearrange the order by dragging and dropping. The **Reset** button can be used to revert back to any unsaved edits (such as a file name change) or to completely reset the form and clear out all unsaved documents.
9. Click **Save**.

Screenshots

Screenshots are images and captions associated with a service offering which provide visual representations of the offering's views exposed in the Marketplace Portal. The caption defaults to the associated image name, but can be edited. You can add multiple screenshots at one time.

File size per image should not exceed 15 MB, total size of all images attached cannot exceed 100 MB. Images must be in JPG or 24-bit PNG format with a maximum size of 5000 x 5000 pixels.

To add a screenshot to an offering

1. From the Cloud Service Management Console dashboard, click **Offerings**.
2. Select the offering to which you want to attach a screenshot.
3. Click the **Screenshots** tab. The Service Offering Screenshots window opens.
4. Click **Add Screenshot**.
5. Select the screenshot or drag and drop to associate it to the offering. A tile displays showing the screenshot image with the image name as a caption.
6. Once a screenshot tile is displayed, you have the following options:
   a. **Visiblility** - click if you want this screenshot visible to users in the Marketplace Portal
   b. **Delete** - click to delete the screenshot. Click **Yes** when prompted for confirmation.
   c. **Edit Screenshot Name** - click to edit the original image name. The file name extension can be removed.
7. Repeat steps 4-6 as needed.
8. If you add multiple screenshots, you can rearrange the order by dragging and dropping. Use **Reset** to revert back to any unsaved edits (such as an image name change) or to completely reset the form and clear out all unsaved images.
9. Click the **Save** button.

Catalogs

Use the **Catalogs** area of the Cloud Service Management Console to manage service catalogs. These service catalogs allow you to publish service offerings to the Marketplace Portal. On the main screen, you can view the total number of service catalogs in the upper left corner.

Catalogs and Organizations

When a new organization is created in the **Organizations** area of the Cloud Service Management Console, a corresponding default service catalog is created automatically in the **Catalogs** area. The name of the default service catalog is the organization name followed by *Catalog*. For example, an organization named *Acme* would have a default service catalog named *Acme Catalog*. The default service catalog initially contains a list of categories and has no published service offerings.

You can start using the **Catalogs** area by configuring the automatically created default catalog, or you can manually create a new catalog and associate it with an organization. Multiple catalogs can be associated with the same organization. For more information about organizations, see the topic "Organizations" in the Organizations Help.

The Global Shared Catalog

The Cloud Service Management Console contains a single, global catalog, and any changes and additions made to the global catalog will be visible in every organization's Marketplace Portal. The global catalog does not contain **Access Control** and **Approval Policies**, and the global catalog cannot be deleted.

Catalogs in the Marketplace Portal

The Marketplace Portal displays a catalog of service offerings. The catalog includes all the service offerings in every service catalog that is associated with an organization. For example, you may have an organization named *Acme*, which has service catalogs named *Acme Catalog* (the default service catalog) and *Infrastructure Catalog* (a manually created catalog). In the Marketplace Portal for the *Acme* organization, the **Browse Catalog** tile will display every service offering in the *Acme Catalog*, *Infrastructure Catalog*, and *Global Shared Catalog*. The service offerings appear to a subscriber as if they all belong to a single catalog, but the offerings may be configured in different service catalogs in the Cloud Service Management Console.

Service Offerings

Service offerings are created in the **Offerings** area of the Cloud Service Management Console. You create a service offering from a service design when you are ready to expose the design to subscribers in the Marketplace Portal. In the service offering you can refine the subscriber options configured in the service design by setting default property values and/or option selections and hiding properties, options, or option sets you do not wish to expose to subscribers. Pricing is configured on a service offering and supports initial, recurring, and option-specific pricing. Service offerings also support attached documents, screenshots, and a configurable image.

Create a Service Catalog

For more information about service catalogs, see "Catalogs" on the previous page.

To create a service catalog

1. In the left-navigation frame, click the **Create Catalog** button.
2. Provide the following information:
   a. **Name** - The name you want for the service catalog.
   b. **Organization** - The organization this service catalog will be associated with.
3. Configure the catalog by providing additional information in the following areas:
   - "General Information" on page 281
   - "Access Control" on page 282
   - "Approval Policies" on page 283
   - "Categories" on page 288
   - "Published Offerings" on page 289
   - "Resource Environments" on page 290

Delete a Service Catalog

For more information about service catalogs, see "Catalogs" on the previous page.

You cannot delete a service catalog that contains published service offerings, has subscriptions, or has approved and still in progress service requests. When you delete a service catalog, service requests that appear in the Marketplace Portal in a *Pending* or *Denied* state are canceled.

To delete a service catalog

1. In the left-navigation frame, click the service catalog you want to delete.
2. In the service catalog's navigation frame, select **General Information**.
3. Click **Delete**.
4. Click **Yes** to confirm deletion.

Note: If the **Delete** button is disabled you need to delete all published offerings before you can continue

Import and Export Service Catalogs

For more information about service catalogs, see "Catalogs" on page 276.

Import process for service catalogs

The import process imports archives of service catalogs and their supported artifacts. Supported artifacts for service catalogs include associated service designs, resource offerings, service offerings, and resource environments. If the service catalog already exists, the catalog is updated with any added or removed supported artifacts.

Update process for service catalogs

During the update process, identical artifacts that exist on the target system are updated (overwritten) with the changes from the archive. Artifacts are created if they do not exist on the target system.

Update preserving original process for service catalogs

This process applies to the associated artifacts, but does not apply to the catalog itself. The process imports all the artifacts present in an archive, whether they exist on the target system or not.

During this operation, if there is an artifact with the same name in the system, the name, the display name, and the description of the artifact are modified internally; the display name and the

description are appended with "Superseded on" and the date. The name, display name, and description of the artifact being imported remain intact.

Content archive for service catalogs

Exporting a service catalog creates a content archive (.zip) file. The content archive contains XML documents for the service catalog you are exporting, as well as associated artifacts, icons for customizing the artifacts, and the Manifest XML document, which contains meta-information about the archive files.

You cannot import the Global Shared Catalog into the CSA-Provider organization; however, you can import the Global Shared Catalog into a consumer organization.

To import a service catalog

1. In the left-navigation frame, click the **Import Catalog** button.
2. Select or specify the **Archive File** (.zip file) that contains the catalog you want to import. Archive filenames for catalogs begin with `CATALOG_`.
3. Select an **Option**:
   a. **Import** - If a catalog does not exist, a new one is created. If a catalog exits, it is updated with the underlying service offerings, catalog categories, and resource environments.
   b. **Update** - Updates a catalog with the underlying service offerings, catalog categories, and resource environments. Check **Preserve Originals** to create backup copies of the underlying service offerings (and associated service designs and resource offerings), and resource environments.
4. Select an **Organization** if you want to import to a different organization than the original. If this field is not specified, the import will fail if the original organization (at the time of export) does not exist.
5. Click **Preview** to see a report of prospective results for the import process, including information about the artifacts and their status.
6. Click **Import**.
7. Click **View Detailed Report** to see a summary and details of the import process, including information about the artifacts and their status.
8. Click **Yes**.

To export a service catalog

1. In the left-navigation frame, select the catalog you want to export.
2. In the **General Information** area, click the **Export** button.
3. Save the exported service catalog, if required by your browser. You may be required to enable pop-ups in your browser.

When you export a service catalog, the catalog and all associated service offerings, service designs, and resource offerings are packaged in an archive file whose name is:

```
CATALOG_<catalog_display_name>_<catalog_id>.zip
```

For more information about importing and exporting HP CSA artifacts, see the *HP CSA Content Archive Tool* document.

View a Service Catalog

For more information about service catalogs, see "Catalogs" on page 276.

To view a service catalog

1. In the left-navigation frame, click the service catalog you want to view.
2. In the service catalog's navigation frame, select **Summary** to view a summary of the service catalog. In the service catalog's navigation frame, select the following areas to view more information:

   Summary (see "Summary" on the next page)

   General Information (see "General Information" on the next page)

   Access Control (see "Access Control" on page 282)

   Approval Policy (see "Approval Policies" on page 283)

   Categories (see "Categories" on page 288)

   Published Offerings (see "Published Offerings" on page 289)

   Resource Environments (see "Resource Environments" on page 290)

Summary

For more information about service catalogs, see "Catalogs" on page 276.

View a summary of the selected service catalog's configuration. To see more information about each area see:

- "General Information" below
- "Access Control" on the facing page
- "Approval Policies" on page 283
- "Categories" on page 288
- "Published Offerings" on page 289
- "Resource Environments" on page 290

General Information

For more information about service catalogs, see "Catalogs" on page 276.

To configure general information for a service catalog

1. In the service catalog's navigation frame, select **General Information**.
2. Provide or update the following information, and click **Save**.

Item	Description
Catalog Name	The name of the service catalog.
Catalog Description	The description of the service catalog.

Item	Description
Approval Process	This is the default approval process that will be assigned to any newly published service offerings made to this catalog. If you select Active, then you must also select an **Approval Policy**. If you select **Passive**, no manual approval steps are required when the subscription request is made. This default approval process and policy can be overridden during the **Add Service Offering** step of publishing a service offering or can be changed by editing the published service offering. This field is not available for the Global Shared Catalog.
Select Approval Policy	Select an approval policy from the list. For more information, see "Approval Policies" on the next page. This field is not available for the Global Shared Catalog.
Catalog Image	An image that displays for the catalog. Click the browse icon. Choose the image you want, and click **Select**. Click **Upload Image** to add your own image. Supported file extensions include `.jpg`, `.jpeg`, `.gif`, and `.png`. The recommended image size is 256 by 256 pixels, and the image will be scaled to the appropriate size. The images are stored in the `%CSA_HOME%\jboss-as-7.1.1.Final\standalone\deployments\csa.war\images\library` folder of the HP CSA server.

See also, "Delete a Service Catalog" on page 277.

Access Control

For more information about service catalogs, see "Catalogs" on page 276.

The users who can log in to an organization's Marketplace Portal are configured in the **Organizations** area of the Cloud Service Management Console. Users in the Service Consumer role can log in to the Marketplace Portal.

You can choose whether a service catalog is visible to all authenticated users of a consumer organization (those in the Service Consumer role) or to a subset of users that belong to specific LDAP organizations or groups.

To make a service catalog visible to all authenticated users of a consumer organization, determine the LDAP groups that have been added to the Service Consumer role of the organization (in the **Organizations** area) and ensure all the same LDAP groups appear in the **Access Control** area for the service catalog. For a manually created service catalog, this action happens automatically when the catalog is created. For an organization's automatically created catalog, you must manually add these LDAP groups.

To make a service catalog visible to a subset of authenticated users of a consumer organization, configure the **Access Control** for the catalog to include only the groups of users that should be authorized to view the catalog. Keep in mind that access control for a catalog can only reduce the set of users that can view a catalog for an organization; it cannot be used to grant catalog access to users who are not in the Service Consumer role for the associated organization.

Use this **Access Control** area to assign additional LDAP groups to the catalog. For more information about LDAP groups, see the **Organizations** topic the topic "Access Control" in the Organizations Help.

To add a group

1. Click **Add DN**.
2. Do one of the following:
   - Select an existing group.
   - Add a new group by typing a group name and a group DN. This DN must be relative to the Base DN you configured in the LDAP section for this organization. If the base DN for the organization is empty, supply the full DN of the group.
3. Click **Add**.

To edit a group

1. Hover over the group you want to edit.
2. Click the **edit** icon to change a group name and a group DN, as desired.
3. Click **Update**.

To delete a group

1. Hover over the group you want to delete.
2. Click the **Delete** ( ) icon.
3. Click **Yes** to confirm the deletion.

Approval Policies

For more information about service catalogs, see "Catalogs" on page 276.

The approval process and approval policies for a catalog are configured in the **General Information** area. The **Approval Policies** area lists the approval policies that can be assigned to published service offerings. You can also select a policy in this list as the default approval policy when the catalog has been set to an **Active** approval process as selected in the **General Information** area, as described in "General Information" on page 281.

HP CSA provides out-of-the-box templates (described in the following table) for creating active approval policies.

Note the following before creating approval policies:

- When you create an approval policy, make sure that all approvers are granted access to the catalogs for which they will be approving subscription requests.
- An approval policy cannot be removed after it is created.

To add an approval policy

1. Click **Add Approval Policy**.
2. Provide the following information, and click **Create**:

Item	Description
Approval Policy Name	Provide a name for the approval policy.

Item	Description
Approval Policy Template	You cannot change the **Approval Policy Template** after an approval policy is created. Select one of the following templates for the approval policy: • **Delegated Template** - Use this template to set up third-party approvals, which are configured by designating a process definition that will be used to communicate with HP Operations Orchestration about the approval process requirements. ▪ If selected, provide the following information: ○ **Process Definition** - Select the process definition that will be used to communicate with HP Operations Orchestration. Be sure you have the latest process definitions from HP Operations Orchestration. For instructions about how to do this, see the section "Import HP Operations Orchestration Flows" in the *HP Cloud Service Automation Configuration Guide*. ○ Check **Automatic Approval**, if desired, and provide the following information: ○ **Automatic Approve/Deny** - Select one of the following replies: ○ **Approved** - Automatically approve the request when the specified Wait Time for Automatic Approval (in days) period has elapsed. ○ **Denied** - Automatically deny the request when the specified Wait Time for Automatic Approval (in days) period has elapsed. ○ **Wait Time for Automatic Approval (in days)** - Select the number of days after which, if no response is made, the automatic approval or rejection will occur. • **Named Approver Template** - Use this template to assign one or more users from the organization as approvers for all subscription requests. You can also set the number of approvals required for a subscription request to be fulfilled ▪ If selected, provide the following information: ○ **Add Approver** - Provide the LDAP user name of the approver you want to add, and click **Add Approver**. Repeat to add more approvers. ○ **Minimum Approvals** - Select the minimum number of approvals required for a subscription request to be fulfilled.

Item	Description
	◦ Check **Automatic Approval**, if desired, and provide the following information: ◦ **Automatic Approve/Deny** - Select one of the following replies: ◦ **Approved** - Automatically approve the request when the specified **Wait Time for Automatic Approval (in days)** period has elapsed. ◦ **Denied** - Automatically deny the request when the specified Wait Time for Automatic Approval (in days) period has elapsed. ◦ **Wait Time for Automatic Approval (in days)** - Select the number of days after which, if no response is made, the automatic approval or rejection will occur. • **Named Group Template** - Use this template to base approvals on an LDAP group. By default, the `csa.properties` file has the setting `csa.group.numberOfApprovers=10`, which restricts the size of the group that can be selected as a named group for approval. If you want to use groups with more members, you can change the value. However, if you select a very large group (thousands of members) you may encounter performance problems interacting with LDAP. In addition, if the minimum number of approvers that is specified when you create a named group approval policy is greater than the number of members in a group, then the minimum number of approvers will be implicitly set to the actual number of members in the group. ▪ If selected, provide the following information: ◦ **Add Group** - Select or type the DN for the LDAP group or organizational until you want to use for approvals. The members of the selected group (at the time of the request) will be set as approvers of the request. ◦ **Minimum Approvals** - Select the minimum number of approvals required for a subscription request to be fulfilled. ◦ Check **Automatic Approval**, if desired, and provide the following information: **Automatic Approve/Deny** - Select one of the following replies: ◦ **Approved** - Automatically approve the request when the specified

Item	Description
	Wait Time for Automatic Approval (in days) period has elapsed. ○ **Denied** - Automatically deny the request when the specified **Wait Time for Automatic Approval (in days)** period has elapsed. **Wait Time for Automatic Approval (in days)** - Select the number of days after which, if no response is made, the automatic approval or rejection will occur. • **User Context Template** - Use this template to base approvals on LDAP membership settings and structure, as configured in the **Organizations** area. ▪ If selected, provide the following information: ○ **Approval Levels** - Select the number of managers in the organization chain who will be asked to approve the request. For example, if you select two, the subscriber's first- and second-level manager will be required to approve the request. ○ Check **Automatic Approval**, if desired, and provide the following information: ○ **Automatic Approve/Deny** - Select one of the following replies: ○ **Approved** - Automatically approve the request when the specified **Wait Time for Automatic Approval (in days)** period has elapsed. ○ **Denied** - Automatically deny the request when the specified **Wait Time for Automatic Approval (in days)** period has elapsed. ○ **Wait Time for Automatic Approval (in days)** - Select the number of days after which, if no response is made, the automatic approval or rejection will occur.

To edit an approval policy

1. Hover over the approval policy you want to edit.
2. Click the **edit** icon.

3. Make desired changes to the fields, as described in the table above. Note that not all fields will be available for editing.

4. Click **Save**.

Categories

For more information about service catalogs, see "Catalogs" on page 276.

Categories are used to group the service offerings in a service catalog. Subscribers in the Marketplace Portal can view the category of each offering after it is published, as well as filter the list of service offerings to those in a particular category.

In the **Categories** area, you can view the list of available categories for a service catalog and see the number of offerings assigned to each category. HP CSA provides a number of out-of-the-box categories, and you can create your own.

To create a category

1. Click **Add Category**.

2. Type a name for the category.

3. Click **Create**.

To edit a category

When you use the **edit** button to rename a category, you will retain all the associated service offerings for that category.

1. Hover over the category you want to edit.

2. Click the **edit** icon, and change the name as desired.

3. Click **Update**.

To delete a category

You cannot delete a category that has offerings associated with it.

1. Hover over the category you want to delete.
2. Click the **Delete** ( ) icon.
3. Click **Yes** to confirm the deletion.

Published Offerings

For more information about service catalogs, see "Catalogs" on page 276.

When you publish a service offering, it is displayed in the Marketplace Portal in the category to which you have assigned it. By default, a service offering inherits its approval process and approval policy from the default set on the service catalog. When you publish or edit a service offering, you can create an approval process exception, which overrides the catalog approval process and policy with the one you select for the service offering.

To view the list of offerings per category

1. In the service catalog's navigation frame, select **Published Offerings**.
2. Select the category whose published service offerings you want to view.
3. View the list of published service offerings that displays.

To publish a service offering to a category

1. In the service catalog's navigation frame, select **Published Offerings**.
2. Select the category to which you want to add a service offering.
3. Click **Add Offering**.
4. Browse or search to locate the offering you want to add to the category. Click **Select**.
5. Select a category, if needed. This step is not necessary if you selected a specific category in step 1; it appears only if you selected **All Categories** in step 1.
6. If desired, configure an **Approval Policy Exception** to override the catalog's default approval process and/or approval policy. The approval process and approval policy you select for a specific service offering is an exception to the service catalog approval process and approval

policy. Your selection here does not change the catalog's default approval process and approval policy. For information about setting the approval process and approval policy for a service catalog see "General Information" on page 281.

a. Select either **Active** or **Passive**.

b. If you select **Active**, then you must also select an **Approval Policy**. If you select **Passive**, no manual steps are required for the subscription request to continue. For more information about approval policies, see "Approval Policies" on page 283.

7. Click **Add** to publish the service offering to the catalog.

To edit the approval process or approval policy for service offering

1. Hover over the service offering you want to edit.
   a. Click the **edit** icon, and change the approval process or approval policy as desired. This change will not affect existing subscription requests that use this service offering.

   b. Click **Update**.

To unpublish a service offering from a category

1. Select the category from which you want to unpublish a service offering.

2. Hover over the service offering and click the **Unpublish** ( ) icon.

3. Click **Yes** to confirm the removal of the service offering from the category.

Resource Environments

For more information about service catalogs, see "Catalogs" on page 276.

For more information about resource environments, see the topic "Environments" in the Resources Help.

You can specify one or more resource environments for a catalog. The resource environments restrict the set of resource providers that can be chosen at subscription time. When provider selection occurs during service provisioning, only providers belonging to one or more of the environments associated with the catalog will be eligible for selection. If you do not associate any environments with a service catalog, provider selection is not restricted by environments. When

associating environments with a catalog make sure that all providers necessary to deploy the service offerings in the catalog exist within at least one of the environments associated with the catalog.

Note: If you add one or more environments to a catalog that also contains offerings for topology designs, make sure the HP Cloud OS resource provider in the Resources area of the Cloud Service Management Console is associated with at least one of these environments. This is necessary to enable successful provisioning of topology designs.

To view the list of environments per catalog

1. In the service catalog's navigation frame, select **Resource Environments**.
2. View the list of resource environments for the catalog.

To add an environment to a catalog

1. In the service catalog's navigation frame, select **Resource Environments**.
2. Click **Add Environment**.
3. Select a resource environment from the list.
4. Click **Select**.

To remove an environment from a catalog

1. In the service catalog's navigation frame, select **Resource Environments**.
2. Hover over the environment you want to remove and click the **Remove** ( ) icon.
3. Click **Yes** to confirm.

Operations

Use the **Operations** area of the Cloud Service Management Console to view and manage subscriptions and service instances for all consumer organizations. A subscription originates with a subscription request, which is a request for delivery of cloud services that is initiated by the Subscriber (end user) using a service catalog in the Marketplace Portal. After a subscription request is approved, a service instance is created.

See the following related topics:

- "View User Subscriptions for an Organization" below
  - "View Subscriptions for a User" on the next page
  - "Subscription Overview" on page 296
  - "Transfer Subscriptions" on page 297
  - "View Topology for a Subscription" on page 302
  - "View Providers for a Subscription" on page 306

To use the service operations interface

The following toolbar icons and features are used in the **Operations** area:

Item	Description
	Type search text to filter using keyword-based search.

View User Subscriptions for an Organization

For more information about the **Operations** area, see "Operations" above.

To view subscriber information for an organization

1. In the left pane of the **Operations** area, select the name of the organization whose subscriber information you want to view; the subscriber information displays in the **Users** tab. Note that the list of subscribers shown is the list of users who have logged into the Marketplace Portal at least once.

2. Use the drop-down box to select an option for sorting.

3. You see the following information for each user:

Note: Only subscriptions submitted by the subscriber are included in the list of subscriptions; any subscriptions submitted for a group the subscriber belongs to (that were not submitted by the subscriber) are not included in the list. Subscriptions submitted for a group are identified by the Group ( ) icon.

Item	Description
User Name	The user name (and associated email address) that the Subscriber uses to log into the Marketplace Portal.
Subscription Summary	The number of subscriptions with the status: Active Pending Paused Canceled Expired Failed For a more detailed description of each status, see "View Subscriptions for a User" below.
Request Summary	The number of requests in the following state: Pending **Last Request Date** -The date of the most recent subscription request made by this subscriber.

View Subscriptions for a User

For more information about the **Operations** area, see "Operations" on the previous page.

For information about viewing subscription details, see "Subscription Overview" on page 296.

For information about transferring subscriptions from one subscriber to another, see "Transfer Subscriptions" on page 297.

To view all subscriptions for a user

Note: Only subscriptions submitted by the subscriber are included in the list of subscriptions; any subscriptions submitted for a group the subscriber belongs to (that were not submitted by the subscriber) are not included in the list. Subscriptions submitted for a group are identified by the Group ( ) icon.

1. In the left pane of the **Operations** area, select the name of the organization whose subscriber information you want to view.
2. Note that the list of subscribers shown in the **Users** tab is the list of users who have logged into the Marketplace Portal at least once. Select the user whose subscriptions you want to view.
3. In the top of the **Subscriptions** tab, see the user name and a subscription status summary for this user.
4. By default, the table is sorted by the **Submitted On** date. If desired, select a sort option from the drop-down list.
5. For each subscription, you see the following information:

Item	Description
Subscription Details	The subscription details include the following: • **Display Name** - The name of the subscription, as entered by the subscriber at order time. • **Service Offering Name (Service Catalog Name)** - The name of the service offering from which this subscription was created, followed by (in parentheses) the name of the service catalog from which the subscription was ordered.
Submitted On	The date the subscription was submitted by the Subscriber.
Subscription Period	The date the subscription deployment began, followed by the date the subscription ends.

Item	Description
Subscription Status	The subscription status, as described below: Active - The subscription is active. Pending - The subscription was approved but has not started for one of the following reasons: • The start date is a future date • The subscription has not yet been deployed • The subscription was modified, and the modification has been approved but has not yet completed. • An action affecting the service was requested for the service instance, and the action has not completed. Paused - The subscription has experienced an error during initial provisioning. • For a subscription to pause when a failure occurs, the Organization in which the subscription exists must be configured to pause on failures. • Subscriptions can be paused only when a failure occurs during the following lifecycle states: Initializing, Reserving, and Deploying. • When a subscription is paused, any failure substate actions are not run in HP CSA; the provisioning stops at the first action of the failed substates. • To resume the subscription provisioning, you must first fix the issues that caused the failure, and then click **Resume Provisioning**, as described in "View Topology for a Subscription" on page 302. The subscription provisioning then resumes by re-running any actions that failed and continuing with the remainder of the provisioning. • The Marketplace Portal displays paused subscriptions with a subscription status of Pending. Expired - The subscription period has expired. Canceled - The subscription has been canceled. Failed - The subscription was terminated because the deployment failed.

Item	Description
Service Instance Status	The status of the service instance created from this subscription, as described below: Online - The service instance is active. Offline - The service instance is no longer available because the subscription was canceled or expired. Transitioning - The service instance is being reserved for deployment. Reserved - The service instance has not started because the start date for the subscription is in the future. Deploying - The service instance is being deployed. Modifying - A modification or action affecting the service instance has not yet been completed. Modification Failed - A modification or action affecting the service instance failed. Failed - The service instance deployment failed. Canceling - The service instance is being canceled. Cancellation Failed - The service instance cancellation has failed. Expiring - The service instance is expiring. Expiration Failed - The service instance expiration has failed.

Subscription Overview

For more information about the **Operations** area, see "Operations" on page 292.

To see a subscription overview

1. In the left pane of the **Operations** area, select the name of the organization whose subscription overview you want to see. Note that the list of subscribers shown in the **Users** tab is the list of

users who have logged into the Marketplace Portal at least once.

2. In the **Users** tab, select the user whose subscription overview you want to see.

3. In the **Subscriptions** tab, select the subscription whose overview you want to see.

4. In the **Overview** tab, see overview information for the selected subscription. The overview provides the same information as described in "View Subscriptions for a User" on page 293.

See also, "Transfer Subscriptions" below and "Cancel Subscriptions" on the facing page.

Transfer Subscriptions

For more information about the **Operations** area, see "Operations" on page 292.

You can transfer subscriptions from one subscriber to another subscriber in the same organization, with the following restrictions:

- The subscribers you want to transfer the subscription from and to must have logged into the Marketplace Portal at least one time.
- Subscriptions with requests that are Approved but still in progress cannot be transferred. Subscriptions with requests that are Approved and have completed can be transferred.
- Subscriptions with requests that are Paused cannot be transferred.
- Subscriptions with requests that are Pending and awaiting approval can be transferred; the pending requests will be canceled.
- Subscriptions with requests in any other state can be transferred.
- The initial service request that created the subscription is transferred with the subscription; however, subsequent service requests for the subscription are not transferred.

To transfer subscriptions from one subscriber to another

1. In the left pane of the **Operations** area, select the name of the organization whose subscription you want to transfer. Note that the list of subscribers shown is the list of users who have logged into the Marketplace Portal at least once.

2. In the **Users** tab, select the user whose subscription you want to transfer.

3. In the **Subscriptions** tab, select the subscription you want to transfer.
4. In the **Overview** tab click **Transfer**.
5. Select the **User Name** of the subscriber to whom the subscriptions will be transferred.
6. Click **Transfer**.
7. Click **Yes** to confirm the transfer.

Cancel Subscriptions

For more information about the **Operations** area, see "Operations" on page 292.

You can cancel subscriptions when the service instance status is one of the following:

- Online
- Modification Failed
- Cancellation Failed
- Expiration Failed
- Public Action Failed
- Reserved
- Failed

To cancel a subscription

1. In the left pane of the **Operations** area, select the name of the organization whose subscription you want to cancel. Note that the list of subscribers shown is the list of users who have logged into the Marketplace Portal at least once.
2. In the **Users** tab, select the user whose subscription you want to cancel.
3. In the **Subscriptions** tab, select the subscription you want to cancel.
4. In the **Overview** tab click **Cancel**.
5. Click **Yes** to confirm.

View Events for a Subscription

For more information about the **Operations** area, see "Operations" on page 292.

> **Note:** This view refreshes every sixty seconds if the subscription status is Pending or Paused and will continue to refresh until a stable subscription status is reached.

To see events for a subscription

1. In the left pane of the **Operations** area, select the name of the organization whose subscription events you want to see. Note that the list of subscribers shown is the list of users who have logged into the Marketplace Portal at least once.
2. In the **Users** tab, select the user whose subscription events you want to see.
3. In the **Subscriptions** tab, select the subscription whose events you want to see.
4. Select the **Events** tab.
5. In the **Events** tab, see event details for subscription, as described in the following table. Select an event to see more details, as described in "Subscription Events Overview" on the facing page.

Item	Description
Event Time	The time the event occurred.
Lifecycle State	The lifecycle state and substate in which the event occurred.
Action	The name of the action.
Source	The source of the event, which can be a service component, resource binding, or a resource subscription.

Item	Description
Status	The current status of the event, which can be one of the following: • Initialized • Active • Completed • Error • Canceled • Failure • Timeout

Subscription Events Overview

For more information about the **Operations** area, see "Operations" on page 292.

Note: This view will refresh every sixty seconds if the event status is Initialized or Active and continue refreshing until a stable event status is reached.

To see subscription event overview information

1. In the left pane of the **Operations** area, select the name of the organization whose subscription events you want to see. Note that the list of subscribers shown is the list of users who have logged into the Marketplace Portal at least once.
2. In the **Users** tab, select the user whose subscription events you want to see.
3. In the **Subscriptions** tab, select the subscription whose events you want to see.
4. Select the **Events** tab.
5. Select the event whose overview information you want to view.

In the **Overview** tab, see the following information for the action:

Item	Description
Event Time	The time the event occurred.
Event ID	The internal identifier of the event.
Action	The name of the action.
Source	The source of the event, which can be a service component, resource binding, or a resource subscription.
Process Engine	The process engine that contains the process definition that created the action.
Process Engine Type	The type of process engine that contains the process definition that created the action.
Process URI	The URI of the action.
Process ID	The process identifier of the event. In the case of an HP Operations Orchestration process engine type, the Process ID corresponds to the OO Run ID of the flow execution.
Additional Details	Other important information about the event.

View Subscription Event Properties

For more information about the **Operations** area, see "Operations" on page 292.

> **Note:** This view will refresh every sixty seconds if the event status is Initialized or Active and continue refreshing until a stable event status is reached.

To see subscription event properties

1. In the left pane of the **Operations** area, select the name of the organization whose subscription event properties you want to see. Note that the list of subscribers shown is the list of users who have logged into the Marketplace Portal at least once.

2. In the **Users** tab, select the user whose subscription event properties you want to see.
3. In the **Subscriptions** tab, select the subscription whose event properties you want to see.
4. Select the **Events** tab.
5. Select the event whose properties you want to view.
6. In the **Properties** tab, see the properties for the event, which are the property values supplied to the action when it executed.

View Topology for a Subscription

For more information about the **Operations** area, see "Operations" on page 292.

> **Note:** This view refreshes every sixty seconds if the subscription status is Pending or Paused and will continue to refresh until a stable subscription status is reached.

For topology designs, the **Topology** tab shows the current set of components (nodes) that make up the service instance. In the graphical view, arrows indicate the relationships between the service instance components.

For sequenced designs, the **Topology** tab shows the current service instance topology for a deployed subscription. In the graphical view, arrows indicate the relationships between the following types of nodes:

- **Service components** - A service component is defined in the associated service design and may also be created during the provisioning of the subscription
- **Resource bindings** - A resource binding is a link in a service design between a resource offering and a service component. A resource binding includes user-defined, provider-selection actions that run during the provisioning of the resource binding. The lifecycle actions defined on the resource offering run during the provisioning of the associated resource subscription.
- **Resource subscriptions** - A resource subscription is created from a resource offering at the time a subscription is ordered, and it can be thought of as a subscription to a resource offering. When a subscription (and its associated service design) is provisioned, a service instance topology is created from the service design. This topology includes copies of every service component in the associated service design. Resource offerings that are included in the service

design are copied into the service topology as resource subscriptions. Changes made to the original resource offering after a resource subscription has been created from it do not affect the resource subscription or the associated user subscription. During resource subscription provisioning, the lifecycle actions that were configured on the source resource offering are executed.

- **Resource providers** - A resource provider is used to provision a subscription. Resource provider selection occurs during the resource binding provisioning process. See also, "View Providers for a Subscription" on page 306.

To view topology for a subscription

Use the following icons and features to navigate and perform tasks in the **Topology** tab:

Icon	Description
Drop-down list	Select an instance type to filter the content in this view.
	Type search text to filter results based on: • Node type • Lifecycle state • Lifecycle substate • Node label Nodes that match the search criteria appear highlighted in the topology diagram.
	Click to display a tile view.
	Click to display a list view.
	Click to display a graphical view of the content. For topologies that exceed 100 nodes, it is suggested that you use either the tile or list view. The graphical view display may not be legible for topologies that contain more than 100 nodes.

1. In the left pane of the **Operations** area, select the name of the organization whose subscription topology you want to see. Note that the list of subscribers shown is the list of users who have

logged into the Marketplace Portal at least once.

2. In the **Users** tab, select the user whose subscription topology you want to see.

3. In the **Subscriptions** tab, select the subscription whose topology you want to see.

4. Select the **Topology** tab, where you can see the following information:

5. In the **Topology** tab, you see the service topology for the subscription, which shows the following information:
   - Each service component, resource binding, and subscription in the topology has one or two icons that show 1) the current lifecycle state and 2) the transition substate (if applicable) for that node. If a node has a transition substate icon, it is displayed directly beneath the lifecycle state icon (see state icons in table below).

   - If a subscription or service instance is in a **Failed** state, the icons represent the state and substate (if applicable) at the time of the failure.

   - Nodes with a pattern icon ( ), and whose labels are surrounded by brackets (note that brackets are displayed only in the graphical view), indicate that the nodes are specified as **Patterns**. For example, the following label indicates the node is a pattern:

     ```
     [2. Windows Server]
     ```

   - Component order is displayed only in the graphical view: Nodes that have a specified **Component Order** (which defines the lifecycle execution order) are preceded by a number indicating the specified order. For example, the following label indicates that this node has a **Component Order** of two (2):

     ```
     2. Windows Server
     ```

     Due to layout algorithms, nodes are not sortable by **Component Order**.

Note: In some cases you may see an Updated state. Updated is a stable state (which immediately precedes the start of the Modifying transition state) for a resource subscription, resource binding, or service component that is undergoing a subscription modification. The Updated state does not display in the lifecycle diagram, and actions cannot be configured at this state.

The icons in this view are described in the following table:

Icon	Description
	Node is specified as a pattern
	Described lifecycle state
	Initializing lifecycle state
	Initialized lifecycle state
	Reserving lifecycle state
	Reserved lifecycle state
	Deploying lifecycle state
	Deployed lifecycle state
	Un-deploying lifecycle state
	Un-reserving lifecycle state
	Un-initializing lifecycle state
	Finalized lifecycle state
	Modifying lifecycle state
	Pre-Transition substate
	Transition substate
	Post-Transition substate
	Pre-transition substate, paused provisioning
	Transition substate, paused provisioning

Icon	Description
	Post-Transition substate, paused provisioning
	Failure substate

To view a topology summary

Click in the graphical view's white space outside of a node to view a list and count of the instance types in the topology in the right pane of the **Topology** tab.

To view properties for a topology node

Click on any node to see all configured properties and values for the node displayed in the right pane of the **Topology** tab.

Graphical view controls

The graphical view provides the following controls to help you properly display the topology:

Icon	Description
	Zoom the display in.
	Zoom the display out
	Automatically fit the diagram within the display area.
	Return to default size
	Reset nodes to their default positions.

View Providers for a Subscription

For more information about the **Operations** area, see "Operations" on page 292.

The **Providers** tab shows information about the providers used by a subscription. Resource provider selection occurs during the resource binding provisioning process for sequenced designs and is determined at design time for topology designs.

> **Note:** This view refreshes every sixty seconds if the subscription status is Pending or Paused and will continue to refresh until a stable subscription status is reached.

To view providers for a subscription

1. In the left pane of the **Operations** area, select the name of the organization whose subscription providers you want to see. Note that the list of subscribers shown is the list of users who have logged into the Marketplace Portal at least once.
2. In the **Users** tab, select the user whose subscription providers you want to see.
3. In the **Subscriptions** tab, select the subscription whose providers you want to see.
4. Select the **Providers** tab.
5. In the **Providers** tab, you see the resource provider information for the subscription.

Resume or Cancel a Paused Subscription

A paused subscription is a subscription that has stopped being provisioned in response to an error occurring during the initial order of the subscription. For more information about paused subscriptions, see "View Subscriptions for a User" on page 293.

To resume a paused subscription

1. When a subscription is paused, a notice displays above the **Overview**, **Events**, **Topology**, and **Provider** tabs.
2. To resume the subscription provisioning, you must first fix the issues that caused the provisioning to fail, and then click **Resume Provisioning**.

To cancel a paused subscription

If the root cause of the provisioning failure cannot be resolved, you can cancel a paused subscription.

1. When a subscription is paused, a notice displays above the **Overview**, **Events**, **Topology**, and **Provider** tabs.

2. To cancel the paused subscription, click **Cancel Subscription**.

CSA performs the following actions in response to a request to cancel a paused subscription:

1. Invokes Failure substate actions on any service component, resource binding, or resource subscription that failed and had caused the subscription to be paused.

2. Sends a notification to the subscriber indicating that the paused subscription cannot be resumed because the underlying cause has not been resolved, and the subscription is being canceled.

3. Submits a cancel subscription request on behalf of the subscriber, canceling the user's subscription.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