HP Cloud Service Automation and HP Helion Codar

Cloud Service Management Console Help

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Contents

Welcome to HP Cloud Service Automation

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

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.

- **Administrator** - The Administrator has access to all functionality in the Cloud Service Management Console.

- **Consumer Service Administrator** - The Consumer Service Administrator configures and manages consumer organizations.

- **Resource Supply Manager** - The Resource Supply Manager creates and manages cloud resources, such as resource providers and resource pools.

- **Service Business Manager** - The Service Business Manager creates and manages 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, component templates, and resource offerings.

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

Consumer Organization Roles

The consumer organization roles authorize access to the Marketplace Portal.

- **Consumer Organization Administrator** - The Consumer Organization Administrator configures and manages the consumer organizations.

- **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.

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.

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	Administrator, Consumer Service Administrator, Consumer Organization Administrator

Providers	
Summary	Manage providers.
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, manage environments, and manage resource pools.
Role Access	Administrator, Resource Supply Manager

Designs	
Summary	Manage service designs, components, and resource offerings for designs.

Designs	

Details	• **Service Designs**
	
	    ◾ **Sequenced Designs** - View, create, edit, copy, import, export, or delete a service design, components, and resource offerings. **Note:** This functionality is not available in HP Helion Codar.
	
	    ◾ **Topology Designs** - View, edit, copy, import, export, publish, test or delete a service design, components, profiles, and palettes.

Role Access	Administrator, Service Designer

Offerings	
Summary	Manage service offerings. **Note:** This functionality is not available in HP Helion Codar.
Details	View, create, edit, import, export, or delete service offerings. Configure options and pricing for service offerings. Associate documents and screenshots with service offerings. Create new versions of service offerings. Publish and unpublish service offerings.
Role Access	Administrator, Service Business Manager

Catalogs	
Summary	View, create, edit, import, export, or delete service catalogs and publish service offerings to the Marketplace Portal. **Note:** This functionality is not available in HP Helion Codar.

Catalogs	
Details	• **Overview** - Customize a catalog. • **Access Control** - Configure who can access a catalog. • **Approval Policies** - Add or edit an approval policy. • **Categories** - Create, edit, or delete categories. • **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. • **Environments** - View or select an environment for a catalog.
Role Access	Administrator, Service Business Manager

Operations	
Summary	View and manage subscriptions and service instances for all consumer organizations. **Note:** This functionality is not available in HP Helion Codar.
Details	• View user subscriptions for an organization • View subscriptions for a user • Transfer subscriptions • Cancel subscriptions • View topology for a subscription • View providers for a subscription
Role Access	Administrator and Service Operations Manager

Cloud Analytics	
Summary	Integrate with HP IT Executive Scorecard. **Note:** This functionality is not available in HP Helion Codar.

Cloud Analytics	
Details	If integration is configured, a place to view scorecards and dashboards so that Resource Supply Managers and Service Business Managers have insight into how to measure and optimize the cost, risk, quality and value of IT services and processes.
Role Access	Administrator, Resource Supply Manager, and Service Business Manager

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 provider roles (Consumer Service Administrator, Administrator, Resource Supply Manager, Service Business Manager, Service Designer, Service Operations Manager)

Managing the Software License

HP Cloud Service Automation License

HP Helion Codar License

HP Cloud Service Automation License

Concepts

You can use the Cloud Service Management Console to view, add, or remove software licenses if you are logged in as 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.

You must be logged in as Administrator to access the software licensing area and add and remove licensing.

> **Note:** The **Manage Software License** dialog box cannot be viewed in areas of the product that use Flash Player. It is recommended that you open the dialog box from the Dashboard.

Tasks

To perform the following tasks, go to the Cloud Service Management Console masthead, click the arrow next to the user name, and select **Licensing**.

- **View the following information about your software 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).

- **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.

- **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.

HP Helion Codar License

License management for HP Helion Codar is the same as for HP CSA, as described earlier in this topic.

The following license types are available:

- HP CSA permanent license only.

- HP Helion Codar permanent license only.

- Upgrade to HP Helion Codar for an HP CSA installation.

- Upgrade to HP CSA for an HP Helion Codar installation.

- HP CSA & HP Helion Codar license. This license can be applied only if you already have both HP CSA and HP Helion Codar licenses applied.

If you install HP CSA, then you must add an HP CSA license first; if you install HP Helion Codar, then you must install an HP Helion Codar license first. After you apply a base license, you can add an upgrade license, if desired. If you have licenses for both, you can apply an HP CSA & HP Helion Codar license.

OSI Capacity

If you have separate HP CSA and HP Helion Codar licenses, then the OSI capacity is the lower of the two. If you add an HP CSA & HP Helion Codar license, its OSI capacity is added to the lower of the two. For example, if you have an HP CSA license with 100 OSI and an HP Helion Codar license with 50 OSI, your OSI capacity is 50. If you add an HP CSA & HP Helion Codar license that has 25 OSI, your OSI capacity is increased to 75.

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 over 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 41 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 manages only consumer 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 can use the **Organizations** area of the Cloud Service Management Console to modify this default consumer organization, as needed.

See "LDAP" on page 36 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 the previous page

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 28

   - "Portal Customization" on page 30

- "Dashboard Widgets" on page 33

- "LDAP" on page 36

- "Access Control" on page 41

- "Email Notifications" on page 43

- "Operations" on page 45

- "Catalogs" on page 47

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 25

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 25

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 the next page).

For more information about organizations, see "What are Organizations?" on page 25

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. If you change the **Organization Display Name** of the out-of-the-box consumer organization (CSA Consumer), then you must also update the `seededorgs.properties` file. For more information, see the "Configure Seeded Authentication" section in the *HP Cloud Service Automation Configuration Guide*.
Description	A description of the organization.

Item	Description
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\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 25

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 Options	■ **Allow Recurring Subscriptions** - Check the box to allow recurring subscriptions, rather than requiring all subscriptions to be term subscriptions. ■ **Max Term Subscription Period (months)** - Select the maximum number of months (between 1 and 12) allowed for term subscriptions. When subscribers request a term subscription, they will not be able to specify an end date that is more than this number of months past the start date. For example, if the subscriber selects a requested start date of June 15 2014, and **Max Term Subscription Period (months)** is set at its default value of 12, the requested end date cannot be later than June 14, 2015. This setting has no impact on recurring subscriptions.
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 ■ Custom - Select **Custom**, and type a custom theme name in the text box. See the "Custom Themes" section in the *Customizing the Marketplace Portal* guide for specific information about configuring a custom theme.

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 25

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. • URL - The URL that the link references 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. • 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 41.

For more information about organizations, see "What are Organizations?" on page 25

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 (LDAP Data Interchange Format) 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. For more information about available roles, see the *Welcome to HP Cloud Service Automation* topic in this help system. Adding a DN to the 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.

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. .

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 36 for more information.

For more information about organizations, see "What are Organizations?" on page 25

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**.

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.

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 Address	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.

Subscription Expiration Notification

Item	Description
Notification Before a Subscription Expires	From the drop-down list, select how far in advance a subscriber will be notified before a subscription expires.

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 depending on how the underlying service design was created: • Most sequence based designs contain fine-grained lifecycle actions; therefore, the provisioning is able to resume from the specific lifecycle action that failed during deployment, and actions that have already succeeded are not repeated. • Topology designs that are based on HP Helion OpenStack® involve a single call to HP Helion OpenStack® to provision the design. In this case, a failure, followed by a resume, of the provisioning will result in a brand new HP Helion OpenStack® provisioning of the design. • For topology designs not based on HP Helion OpenStack®, the behavior is always Fail Subscriptions on Provisioning Errors, regardless of the organization setting.
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 43 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 43 for the CSA-Provider organization).

Item	Description
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 41. 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 41. 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 25

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.

Providers

This topic contains the following sections:

- Concepts

- Tasks

- Best Practices

Concepts

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.

Provider Types

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. 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.

Tasks

You can perform the following tasks in this area:

- **View providers by type** - In the drop-down box, select to view providers **By Type**. Provider types are listed in the left pane. The list of providers contained by the type displays in the right pane.

  Disabled providers are indicated by the disabled icon ( ) and will not be selected when provisioning new services.

- **Manage provider types** - In the drop-down box, select **By Type**. Select the manage icon (⚙). For more information, see "Manage Provider Types" on the next page.

- **Create a Provider** - In the drop-down box, select **By Type**. In the left pane, select **All Providers**, or select the type for which you want to create a provider. In the right pane, select the **Providers** tab. Click **Create** to add a provider with the selected provider type. See "Provider Overview" on page 52 for more information about configuring a provider.

- **See more information about a provider** - Click a provider to see more information about the provider.

Best Practices

- Locked items (🔒) cannot be deleted.

- You can select whether to see the content in card view (▦) or table view (☰).

- HP Helion OpenStack® is a special provider type that is used for HP Helion OpenStack® based topology designs. For these types of designs you must have an HP Helion OpenStack® provider configured prior to creating topology designs, and it must contain a tenant property that is set appropriately for your HP Helion OpenStack® environment.

Components (Per Provider Type)

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

Concepts

The components tab for a selected resource provider type shows all the components available for that provider type. When components are imported into HP CSA, they are associated with a single provider type, and all provider instances of that type support the component.

> **Note:** Provider components are applicable only to topology designs and are not applicable to sequenced designs.

Tasks

- **View components associated with the selected provider type** - See the list of components in the right pane.

- **Launch the component management area of the Cloud Service Management Console** - Click a component. Or click the **Manage** button (or the **Manage Components** button if no components exist). You must have Service Designer role access to perform this task.

Manage Provider Types

Tasks

You can perform the following tasks in this area:

- **Create (+) a provider type** - Provide the information listed in the table below.

- **Edit ( ) a provider type** - See the table below for the items you can edit.

- **Delete (—) a provider type** - A provider type cannot be deleted if any resource offerings or providers of that provider type exist. Out-of-the-box provider types also cannot be deleted.

Item	Description
Name	A name that is automatically generated by HP CSA, and which may be needed when importing components for topology designs.
Display Name	The display name you provide for the provider type.
Description	The description you provide for the provider type.

Item	Description
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\standalone\deployments\csa.war\images\library` folder of the HP CSA server.

Provider Overview

Concepts

For more information about resource providers, see "Providers" on page 49.

Tasks

You can perform the following tasks:

- **Create or Edit a provider** - In the right pane, select the **Providers** tab. Click **Create** in the main Providers area or click **Edit** in the **Overview** tab. See the table below for the items you can edit.

- **Delete a provider** - Click **Delete**. 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 resource 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.

Item	Description
Provider Type	The type selected for this provider. Note that the **Provider Type** cannot be changed after a provider is created.

Item	Description
Display Name	The name you provide for the provider.
Description	The description you provide for the provider.
User ID	The user ID for the specified Service Access Point.
Password	The password for the specified Service Access Point. Re-type the password in the **Confirm Password** field.
Service Access Point	Specify a URL for connecting to the provider. The following examples show how to connect to some common resource providers: • HP Helion OpenStack® - `http://<HP Helion OpenStack® 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://<UCMB server IP>:8080` • VMware vCenter - `https://<vCenter server IP>:443` • Chef - `https://<Chef 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. Note: User credentials are not validated at this time.
Image	Select an image to be displayed with the provider.
Enabled	This value determines whether the provider will be selected when provisioning a new service. The setting is either **Enabled** (when checked) or **Disabled** (when not checked). 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.

Best Practices

The HP Helion OpenStack® 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 HP Helion OpenStack® 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 HP Helion OpenStack® environment.

Provider Properties

Concepts

For more information about resource providers, see "Providers" on page 49.

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. Provider properties can also be read during the provisioning of topology designs. When a non-HP Helion OpenStack® based topology design is provisioned, the tenant property on the HP Helion OpenStack® provider is inspected to influence the provisioning in HP Helion OpenStack®. When a non-HP Helion OpenStack® based topology design is provisioned, an HP Operations Orchestration flow can read and write provider property values.

Tasks

Custom properties are optional, and are needed only if the provisioning process requires them. For example, provider properties may be used by HP Operations Orchestration flows during service provisioning of sequenced or topology designs or by HP Helion OpenStack® during service provisioning of HP Helion OpenStack® based topology designs.

- **Create provider properties** - Click **Create**. Provide the information listed in the following table.

- **View property description** - Click the information (𝒾) icon.

- **Edit provider properties** - Click the edit ( ) icon. See the following table for the items you can edit.

- **Delete provider properties** - Click the ( ) delete icon.

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 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. • **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. • **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. The maximum allowed integer value is 2147483647 and the minimum is -2147483648; if you enter a value outside these bounds the value will be automatically converted to the closest maximum or minimum

Item	Description
	value. ***For String properties:*** • **Name** - A unique name for the property. • **Display Name** - The display name for the property. • **Description** - A description of the property. • **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.

Provider Environments

Concepts

For information about resource providers, see "Providers" on page 49.

Tasks

- **View environments associated with the selected provider** - See the list of environments.

- **Select a resource environment**- Click **Select**. In the dialog box, add or remove resource environments to or from the resource provider.

Provider Offerings

Concepts

For information about resource providers, see "Providers" on page 49.

> **Note:** Provider offerings are applicable only to sequenced designs and are not applicable to topology designs.

Tasks

- **View resource offerings associated with the selected provider** - See the list of offerings.

- **Select a resource offering** - Click **Select**. In the dialog box, add or remove offerings to or from the resource provider.

Resource Pools

Concepts

For more information about resource providers, see "Providers" on page 49.

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.

Tasks

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

- **View resource pools for the selected provider** - See the list of resource pools and their descriptions. Disabled resource pools are indicated by the disabled icon ( ) and will not participate in resource allocation processing for new subscriptions.

- **Create a resource pool** - Click **Create**. Provide the information listed in the following table.

- **See more information about a resource pool** - Click the resource pool whose information you want to view.

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 name this resource pool is known by in the associated resource provider. For example, if this resource pool corresponds to a VMware vCenter cluster, this value would be the exact cluster name configured in VMware vCenter.

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 "Resources for a Resource Pool" on the next page. 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*. The **Last Synchronized** field in the **Overview** tab of the resource pool indicates the last time (local client time) a resource synchronization action on a resource pool completed successfully.
Enabled	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.

Best Practices

In the **Overview** 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.

Overview for a Resource Pool

Concepts

For more information, see "Resource Pools" on page 58.

Tasks

- **Edit a resource pool** - Click **Edit**. See the table in "Resource Pools" on page 58 for the items you can edit.

- **Delete a resource pool** - Click **Delete**. A resource pool cannot be deleted unless the **Current CSA Utilization** for each resource configured on the pool is zero.

- **Synchronize a resource pool** - Click **Synchronize**. This action automatically updates the **Resources** tab information with the latest information. The **Synchronize** button is available only when a **Resource Synchronization Action** is configured. 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.

> **Note:** The **Last Synchronized** field in the **Overview** tab of the resource pool indicates the last time (local client time) a resource synchronization action on a resource pool completed successfully. Note that the contents in this screen do not update automatically, and you may need to refresh this screen after the resource synchronization action completes.

Resources for a Resource Pool

Concepts

For more information about resource pools, see .

You can 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.
Physical Server	Number of physical servers.
Power	Kilowatts (KW) of power.

Resource	Unit of Measurement
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.

Tasks

- **View resources for a resource pool** - See the list of resources, as well as availability and capacity.

- **Add a resource to a resource pool** - Click **Add**. Provide the information listed in the following table.

- **Edit a resource** - Click the edit ( ) icon. See the following table for the items you can edit.

- **Delete a resource from a resource pool** - Click the delete ( ) icon. 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)).

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.

Item	Description
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 "Resources for a Resource Pool" on page 61 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 "Resources for a Resource Pool" on page 61 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.

Components (Per Provider Instance)

Concepts

For information about resource providers, see "Providers" on page 49.

Note: Provider components are applicable only to topology designs and are not applicable to sequenced designs.

Tasks

You can perform the following tasks in this area:

- **View components associated with the selected provider instance** - See the list of components in the right pane.

- **Launch the component management area of the Cloud Service Management Console** - Click a component. Or click the **Manage** button (or the **Manage Components** button if no components exist). You must have Service Designer role access to perform this task.

Environments

This topic contains the following sections:

- Concepts

- Tasks

- Best Practices

Concepts

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

In addition, environments can be linked to a service catalogs to support distribution of resource provisioning.

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.

> **Note**: When you have resource environments associated with a catalog that contains service offerings that are created from topology designs that are not based on HP Helion OpenStack® components and HP Helion OpenStack® provider types, a subscriber option set is automatically created for the design and is called **<Provider_Type_Display_Name> Environment and Provider Selection**.
>
> The new subscriber option set contains all environments associated with the catalog that contain enabled providers capable of provisioning the components type used in the design that are of the provider type specified in this option set. The option set also contains an option (**Any Environment**) that, if selected, indicates that providers in any environment may be selected.
>
> All options except (**Any Environment**) contain a single **List** property (**Providers**) that includes the

list of provider instances in the environment that are capable of provisioning the components used in the design that are of the provider type specified in this option set. The list also includes **Any Provider In This Environment**, which means that any provider in the selected environment can be selected.

Exposing provider selection to subscribers can be disabled if desired; for more information, see the "Cloud Service Management Console Properties" section in the *HP Cloud Service Automation Configuration Guide*.

Tasks

You can perform the following tasks in this area:

- **View providers by environment** - In the drop-down box, select to view providers **By Environment**. Environments are listed in the left pane. The list of providers contained by the environment is displayed in the right pane. Disabled providers are indicated by the disabled icon (

) and will not be selected when provisioning new services.

- **Manage environments**- In the drop-down box, select **By Environment**. Select the manage icon (

). For more information, see "Manage Environments" on the next page.

- **Select providers to include in an environment** - In the drop-down box, select **By Environment**. Select the environment in which you want to include a provider. Click the **Select** button. In the dialog box, add or remove resource providers to or from the environment. If desired, use the drop-down box in the dialog to filter the resource provider list by provider type.

Best Practices

- Locked items (🔒) cannot be deleted.

- You can select whether to see the content in card view (▦) or table view (☰).

Manage Environments

Tasks

You can perform the following tasks in this area:

- **Create (+) a resource environment** - Provide the information listed in the table below.

- **Edit (✎) a resource environment** - See the table below for the items you can edit.

- **Delete (—) a resource environment** - 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.

Item	Description
Display Name	The display name you provide for the environment.
Description	The description you provide for the environment.
Image	An image that displays for the environment. 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\standalone\deployments\csa.war\images\library` folder of the HP CSA server.

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. **Note:** This functionality is not available in HP Helion Codar.

- **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 79). 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 93, which allow resource offerings to be assigned to service components.

- Lifecycle actions (see "Lifecycle Actions for Service Components" on page 108, which are needed to provision and de-provision service components.

- Properties (see "Custom Service Component Properties" on page 83), which allow you to configure user-defined properties for service components.

- Subscriber options (see "Subscriber Options" on page 121, 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 71).

5. Use the **Designer** (see "Sequenced Designer" on page 77) to create a hierarchy of service components (see "Create a Service Component" on page 80).

6. Add resource bindings, as needed (see "Create a Resource Binding" on page 93).

7. Create lifecycle actions for service components, as needed (see "Create a Lifecycle Action for a Service Component" on page 113).

8. Create custom properties for service components, as needed (see "Create Custom Service Component Properties" on page 85).

9. Create subscriber options for a service design, as needed (see "Subscriber Options" on page 121).

10. Complete the service design (blueprint) and ensure the **Disabled** box is not selected (see "Add a Service Design" on page 71). 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 67.

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.

Item	Description
Import button	Click to import a service design
(help icon)	Hover your cursor over this icon to see more information.
(error icon)	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 67.

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" on the next page.

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 74.

- Click **Save As** to save the service design with a different name. For more information, see "Copy a Service Design" on page 73

- Click **Edit** to edit the name and description of a service design. For more information, see "Edit Service Design Properties" on page 72.

- Click **Delete** to delete the service design. For more information, see "Delete a Service Design" on page 73.

You can also see design information in the following tabs:

- **Designer** tab - for more information see the topic "Sequenced Designer" on page 77.

- **Subscriber Options** tab - for more information see the topic "Subscriber Options" on page 121. This tab is available only for sequenced designs.

Add a Service Design

For more information about sequenced designs, see "Sequenced Designs" on page 67.

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 80.

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\standalone\deployments\csa.war\images\library` folder of the HP CSA server.

Item	Description
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 136. To remove a tag, hover the cursor over the tag you want to remove, and click the delete (⊗) icon.

Service Design Validation

For more information about sequenced designs, see "Sequenced Designs" on page 67.

The validation warning banner indicates that your service design has the following problem:

- The service design has at least one resource binding to a resource offering that has no enabled, associated provider. For more details, click **View Warnings**. You can then click an **Associated Service Component** display name, which takes you to that component in the service design hierarchy. If this service design problem is not corrected, the design cannot be successfully provisioned.

Edit Service Design Properties

For more information about sequenced designs, see "Sequenced Designs" on page 67.

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 71.

5. Click **Save**.

Copy a Service Design

For more information about sequenced designs, see "Sequenced Designs" on page 67.

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 **Save As** button. Type a new name and description, as desired.

4. Click **Save**. After you click **Save**, the new service design is displayed.

All parts of a service design (such as the service component hierarchy, resource bindings, properties, and subscriber options) are copied. The copied service design appears in the **All Designs** area. 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 67.

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 .

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.

The archive (`.zip`) file can only reference files or content contained within the `.zip` file itself, or that are already contained in the `csa.war` file. By default, all images in the archive files must end in one of

the following suffix values. For information on adding additional suffix values, see the *HP Cloud Service Automation Configuration Guide*.

jpg|jpeg|jpe|jfif|svg|tif|tiff|ras|cmx|ico|pnm|pbm|pgm|ppm|rgb|xbm|xpm|xwd|png|gif|
bmp|cod|ief

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.

> **Note:** When you import a design, any tags you have selected in the designs area do not affect the imported design. The imported design will contain the tags that were included when the design was exported, and new tags will be created on the system, as necessary, to match what was exported.

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 67.

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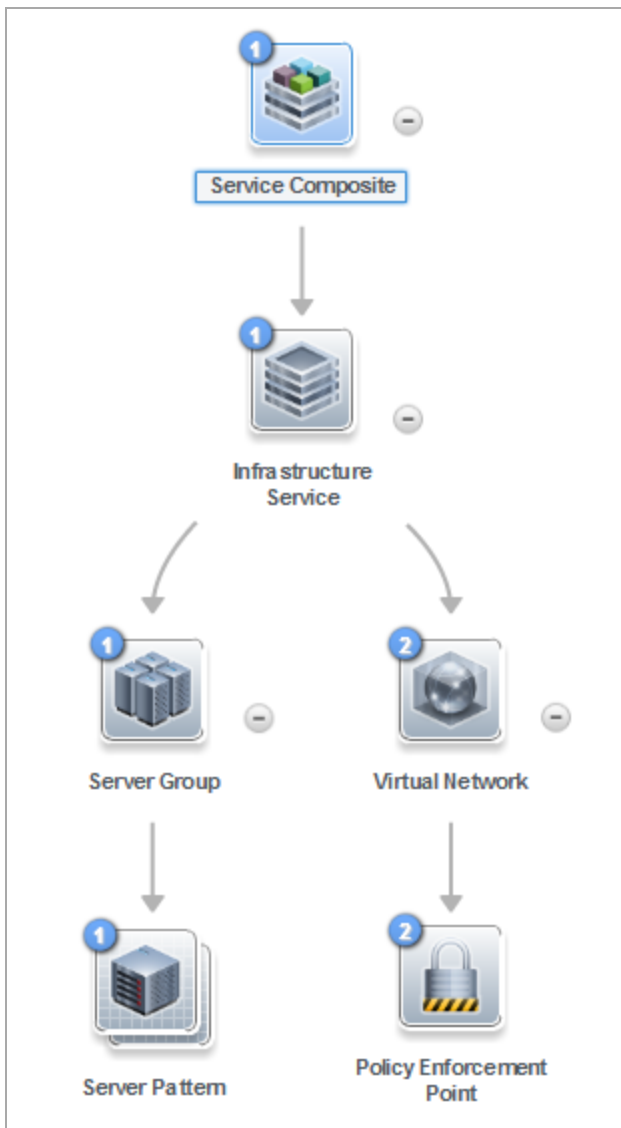
To see the component type of a service design element, hover your mouse over the icon for that element. Also, the icon for the element corresponds to the image specified for the component type.

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 67.

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" below

- "Delete a Service Component" on page 82

- "Edit Properties of a Service Component" on page 82

- "Lifecycle Actions for Service Components" on page 108

- "Custom Service Component Properties" on page 83

Create a Service Component

For more information about sequenced designs, see "Sequenced Designs" on page 67.

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.
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.

Item	Description
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. As a result, if you select a pattern as the root node, it will no longer function 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 67.

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 67.

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 80.

Custom Service Component Properties

For more information about service components, see "Service Components" on page 79.

Custom service component properties are managed using the **Properties** pane (shown below) in the **Designer** tab.
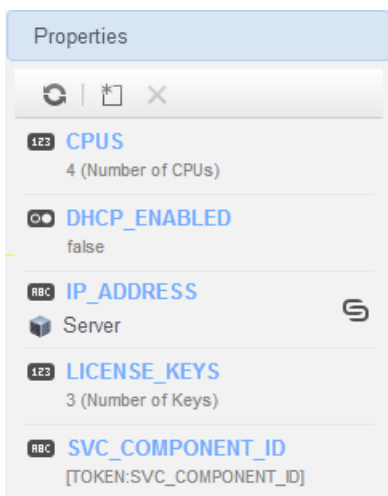
Custom properties for service components are user-defined properties that you may want to create in the following situations:

- 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 121, 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 121.

- 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 next page

- "Delete Custom Service Component Properties" on page 92

- "Edit Custom Service Component Properties" on page 91

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 83.

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 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

Item	Description

	property in the **Subscriber Options** tab. Click **Save** to save the default 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\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.

Item	Description
	- Service Offering ID - Resolves to the Service Offering ID. - 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.

Item	Description
	■ **Required** – Integer 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 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. The maximum allowed integer value is 2147483647 and the minimum is -2147483648; if you enter a value outside these bounds the value will be automatically converted to the closest maximum or minimum value.
	• **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

Item	Description

	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.
	
	   ■ 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 121.

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.

Token	Description
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.
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.

Edit Custom Service Component Properties

For more information about custom service components, see "Custom Service Component Properties" on page 83.

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 85.

Delete Custom Service Component Properties

For more information about custom service components, see "Custom Service Component Properties" on page 83.

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 83. For more information about target bindings, see "Subscriber Options" on page 121.

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.

Resource Bindings

- For more information about sequenced designs, see "Sequenced Designer" on page 77.

- 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" below

- "Delete a Resource Binding" on page 95

- "Create Provider Selection Actions for Resource Bindings" on page 99

- "Edit Properties of a Provider Selection Action for Resource Bindings" on page 98

- "View Properties of a Resource Binding" on page 95

- "Edit Properties of a Resource Binding" on page 96

Create a Resource Binding

For more information about resource bindings, see "Resource Bindings" above.

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.

Item	Description
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 93.

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 93.

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 93.

- **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 99.

- **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 105.

- **Measurable Properties** tab - View and create measurable properties on a resource binding. For more information, see "View Measurable Properties" on page 106.

- **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 93.

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 93.

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 93.

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 93.

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 next 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 118. 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 93.

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 93.

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 105.

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

Internal Action	Description	Applies To
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
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
Deploy Topology Based Service Component	Initiates the deployment of a delegated topology service component. For more information, see the *Application Deployment on Realized Topology Instance using Sequenced Design* white paper.	• 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

Internal Action	Description	Applies To
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
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

Internal Action	Description	Applies To
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
Undeploy Topology Based Service Component	Initiates the undeployment of a delegated topology service component. The service component must have a property named `topologyId`, with a value that is the id of the topology design to be undeployed. For more information, see the *Application Deployment on Realized Topology Instance using Sequenced Design* white paper.	• Service Component

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 93.

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 93.

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 99, 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 93.

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 85). 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" below.

Add and Remove Measurable Properties

For more information about resource bindings, see "Resource Bindings" on page 93.

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 79.

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.
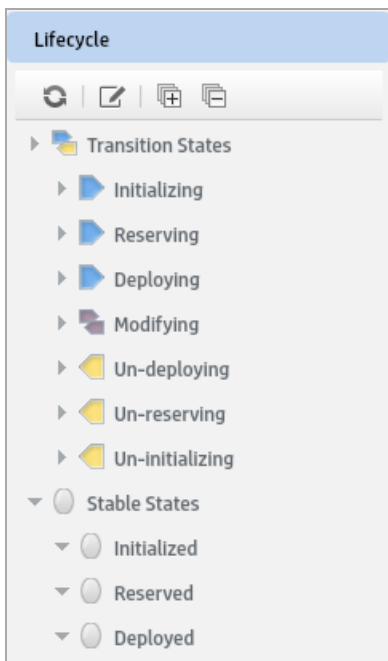
See the following related topics:

- "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 118

- "Edit Properties of a Lifecycle Action for a Service Component" on page 118

- "Move a Lifecycle Action for a Service Component" on page 120

View Properties of a Lifecycle Action for a Service Component

For more information about lifecycles, see "Lifecycle Actions for Service Components" on page 108.

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 108.

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" on the next page. For descriptions of the properties in the **Properties** tab, see the topic "Edit Properties of a Lifecycle Action for a Service Component" on page 118.

Create a Lifecycle Action for a Service Component

For more information about lifecycles, see "Lifecycle Actions for Service Components" on page 108.

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 108.

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 118.

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.

Item	Description
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 (Initialized, Reserved, Deployed). • Visible - When checked, this indicates that the lifecycle action will be available to be run in the Marketplace Portal. The box is checked by default for actions created in stable lifecycle states.
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
Deploy Topology Based Service Component	Initiates the deployment of a delegated topology service component. For more information, see the *Application Deployment on Realized Topology Instance using Sequenced Design* white paper.	• 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
Undeploy Topology Based Service Component	Initiates the undeployment of a delegated topology service component. The service component must have a property named `topologyId`, with a value that is the id of the topology design to be undeployed. For more information, see the *Application Deployment on Realized Topology Instance using Sequenced Design* white paper.	• Service Component

Delete a Lifecycle Action from a Service Component

For more information about lifecycles, see "Lifecycle Actions for Service Components" on page 108.

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 108.

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 108.

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 108.

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 113.

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.

Token	Description
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.
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 108.

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 108.

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 108.
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 67.

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 83.

To use the subscriber options controls

The controls for working with subscriber options are shown and described below.
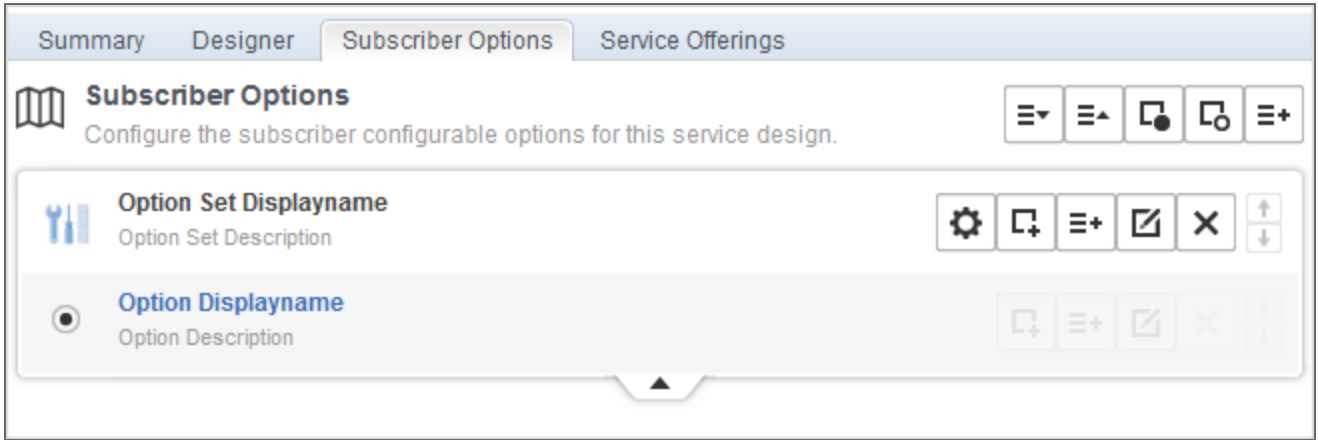
Subscriber Options Controls

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 add a new option set for delegated topology components. This icon is available only for sequenced service designs that delegate execution to an HP CSA topology-based design.
⚙	Click to configure advanced settings (see "Configure Advanced Settings for a Subscriber Option Set" on page 126).
⊡+	Click to create properties (see "Create Subscriber Option Properties" on page 127).

Subscriber Options Controls, continued

Item	Description
�integral edit icon	Click to edit one of the following: • Option set, as described in "Edit Subscriber Option Sets and Options" on page 135. • Option, as described in "Edit Subscriber Option Sets and Options" on page 135. • Property, as described in "Edit Subscriber Option Properties" on page 134.
✕	Click to delete one of the following: • Option set, as described in "Delete Subscriber Option Sets and Options" on page 135. • Option, as described in "Delete Subscriber Option Sets and Options" on page 135. • Property, as described in "Delete Subscriber Option Properties" on page 134.
↑ ↓	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" on the next page

- "Create Subscriber Option Properties" on page 127

- "Configure Advanced Settings for a Subscriber Option Set" on page 126

- "Delete Subscriber Option Sets and Options" on page 135

- "Edit Subscriber Option Sets and Options" on page 135

View Subscriber Options

For more information about subscriber options, see "Subscriber Options" on page 121.

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 121.

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 next page

- "Edit Subscriber Option Sets and Options" on page 135

- "Delete Subscriber Option Sets and Options" on page 135

For descriptions of the additional icons available on the **Subscriber Options** tab, see "Subscriber Options" on page 121.

Configure Advanced Settings for a Subscriber Option Set

For more information about subscriber options, see "Subscriber Options" on page 121.

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 121.

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

Item	Description

	Subscriber Options tab. Click **Save** to save the default 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\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 a subscription is ordered, a value must be provided for this field. This option cannot

Item	Description
	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. The maximum allowed integer value is 2147483647 and the minimum is -2147483648; if you enter a value outside these bounds the value will be automatically converted to the closest maximum or minimum value. • **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.

Item	Description
	Input Validation - Select **Enable Input Validation** to validate the value that the user enters for this property. - 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. The regular expression used for validating the URL values may allow creating some invalid URL values such as `http`, `http:/`, `http://` or `hhh:////`. This is because the regular expression validates a wide range of official IANA-registered schemes, which may not detect some invalid URL values. **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. Note that if a string property with a **Minimum Length** of zero (0) is configured to be **Required** and not **Editable**, then the setting for **Required** overrides the setting for **Minimum Length**, and the value entered for this property must have a length of at least one (1). **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 121.

3. Click **Create**.

Edit Subscriber Option Properties

For more information about subscriber options, see "Subscriber Options" on page 121.

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 127.

Delete Subscriber Option Properties

For more information about subscriber options, see "Subscriber Options" on page 121.

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 121.

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\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 121.

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 page 138

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\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 page 136.

4. Click **Done**

Delete a Tag

For more information about tags, see "Manage Tags" on page 136.

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**.

Components (Sequenced Designs)

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

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
Delegated Topology in HP CSA	Delegates execution to an HP CSA topology-based design.	No component type constraints	No resource category constraints

Out-of-the-Box Component Types, continued

Component Type	Description	Component Type Constraints	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 • Configuratio n Management • Infrastructur e • 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.	• Delegated Topology • 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

Out-of-the-Box Component Types, continued

Component Type	Description	Component Type Constraints	Resource Category Constraints
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
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

Out-of-the-Box Component Types, continued

Component Type	Description	Component Type Constraints	Resource Category Constraints
Service Composite	Often used as the root service component for service designs.	- Delegated Topology - 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
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

Out-of-the-Box Component Types, continued

Component Type	Description	Component Type Constraints	Resource Category Constraints
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 (Sequenced Designs)" on page 138.

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 create 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 (Sequenced Designs)" on page 138.

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\standalone\deployments\csa.war\images\library` folder of the HP CSA server.

Edit a Component Palette

For more information about components, see "Components (Sequenced Designs)" on page 138.

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 145.

5. Click **Done**.

Delete a Component Palette

For more information about components, see "Components (Sequenced Designs)" on page 138.

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 (Sequenced Designs)" on page 138.

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.

- If component templates in a component palette have resource bindings on resource offerings, when the component palette is exported, resource offering XML files are included in the component palette archive.

- At component palette import, resource offerings are either created when a resource offering with same name does not exist on the system, or updated when a resource offering with the same name exists. This resource offering import behavior occurs because the import option for a component palette is always Update.

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 archive (`.zip`) file can only reference files or content contained within the `.zip` file itself, or that are already contained in the `csa.war` file. By default, all images in the archive files must end in one of the following suffix values. For information on adding additional suffix values, see the *HP Cloud Service Automation Configuration Guide*.

`jpg|jpeg|jpe|jfif|svg|tif|tiff|ras|cmx|ico|pnm|pbm|pgm|ppm|rgb|xbm|xpm|xwd|png`

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 (Sequenced Designs)" on page 138.

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.
🔍	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 create 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 .

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\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 (Sequenced Designs)" on page 138.

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 151.

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 160.

- **Templates** tab - for more information see the topic "View Component Templates" on page 162.

Edit a Component Type

For more information about components, see "Components (Sequenced Designs)" on page 138.

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 151.

5. Click **Save**.

Delete a Component Type

For more information about components, see "Components (Sequenced Designs)" on page 138.

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 (Sequenced Designs)" on page 138.

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 152.

- **Constraints** tab - for more information see the topic "View Constraints of a Component Type" on page 160.

- **Templates** tab - for more information see the topic "View Component Templates" on page 162.

Create Component Type Properties

For more information about components, see "Components (Sequenced Designs)" on page 138.

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 (Sequenced Designs)" on page 138.

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, click the edit (   ) icon 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 155.

Delete Component Type Properties

For more information about components, see "Components (Sequenced Designs)" on page 138.

> **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, click the delete (✖) icon 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 (Sequenced Designs)" on page 138.

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 152.

- **Properties** tab - for more information see the topic "View Component Type Properties" on page 154.

- **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 (Sequenced Designs)" on page 138.

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 (Sequenced Designs)" on page 138.

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

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 (Sequenced Designs)" on page 138.

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 166

- **Properties** tab - for more information see the topic " " on page 166.

- **Lifecycle** tab - for more information see the topic "View Component Template Lifecycle Actions" on page 172.

- **Resource Bindings** tab - for more information see the topic "View Component Template Resource Bindings" on page 178.

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 create 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 (Sequenced Designs)" on page 138.

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 base component type image is used 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 (Sequenced Designs)" on page 138.

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 (Sequenced Designs)" on page 138.

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 (Sequenced Designs)" on page 138.

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 164.

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 next page.

- **Lifecycle** tab - for more information see the topic "View Component Template Lifecycle Actions" on page 172.

- **Resource Bindings** tab - for more information see the topic "View Component Template Resource Bindings" on page 178

View Component Template Properties

For more information about components, see "Components (Sequenced Designs)" on page 138.

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 the base component type hierarchy. 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 172.

- **Resource Bindings** tab - for more information see the topic "View Component Template Resource Bindings" on page 178

Create Component Template Properties

For more information about components, see "Components (Sequenced Designs)" on page 138.

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 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. **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 (Sequenced Designs)" on page 138.

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 edit ( ) icon for the property you want to 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 167.

Delete Component Template Properties

For more information about components, see "Components (Sequenced Designs)" on page 138.

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, click the delete () ▬ icon for the property you want to delete.

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

View Component Template Lifecycle Actions

For more information about components, see "Components (Sequenced Designs)" on page 138.

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 166.

- **Properties** tab - " " on page 166

- **Resource Bindings** tab - for more information see the topic "View Component Template Resource Bindings" on page 178

Create a Lifecycle Action for a Component Template

For more information about components, see "Components (Sequenced Designs)" on page 138.

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 (Initialized, Reserved, Deployed). • Visible - When checked, this indicates that the lifecycle action will be available to be run in the Marketplace Portal. The box is checked by default for actions created in stable lifecycle states.
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
Deploy Topology Based Service Component	Initiates the deployment of a delegated topology service component. For more information, see the *Application Deployment on Realized Topology Instance using Sequenced Design* white paper.	• 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
Undeploy Topology Based Service Component	Initiates the undeployment of a delegated topology service component. The service component must have a property named `topologyId`, with a value that is the id of the topology design to be undeployed. For more information, see the *Application Deployment on Realized Topology Instance using Sequenced Design* white paper.	• Service Component

Delete a Lifecycle Action from a Component Template

For more information about components, see "Components (Sequenced Designs)" on page 138.

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 (Sequenced Designs)" on page 138.

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 166.

- **Properties** tab - " " on page 166

- **Lifecycle** tab - for more information see the topic "View Component Template Lifecycle Actions" on page 172.

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**. Or, if no resource bindings exist, click the **Create Resource Binding** button in the middle of the window.

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 (Sequenced Designs)" on page 138.

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 166.

- **Properties** tab - " " on page 166

- **Lifecycle** tab - for more information see the topic "View Component Template Lifecycle Actions" on page 172.

Resource Offerings (Sequenced Designs)

Concepts

> **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 HP 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 HP CSA lifecycle. A provider that supports the resource offering is selected during the resource binding provisioning.

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.

Scenarios

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 HP CSA installation. An exported resource offering includes all of its lifecycle actions and properties.

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.

Best Practices

From the Cloud Service Management Console dashboard, navigate to **Resource Offerings** by clicking **Designs**-->**Designs**-->**Resource Offerings**.

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

View Resource Offerings

For more information about resource offerings, see "Resource Offerings (Sequenced Designs)" on page 181.

To view resource offerings

1. 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.

2. 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 (Sequenced Designs)" on page 181.

To create a resource offering

1. In the **By Provider Type** or **By Category** tab, select the provider type or category for the resource offering you want to create.

2. In the toolbar, click the **Create** (⬚) icon.

3. Provide the following information:

Item	Description
Display Name	The name you provide for the offering.
Description	The description you provide for the offering.
Type	The provider type for this offering. This field cannot be changed after an offering is created.
Category	The category for this offering. For more information, see "Categories" on page 209. 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 (Sequenced Designs)" on page 181.

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.

The archive (`.zip`) file can only reference files or content contained within the `.zip` file itself, or that are already contained in the `csa.war` file. By default, all images in the archive files must end in one of the following suffix values. For information on adding additional suffix values, see the *HP Cloud Service Automation Configuration Guide*.

```
jpg|jpeg|jpe|jfif|svg|tif|tiff|ras|cmx|ico|pnm|pbm|pgm|ppm|rgb|xbm|xpm|xwd|png
```

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 the 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 **Offerings** tab, click the **Import** ( ) icon.

2. 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_`.

3. 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.

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 **Yes**.

To export a resource offering

1. In the **By Provider Type** or **By Category** tab, select a **Provider Type** or **Category**.

2. In the **Offerings** tab, highlight the resource offering you want to export, and click the **Export** () icon.

3. 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
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 (Sequenced Designs)" on page 181.

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 **By Provider Type** or **By Category** tab, select a **Provider Type** or **Category**.

2. In the **Offerings** tab, select the offering you want to delete.

3. Select the **Delete** (✕) icon.

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

View Properties of a Resource Offering

For more information about resource offerings, see "Resource Offerings (Sequenced Designs)" on page 181.

To view the properties of a resource offering

Click one of the following the tabs for a resource offering to see more information about it.

- Summary

- Providers

- Lifecycle

- Properties

- Service Designs

Edit Properties of a Resource Offering

For more information about resource offerings, see "Resource Offerings (Sequenced Designs)" on page 181.

To edit a resource offering

1. In the **Summary** tab, click the **Edit** ( ) icon.

2. For descriptions of the specific properties, see the topic "Create a Resource Offering" on page 183.

Copy a Resource Offering

For more information about resource offerings, see "Resource Offerings (Sequenced Designs)" on page 181.

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 (Sequenced Designs)" on page 181.

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.

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 (Sequenced Designs)" on page 181.

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 **Offerings** tab select the **Display Name** of the offering for which you want to see a list of lifecycle actions.

2. 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.
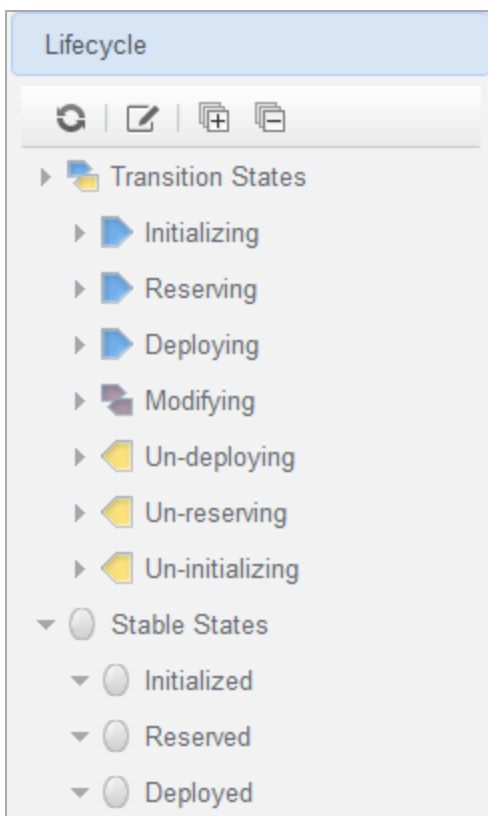
View Properties of a Lifecycle Action for a Resource Offering

For more information about lifecycles, see "Lifecycle Actions for Resource Offerings" on page 191.

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

1. In the **Offerings** tab select the **Display Name** of the resource offering whose lifecycle action properties you want to view.

2. 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 191.

3. Select the lifecycle substate (located directly beneath the lifecycle state diagram), if applicable, that contains the lifecycle action whose properties you want to view.

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

5. 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 201.

Create a Lifecycle Action for a Resource Offering

For more information about lifecycles, see "Lifecycle Actions for Resource Offerings" on page 191.

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 **Offerings** tab select the **Display Name** of the offering for which you want to create a lifecycle action.

2. 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 191.

3. Select the lifecycle substate (located directly beneath the lifecycle state diagram), if applicable, in which you want to create an action.

4. In the toolbar, select the Create (⬚) icon.

5. Provide the information described in the table below.

6. 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 201.

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 (Initialized, Reserved, Deployed). • Visible - When checked, this indicates that the lifecycle action will be available to be run in the Marketplace Portal. The box is checked by default for actions created in stable lifecycle states.
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

Internal Action	Description	Applies To
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
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
Deploy Topology Based Service Component	Initiates the deployment of a delegated topology service component. For more information, see the *Application Deployment on Realized Topology Instance using Sequenced Design* white paper.	• 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

Internal Action	Description	Applies To
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
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

Internal Action	Description	Applies To
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
Undeploy Topology Based Service Component	Initiates the undeployment of a delegated topology service component. The service component must have a property named `topologyId`, with a value that is the id of the topology design to be undeployed. For more information, see the *Application Deployment on Realized Topology Instance using Sequenced Design* white paper.	• Service Component

Delete a Lifecycle Action from a Resource Offering

For more information about lifecycles, see "Lifecycle Actions for Resource Offerings" on page 191.

To delete a lifecycle action from a resource offering

1. In the **Offerings** tab select the Display Name of the offering from which you want to delete a lifecycle action.

2. 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 191.

3. Select the lifecycle substate (located directly beneath the lifecycle state diagram), if applicable, from which you want to delete an action.

4. From the list of actions, highlight the action you want to delete.

5. In the toolbar, select the Delete (✕) icon.

6. 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 191.

To edit a lifecycle action for a resource offering

1. In the **Offerings** tab select the Display Name of the offering whose lifecycle action you want to edit.

2. 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 191.

3. Select the lifecycle substate (located directly beneath the lifecycle state diagram), if applicable, that contains the action you want to edit.

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

5. In the **Summary** tab, you can edit properties as described in the topic "Create a Lifecycle Action for a Resource Offering" on page 195.

6. 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.

7. 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.
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.

Token	Description
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.
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 .

To move a lifecycle action for a resource offering

1. In the **Offerings** tab select the **Display Name** of the offering whose you lifecycle action you want to move.

2. 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 191.

3. Select the lifecycle substate (located directly beneath the lifecycle state diagram), if applicable, that contains the action you want to move.

4. From the list of actions, highlight the action you want to move.

5. In the toolbar, select the **Move** ( ) icon.

6. 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 191.
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 (Sequenced Designs)" on page 181.

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_ TEMPLATE_NAME value to an instance of VMware vCenter.

See the following related topics:

- "View Custom Resource Offering Properties" below

- "Create Custom Resource Offering Properties" below

- "Delete Custom Resource Offering Properties" on page 208

- "Edit Custom Resource Offering Properties" on page 209

View Custom Resource Offering Properties

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

To view custom properties for a resource offering

1. In the **Offerings** tab, click the **Display Name** of the offering whose custom properties you want to view.

2. 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 **Offerings** tab, click the **Display Name** of the offering whose custom properties you want to create.

2. In the **Properties** tab, click the **Create** ( ) icon.

3. Provide the following information:

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 edit this value after the property has been created.

Designs

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. • **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. • **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. The maximum allowed integer value is 2147483647 and the minimum is -2147483648; if you enter a value outside these bounds the value will be automatically converted to the closest maximum or minimum

Item	Description
	value.

For String properties:

- **Name** - A unique name for the property.

- **Display Name** - The display name for the property.

- **Description** - A description of the property.

- **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 204.

To delete custom properties from a resource offering

1. In the **Offerings** tab, click the **Display Name** of the offering whose custom properties you want to delete.

2. In the **Properties** tab, select the custom properties you want to delete.

3. Click the **Delete** (✕) icon.

4. 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 204.

To edit custom properties for a resource offering

1. In the **Offerings** tab, click the **Display Name** of the offering whose custom properties you want to edit.

2. In the **Properties** tab, click the **Name** of the property you want to edit.

3. Edit, as desired. For descriptions of the specific attributes, see "Create Custom Resource Offering Properties" on page 205.

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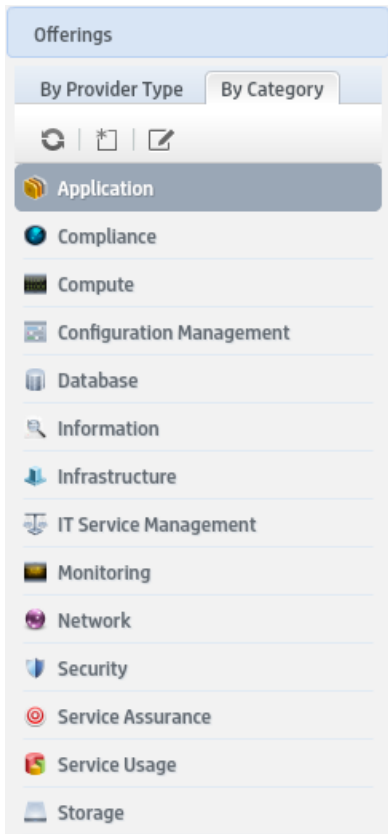
Service components within a service design can accept offering assignments only for those offerings with a category that is supported by the service component type. For example, a **Server** service component can be associated with offerings from a category of *Compute* (among others), while a **Software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

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

View Categories

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

1. Select the **By Category** tab.

2. The categories list is displayed.

Create a Category

For more information about categories, see "Categories" on page 209.

To create a category

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

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

3. 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\standalone\deployments\csa.war\images\library` folder of the HP CSA server.

Delete a Category

For more information about categories, see "Categories" on page 209.

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

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

3. Click the **Delete** (✕) icon.

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

Edit Properties of a Category

For more information about categories, see "Categories" on page 209.

To edit a category

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

2. In the **Edit Categories** properties sheet, click the **Display Name** of a category.

3. For descriptions of the specific properties, see the topic "Create a Category" on the previous page.

Topology Designs

Concepts

Topology designs specify components, relationships, and properties. In contrast to sequenced designs, which more explicitly define the provisioning order and the sequence of actions that will run, topology designs are declarative in nature and do not include explicit actions or sequencing. The provisioning sequence is inferred by the relationships that exist between components in a topology design.

Use topology designs for Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS) deployments that are enabled via Chef, HP Server Automation and HP Operations Orchestration flow-based components.

Each topology design component binds to a single provider for fulfillment automation. Topology designs delegate component lifecycle provisioning to providers.

Configuration

Topology designs that are not based on HP Helion OpenStack® components and HP Helion OpenStack® provider types allow a subscriber in the Marketplace Portal to select an environment (which is a mechanism for grouping providers) and a provider when ordering a subscription. Environments are not mandatory; and if you have a catalog with no environment assigned, provisioning will still work.

If you want the environment and provider to be available for the subscriber to select, the appropriate resource environments must be configured in the **Catalogs** area. For the design to provision successfully, at least one provider for each provider type that is configured in the topology design must be available in any of the environments configured in the catalog.

The subscriber selection works as described below:

- If a subscriber selects **Any Environment**, then a provider that belongs to any of the resource environments configured in the catalog will be selected randomly.

- If a subscriber selects **Any Provider** within a selected environment, then a provider will be selected randomly from all available providers in the selected environment.

If you do not want the resource provider selection option exposed to the subscriber for topology designs that do not involve HP Helion OpenStack®, set the following property in the `csa.properties` file to false:

`OrchestratedTopologyDesignProvisioning.ProviderSelection.Enabled=true`

See the *HP Cloud Service Automation Configuration Guide* for more information about setting this property.

Browse Designs

Concepts

Topology Designs opens showing **All Designs** with tag categories on the left and a list of existing topology designs on the right. The design list can be sorted **By Name** or **Recently Modified**, or click in the **Search** field (🔍) and enter a few characters of a design name.

There can be multiple versions of designs. Versions of a design are grouped and displayed as one entry with links to individual versions.

Tasks

Tasks available from **Designs**:

- **Manage Tags** - Tags are user-defined, color-coded labels and images used to provide a structure for organizing and grouping topology designs. When you select a tag, the designs associated with the tag are displayed. You can optionally apply one or more tags to a design. A pre-created tag labeled **All Designs** allows you to see all designs. You cannot edit, delete, or assign the **All Designs** tag. A design can be assigned to multiple tags.

  Note: Only designs tagged as **Codar Application** are visible when you are licensed to run HP Helion Codar exclusively.

- **Create a design** - Allows you to specify **Name**, **Description**, **Version**, and **Palette**, with additional wizard steps for associating **Tags** and an **Icon** to the design.

- **Import** - Allows you to import designs that were exported as zip archives. Zip archives contain tags and node types in addition to the design.

Topology Design Overview

Concepts

The **Overview** tab provides a summary view of the design details.

Tasks

In the **Overview** tab, you can do the following:

- **Save** a design.

- **Edit** design properties.

- **Save As** - Save the design with a new name.

- **Create New Version** - Allows you to make a copy and assign a new version number to an existing design. For more information, see "Topology Design Versions" on page 220.

- **Publish** the current version of the design so that it can be used to create a service offering.
    - You can publish a design only if it has no validation errors.

    - A published design cannot be modified, but you can use the **Save As** or **Create New Version** functions to create editable designs based on the published design.

    - Partial designs contain capabilities and require composition with a compatible concrete design before they can be provisioned. Partial designs cannot be directly published. These designs are indicated in the **Overview** tab by a **Requires Composition** icon in the upper right of the window.

    - Published designs cannot be unpublished.

    - Only published designs can be exposed to subscribers via service offerings, but you can test deployment of an unpublished design using **Test Run**. See "Testing a Topology Design" on page 221 for more information.

- **Export** the design - The export process takes all the topology files, including the design in XML format, and all the underlying dependencies such as Components and creates a content archive (.zip) file. This zip file can then be imported on the same or a different HP Cloud Service Automation installation. Exporting can also be used for data backup.

- **Delete** - Deletes the selected version of the design.

- **Test Run** - Allows you to test the design directly from the Cloud Service Management Console without having to publish the design or create a service offering. For more information, see "Testing a Topology Design" on page 221.

Best Practices

- Perform **Test Run** before publishing a design.

- Because you cannot edit a published design, use **Save As** or **Create New Version** if you need to modify a published design.

- Deleting a design cannot be undone.

Topology Design Editor

Create a Topology Design

Select Required Characteristics

Concepts

In the **Editor** tab, you design the free-form component layout of nodes and their connections on a grid. A single design normally contains components of multiple provider types (for example. VMware vCenter and HP SiteScope components); however, an HP Helion OpenStack® component can be used only in a design that exclusively contains HP Helion OpenStack® components.

A design based on HP Helion OpenStack® requires you to select a provider instance and resource pool when creating the design. Designs based on HP Helion OpenStack® are IaaS designs only.

Designs not using HP Helion OpenStack® components do not require selection of a provider or resource pool at the time of design creation. Such designs have their resource provider (and resource pool, when appropriate) selected at provisioning time. These designs are composed of VMware vCenter, Amazon, Chef, HP Server Automation, and other custom components. These are IaaS, PaaS, and SaaS designs.

Concrete Components and Capabilities

A component represents one service design element required to realize a service subscription. Components added to the design canvas can be either concrete components, such as vCenter Server, or capabilities, such as Web Server.

When only concrete components are included in a design, those specific components are provisioned. When a design contains a capability, the design can be neither published nor provisioned on its own and requires a separate design, often called an infrastructure design, which contains concrete

components that satisfy each capability expressed in a design. For example, if a design contains a **My App** component that has relationships to **Application Server**, **Database Server**, and **Web Server** (each of which is a capability), a suitable infrastructure design might contain **PHP**, **MySQL**, and **Apache** components. Designs containing a capability cannot be published but can be provisioned by clicking the **Test Run** button and then selecting from one or more candidate infrastructure designs.

Requirements (Required Characteristics)

In the topology **Editor** tab, requirements can be specified on capability components. A requirement allows you to refine which concrete designs should be selected when a partial design is provisioned. For example, Apache Web Server may be a required characteristic that is specified on a Web Server capability, so only designs that contain a component that supports the Web Server capability and has Apache Web Server as a supported characteristic of the component will be selected when a design is provisioned.

Tasks

Designs can be created from the set of topology components that are defined in the **Components** area, and many components are included with HP Cloud Service Automation. If necessary, import any additional components that you need prior to creating a design. For more information, see "Import Components" on page 226.

Add nodes

1. **Select nodes for your design.** As you move your cursor around the canvas in the **Editor**, gray tiles display. Clicking a tile presents a list of available node types to select. The nodes you select can be concrete components or capabilities. Capabilities are clearly labeled in the **Create Node** dialog box and on the design canvas.

2. **Add connectors between nodes to establish relationships.** Connector points are the blue circles that appear when you hover over a node. You can add a connector and a node in a single operation by dragging the blue circle from either side of an existing node and dropping it on the canvas when the connector turns from black to blue. After the drag and drop, only valid nodes display for selection. If you delete a node that has a connector, both the node and the connection are deleted. You can delete a connector without deleting any nodes. Note that capabilities do not support outgoing relationships when included in a design; capabilities support only incoming relationships.

3. **Set property values for nodes and connectors.** In the **Properties** tab, in the right pane of the **Editor**, you can set property values by typing in the corresponding text field.

- Properties on a node can be checked as **Modifiable during service creation** to indicate that the property value can be modified during test run as well as during service ordering.

- Properties on a node can be checked as **Modifiable during service modification** to indicate that the property value can be modified during service modification. This check box is disabled if **Modifiable during service creation** is not selected for this property in the **Properties** tab of the **Components** area.

4. **Select requirements for capability components.** In the **Requirements** tab, in the right pane of the **Editor**, click **Select** to select requirements for a capability component. In the dialog box, you can :

   - Select one or more characteristics from the **Available Characteristics** list, and click **Add**. You can filter the list by **Applicable Characteristics** or by **All Characteristics**. The **Applicable Characteristics** list shows all characteristics supported by all concrete types that have the selected capability as a supported capability. For example, if there are concrete components Apache 2.2 Web Server and Apache 2.4 Web Server that support the Web Server capability, all characteristics supported by those 2 concrete types will be displayed when **Applicable Characteristics** is selected for a Web Server capability.

   - View the list of **Selected Characteristics**, or select one or more characteristics and click **Remove**.

5. **Lay out the design components.** You can drag and drop nodes to change the layout of the design.

6. **Save the design.**

Best Practices

- As nodes and connector properties are validated, you will see red flags or borders as you create a design in the **Editor**. At any time you can view a list of errors in the **"Topology Design Validation" on page 220** tab.

- Partial designs contain capabilities and require composition with a compatible concrete design before they can be published and deployed. These designs are indicated in the **Editor** tab by a **Requires Composition** icon in the upper right of the window.

Topology Design Profiles

Concepts

Profiles are an optional way to override the property configuration of a topology design by setting different values for node properties. Profiles can be created using a saved design with at least one node. Profiles are published automatically with the topology design.

The profiles of a published design can be used to present option sets to the user at subscription time. These option sets are configured when defining an offering based on the published design. 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.

Profiles are validated and tracked in the **Validation** tab. The validation process checks that a profile contains all the required configuration properties for a design.

Tasks

From the **Profiles** tab, you can do the following:

- **Create** a Profile - During profile creation, you can select an existing profile on which to base the new profile. In that case, all settings in the selected profile will be copied into the newly created profile, though these settings can be changed in the new profile. If no profile is selected, then the property settings of the base design will be copied into the new profile. For HP Helion OpenStack® designs, you can select or change the resource pool. Note that the resource pool selection can affect the property values in the profile. If a property value with the same name exists in the new resource pool (e.g., Flavor, Image) it is preserved; otherwise you will be prompted to re-enter properties. Non-HP Helion OpenStack® designs do not require a resource pool selection.

- **Edit** a profile.

Best Practices

You can create as many profiles as needed. You can create a new profile based on an existing profile if the profiles have similar configurations. This process copies all the nodes, connectors, and properties into the new profile where properties can be edited.

Topology Design Validation

Concepts

Validation is a continuing process during design creation, configuration, and editing. Validation ensures that designs and profiles contain all the required configuration properties. Designs with validation errors can be saved but not published.

Tasks

Red validation flags and borders display as you work within topology designs, allowing you to correct errors immediately. Use the **Validation** tab if you want to see all design errors displayed as a list with links to the source.

Best Practices

To avoid validation errors:

- Set properties for nodes and connectors.

- When changing resource pools for HP Helion OpenStack® designs, all dependent properties are re-evaluated. You will be prompted to re-enter if properties become invalid.

Topology Design Versions

Concepts

After you publish a topology design, it can be used to create a service offering and cannot be changed. But you can use **Create New Version** on the **Overview** tab to create a duplicate of the selected design. You assign the new version a unique alphanumeric string separated by a colon, period, or dash. This new version can then be edited and configured as needed; however, the version number cannot be changed. Throughout the topology designs area, version numbers display at the top of the window to the right of the **Name**.

The **Versions** list is sorted alphanumerically and is a read-only view of the version numbers with their creation date and time.

Tasks

After a version is saved, it can be edited, published, and managed just like any other topology design.

Testing a Topology Design

Concepts

Use the **Test** tab to test and manage topology design provisioning without having to publish the design or create a service offering. You can test the following types of topology designs:

- **Partial design** - A partial design is any design that contains capabilities. Such a design cannot be provisioned on its own and requires the selection of a compatible infrastructure design. The partial design and the infrastructure design are then composed to form a composite design, which can then be provisioned. During the test run of a partial design, you will be prompted to select from the list of candidate infrastructure designs, each of which meets the following criteria:

  - Is a concrete design. See definition of **Concrete design** below.

  - Contains concrete components that support each of the capabilities used in the partial design, each of which supports all of the required characteristics specified on the capability in the partial design.

  - Has property values configured for all required properties in the design.

  - Is not a composite design that was created by the combination of a partial design with another concrete design, unless that composite design was subsequently saved as its own design (see the description of **Composite design** below for more information).

  - Has no validation errors.

  For example, consider a partial design that includes a concrete component **My App** with relationships to **Web Server**, **Application Server**, and **Database Server** components.

  Assume the **Web Server**, **Application Server**, and **Database Server** have required

characteristics of **Apache Web Server**, **PHP**, and **MySQL**, respectively.

The partial design could be provisioned with a candidate design (often referred to as an infrastructure design) that contains **Apache 2.4 Web Server**, **PHP 8**, and **MySQL 5.5** components, respectively supporting the **Web Server**, **Application Server**, and **Database Server** capabilities, which respectively support the characteristics **Apache Web Server**, **PHP**, and **MySQL**, with each component configured to be provisioned on a **Server**.

- **Composite design** - The combination of a partial design with an infrastructure design creates a composite design that is itself a concrete design. A composite design is normally hidden from view in the list of topology designs, but it can be made visible by navigating to the **Test** tab of the associated partial design and clicking **Save Design** for the test run that created the composite design. This enables the composite design to be published and exposed to subscribers as a service offering, and also allows selection of the composite design as an infrastructure design when performing test runs of partial designs.

- **Concrete design** - A concrete design is any design that contains no capabilities. Note that a concrete design may include components that support a capability, but a concrete design cannot directly contain capability components (such as Server, Web Server, Application Server, Database Server, and Platform).

- **Infrastructure design** - An infrastructure design is a concrete design that meets all of the needs of a partial design. Because partial designs are generally focused on applications and generally do not contain infrastructure components like Servers, the partial design is sometimes referred to as an application design, while the concrete design it gets deployed with is called an infrastructure design.

Tasks

You can view the following information in the **Test** tab:

- The name of the test run.

- Date and time of the test run.

- Current status of the test run.

- The user who initiated the test run.

You can perform the following tasks in the **Test** tab:

- **Cancel** the realized design so that the instance is terminated. You must cancel before you can delete.

- **Delete** a canceled or failed deployment instance. You must cancel before you can delete.

- **Save Design** - Saves a new composite design, which will appear in the **All Designs** list for topology designs. **Save Design** is available only for partial designs that have successfully completed the **Test Run** process. This functionality is not available in HP Helion Codar.

- **Test Run** button - See Test Run Wizard.

- **Refresh** button refreshes the data in this tab.

You can link to detailed results of test provisioning by clicking the name of the test run. You can see the following information and perform the following tasks:

- **Overview** tab shows details of the test run.
  - **Cancel** the realized design so that the instance is terminated. You must cancel before you can delete.

  - **Delete** a canceled or failed deployment instance.

- **Events** tab shows:
  - **Event Time** - indicates the time the event occurred.

  - **Lifecycle State** - indicates the state of the event execution, for example, Deploying or Undeploying.

  - **Action** - events, such as deployment, server restart, etc., that are executed during the test run.

  - **Source** - the design node that is the source of the event.

  - **Status** - current state of the test run. If you click on an event you see details about the event in the **Overview** tab and property values used in the test run in the **Properties** tab.

- **Topology** tab shows:
  - The topology diagram, properties, status of the test, and an instance summary.

  - Select a server node in this tab to see properties in the right panel and available actions below. You can invoke an action to verify that it is working.

- **Providers** tab shows which provider instances have been used for deployment.

Test Run Wizard

Use **Test Run** on a topology design's **Overview** tab or the **Test** tab to test the design directly from the Cloud Service Management Console without having to publish the design or create a service offering.

The **Test Run** wizard allows you to specify the following:

- **Name** - Type a name or use the system proposed name of `Test run of <design name>`.

- **Profile** (available only for concrete designs) - If you created profiles for the design you can select one, and the test will use the property values defined in the selected profile.

- **Infrastructure Design** (available only for partial designs) - Select a design from the list that, together with the partial design, will form a composite design that can be provisioned. The list displays concrete designs that support all the capabilities and required characteristics in the partial design, as described in the **Concepts** section earlier in this topic.

- **Environment** - You can optionally select an environment to restrict provider selection to only those providers located in the selected environment.

- **Modifiable Properties** - You can change the values of properties that were set as modifiable in the design.

Best Practices

- After deployment cancellation, the test run is still listed in the tab. If you no longer need the entry, you can delete it.

- Select a new name for every test run so you can distinguish between them.

- Test your designs using various deployment scenarios and property configurations to ensure design stability before publishing.

Components (Topology Designs)

Concepts

Use the **Components** area in topology designs to import, create, and configure components. A component represents one service design element required to realize a service subscription. HP Cloud

Service Automation provides a number of out-of-the-box components you can use for creating topology designs.

Concrete Components, Abstract Components, and Capabilities

- Concrete components are the most common components that you will interact with. Concrete components can contain properties, relationships, and operations. Concrete components can express support for capabilities, such as Server, Application Server, Database Server, and Web Server, and can also support characteristics. Concrete components can be included in a design.

- Abstract components provide a base type for other components and can be the target of relationships configured on a component. Abstract components can contain properties and relationships. Abstract components cannot express support for capabilities or characteristics. Abstract components cannot be included in a design.

- A capability is a special type of component that supports properties and relationships (but does not support operations or characteristics). When a concrete component supports a capability, the concrete component inherits the capability's relationships and must provide property mappings from the concrete component properties to the capability properties. Capabilities can be the target of relationships configured on a component. Capabilities can be included in a design, but for such a design to be successfully provisioned, another design must exist that contains a concrete component supporting the capability.

Tasks

You can perform the following tasks in this area:

- **Search for components** - Enter your search string in the **Search** field.

- **Select how to view Components** - Select to view: **By Palette**, **By Tag**, or **By Provider Type**. Click an item in the left pane to see its components displayed in the right pane.

- **Manage tags** - When you are in the **By Tag** view, click the **Manage Component Tags** icon in the lower left pane. Tags are labels that provide a structure for organizing and grouping related items. A component can be assigned to multiple tags.

- **Navigate to component details** - Select a component in the list to see more information about it.

- **Import components** - See "Import Components" on the next page.

Best Practices

If you have a large number of components, use tags to organize them into meaningful groups.

Import Components

Concepts

Importing provides you with the ability to use content from sources external to HP Cloud Service Automation. Importing is the only way to add additional components, as you cannot create components manually.

Importing components is done through an import wizard, with options based on the selected **Import Source** (provider type). The provider types are:

- **Chef** cookbooks - A Chef provider must first be configured in the **Providers** area to enable the import of Chef content. You can select any number of cookbooks, and each cookbook will create one component.

- **HP Operations Orchestration** - Content can be imported from HP Operations Orchestration either in a standard form (known as Standard Content) or a custom form (known as Custom Content). Standard content must follow specific directory and naming conventions to infer the provider type, component name, and version of a created component (with the flow and subflows located under a `Provider Type Name / Component Name / Version` directory). Custom content requires the user to specify the provider type and component name at import time. For more information, see the *HP Cloud Service Automation Topology Components Guide* white paper.

- **HP Server Automation** - An HP Server Automation provider must first be configured in the **Providers** area to enable the import of HP Server Automation content.

The provider type selected above determines the number and order of configurable steps in the wizard.

Tasks

Click **Import** to open the **Import Components** wizard. Following are examples for each provider type:

HP Operations Orchestration Standard Content Example

Complete the following steps for HP Operations Orchestration standard content import:

1. Select **HP Operations Orchestration** as the **Import Source**.

2. Select the appropriate **Source Type** depending on your needs. Import from the live HP Operations Orchestration server integrated with HP Cloud Service Automation or from a standard HP Operations Orchestration content pack. If you select **Content Pack** as **Source Type**, then you must also select a **Content Pack File**.

   NOTE: If you import from a content pack, you will still need to upload the content to the HP Operations Orchestration server integrated with HP Cloud Service Automation.

3. For **Content Structure**, select **Standard Content**.

4. Browse the content and select any number of components you want to import.

   NOTE: Only content that follows the directory structure and naming conventions for standard content will be eligible for selection. For more information, see the *HP Cloud Service Automation Topology Components Guide* white paper.

5. Specify the **Parameter Mapping**. You can select **Use existing Parameter Mapping**, **Create a new Parameter Mapping**, or **No Mapping**. For more information on configuring parameter mapping, see the *HP Cloud Service Automation Topology Components Guide* white paper.

HP Operations Orchestration Custom Content Example

Following are the steps for HP Operations Orchestration custom content import:

1. In the component import wizard select **HP Operations Orchestration** as **Import Source.**

2. Select the appropriate **Source Type** depending on your needs. Import from the live HP Operations Orchestration server integrated with HP Cloud Service Automation or from a standard HP Operations Orchestration content pack. If you select **Content Pack** as **Source Type**, then you must also select a **Content Pack File**.

   NOTE: If you import from a content pack, you will still need to upload the content to the HP Operations Orchestration server integrated with HP Cloud Service Automation.

3. For **Content Structure**, select **Custom Content**.

4. Browse the content and select any number of HP Operations Orchestration flows. All the selected HP Operations Orchestration flows will be used as operations of one created component.

5. Specify the **Parameter Mapping**. You can select **Use existing Parameter Mapping**, **Create a new Parameter Mapping**, or **No Mapping**. For more information on configuring parameter mapping, see the *HP Cloud Service Automation Topology Components Guide* white paper.

6. Specify created component details such as **Component Name**, **Description**, and optionally **Resource Provider Type** if it applies.

Chef Provider Example

Following are the basic steps for Chef cookbook import:

- Set up a Chef server.

- Configure a Chef provider in HP Cloud Service Automation.

- After clicking **Import**, select **Chef** as **Import Source** and **Live instance** as **Source Type**. If multiple Chef providers are configured, select one from the **Provider Instance** dropdown box.

- **Content Selection** - Select one or more cookbooks from the list. Each cookbook will create one component in HP Cloud Service Automation.

HP Server Automation Example

This process is similar to Chef except cookbooks are replaced by policies.

Best Practices

After import is complete, you may need to navigate to the imported component and modify its configuration. For example, you may need to configure operation parameter mapping if **No Mapping** was selected at import time. Or you may need to edit a component to configure tags and custom icons.

Component Overview

You can view a summary of information about the selected component in the **Overview** tab.

Tasks

You can perform the following tasks in this area:

- **View** - See the following component information:
  - **Display Name** - The name displayed for the component.

  - **Description** - The description configured for the component.

  - **Version** - The version configured for the component.

  - **Provider Type** - The provider type configured for the component.

  - **Functional Type** - The functional type can be Abstract, Concrete, or Capability. See "Components (Topology Designs)" on page 224 for more information.

  - **Image** - The image configured for the component.

  - **Tags**- The tags configured for the component.

- **Edit** - The following restrictions apply to the editing of components:
  - You cannot edit a component that is an abstract component, a capability, or an HP Helion OpenStack® component.

  - For some out-of-the-box components, you can edit the **Display Name**, **Description**, **Image**, and **Tags**.

- **Save As** - Save the component with a new **Display Name** and **Description**. **Save As** cannot be used for abstract components or capabilities; it can be used only for concrete components.

- **Delete** - You cannot delete a component that is being used in a topology design. Some out-of-the-box components cannot be deleted.

Component Properties

Create or Edit a Property

Concepts

Properties provide a base set of attributes that can be used and edited when creating components in a service design. They represent configuration settings to be applied to the component during service design provisioning. The value defined for a component property is the default value exposed in the service design.

Tasks

View the following information about the properties:

- **Display Name** - The display name of the property. You can click the property name to open the **Edit** window. An icon next to the **Display Name** indicates that the property can be modified during the modify lifecycle transition phase.

- **Value** - The default value for the property.

Use the corresponding icon or button to:

- See whether the property is **Visible/Invisible** to the subscriber.

- **Show/Hide** the description.

- **Create or Edit a property**
  - You cannot create or edit properties of a component that is an abstract component or a capability.

  - Newly created properties do not automatically affect service designs that have been provisioned. You must manually update any design that uses the component by re-creating the component in the design.

  - For components that are being used in a topology design, you can only add additional properties, and the new properties cannot be **Required**. You cannot modify existing properties, except to change the default values for **Display Name**, **Description**, **Default Value**, and **Can Be Modified**.

Provide the following information for a property:

Item	Description
Type	- **Boolean** - True or False. - **Integer** - A positive or negative whole number or zero. - **List** - A list of string values. - **String** - A sequence of characters.
Name	A unique name for the property. This value cannot be changed after the component is created.

Item	Description
Display Name	The name that displays for the property.
Description	The description that displays for the property.
Resource Type and Unit for a Measurable Property	Available for **Integer** properties only. Select a resource type and unit (other than **None**) to make this property measurable and to enable automatic accounting of resource usage in a provider's resource pool. This field is available for all integer properties on concrete components except for HP Helion OpenStack® components.
Default Value	The default value exposed in the service design.
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.
Visible	Use the check box to indicate if the property is visible in the topology design.
Required	Use the check box to indicate if the property is required in the topology design.

Item	Description
Can be Modified	- Select **No** to specify that the property cannot be modified in the topology design. - Select **Yes (checked by default)** to allow the property to be modified in the topology design and for the **Modifiable during service creation** box to be checked by default in the topology design **Editor**. - Select **Yes (unchecked by default)** to allow the property to be modified in the topology design and for the **Modifiable during service creation** box to be unchecked by default in the topology design **Editor**. - If a property is modifiable in the topology design, then all properties that depend on that property must be modifiable as well. This applies only to HP Helion OpenStack® components. An icon below the **Can be Modified** field indicates that the property can be modified during the modify lifecycle transition phase. This indicates that subscribers can change the property value after the component has been instantiated, and allows the change to be properly reflected when the modify lifecycle transition occurs. For example, the **vCenter Server** component's **cpuCount** and **memorySize** properties can be modified after initial provisioning, allowing a subscriber to change these values during a subscription modify operation. In the Cloud Service Management Console, you cannot configure whether a given property has the capacity to be modified during the modify lifecycle transition phase. Out-of-the-box components have the appropriate setting configured automatically for each of their properties. For components imported from HP Operations Orchestration, the signature of the HP Operations Orchestration flow dictates which properties are marked as being able to be modified during a modify operation. For more information, see the *HP Cloud Service Automation Topology Components Guide* white paper.

- **Delete** the property. You cannot delete properties that are being used in a saved design.

  Note that if you delete a property that supports the modify lifecycle action (indicated by an icon next to the **Display Name** of the property), and you later want to add the property back into the component, you must re-import the corresponding modify lifecycle operation to ensure that the support for the modifiable lifecycle action is restored to the property.

Component Relationships

Create or Edit a Relationship

Concepts

Relationships in topology designs define dependencies between components and also impact how a design is provisioned. For example, imported Chef components require a Server in order to be provisioned. Therefore, all imported Chef components are created with an Outgoing relationship to the Server capability, ensuring that a Server is provisioned before the Chef component.

When importing new components, you may need to define new relationships. Some relationships are created for you automatically at import time, such as the Chef component dependency on Server discussed above. If there are additional dependencies, define them manually in this tab.

Tasks

View the following information about the relationships:

- **Direction** - Outgoing or Incoming.

- **Target or Source Component** - Click the component name of the target or source component to open the **Overview** tab for that component.

- **Display Name** - The display name of the relationship.

Use the corresponding icon or button to:

- **Create or Edit a relationship:**
  - You cannot create or edit incoming relationships.

  - You cannot edit a component that is an abstract component or a capability.

    Provide the following information for a relationship:

Item	Description
Target Component	Select the target component for the relationship from the **Select Component** dialog box, which provides a list of available components.

Item	Description
Display Name	The name displayed for the relationship.
Description	The description displayed for the relationship.
Required Relationship	Use the check box to indicate if the relationship is required in topology designs.

- **Delete a relationship** - Click the delete icon. You cannot delete incoming relationships.

Component Operations

Click a link for information about the following dialog boxes:

Edit Operation

Create or Edit Parameter Mapping

Import an Operation

Tasks

View the following information about the operations:

- **Display Name** - The display name of the operation.

- **Parameters** - The parameters associated with the operation.

Use the corresponding icon or button to:

- See whether the operation is **Visible/Invisible** to the subscriber.

- **Show/Hide** the description.

- **Edit** an operation.

You cannot edit a component that is an abstract component or a capability. Provide the following information for an operation:

Item	Description

General	• **ID** - A unique identifier for the operation. You cannot edit this field.
	
	• **Display Name** - The name that displays for the operation.
	
	• **Description** - The description that displays for the operation.
	
	• **Visible** - Use the check box to indicate if the property is visible in the Marketplace Portal.
	
	• **Lifecycle Action** - Select **(none)** for public actions that will be exposed to subscribers in the Marketplace Portal. Otherwise, select a lifecycle action that will be used during provisioning or de-provisioning:
	  ▪ **Deploy** – Actions specified in this lifecycle phase realize a component during the provisioning of a design that is using the component.
	
	  ▪ **Deploy Failure Handler** – Actions specified in this lifecycle phase handle failures that occur during the execution of the **Deploy** lifecycle phase action on a component as part of provisioning a design.
	
	  ▪ **Undeploy** – Actions specified in this lifecycle phase de-provision a component during the de-provisioning of a service instance that is using the component.
	
	  ▪ **Undeploy Failure Handler** – Actions specified in this lifecycle phase handle failures that occur during the execution of the **Undeploy** lifecycle phase action on a component as part of de-provisioning a design.
	
	  ▪ **Modify** – Actions specified in this lifecycle phase are executed on a component during the modification of a realized component in a service instance, when the service instance is modified by the **Modify Subscription** operation.
	
	  ▪ **Modify Failure Handler** – Actions specified in this lifecycle phase are executed for the cleanup of failed **Modify** actions on a component during the modification of a service instance.
	
	  ▪ **Unmodify** – Actions specified in this lifecycle phase revert the effect of modification on a successfully modified component. This action occurs during the rollback of an unsuccessful overall modification transition of the service instance due to failure occurring on another component that is also subject to modification. The result is that the service instance reverts to the state it was in prior to the modification operation.

Item	Description
Parameters	**Input Parameter Mappings** - The list of input parameters and their configured parameter mappings for this operation. Click the appropriate icon to edit or delete an input parameter. See below for more information about editing. **Output Parameter Mappings** - The list of output parameters and their configured parameter mappings for this operation. Click the appropriate icon to edit or delete an output parameter. See below for more information about editing.

Item	Description

Create or Edit Parameter Mapping	**Create or Edit Parameter Mapping**
	
	To create a parameter mapping, click the **Add Parameter** button just below the **Input Parameter Mappings** or **Output Parameter Mappings** list. Typically, you will add a parameter if the operation is tied to an HP Operations Orchestration flow and you have modified the flow to have new inputs or outputs.
	
	To edit an existing parameter mapping, click the **Edit Parameter Mapping** icon.
	
	• **Name** - A unique name for the parameter.
	
	• **Display Name** - The name that displays for the parameter.
	
	• **Description** - The description for the parameter.
	
	• **Required** - Use the check box to indicate if the parameter is required.
	
	• **Mapping Type** - Select the mapping type for the parameter mapping.
	  ■ **Not Mapped** - Select to provide no parameter mapping.
	  ■ **Component Property** - Select to map the parameter to or from a property on this component. Select the component property in the **Value** list.
	  ■ **Constant Value** - Select to provide a constant value for the parameter. Enter the constant value in the **Value** field. This is not available for output parameters.
	  ■ **Multiple Properties** - Map to multiple properties. Click **Add Parameter** to create additional parameters.
	  ■ **Provider Property** - Select to map the parameter from a property on the resource provider that is used to provision the component. Enter the name of the resource provider property in the **Value** input field.
	  ■ **Relationship Target Property** - Select to map the parameter from a property on a different component that this component has a relationship to. Select the proper relationship in the **Relationship** list, and then select the component property in the **Value** list.

• **Delete** the operation.

• **Import** an operation. You can import an operation, assign a lifecycle action (for example, Deploy or Undeploy), and edit operation parameter mappings. For example, you can import a new HP

Operations Orchestration operation into an existing Chef component. You can import an operation either from an HP Operations Orchestration live instance or from a content pack.

Component Capability

Click a link for information about the following dialog boxes:

Add Supported Capability

Edit Supported Capability

Concepts

The **Capability** tab is visible for concrete components that are not HP Helion OpenStack® components.

See "Components (Topology Designs)" on page 224 for a definition of capability components.

Concrete components can claim support for a capability component. A supported capability includes a reference to the capability component, as well as property mappings between the capability component and the concrete component. A single capability, such as Web Server, can be supported by multiple concrete components; however, a concrete component can only support a single capability.

A capability component can be included in a design to indicate that a concrete component supporting that capability is required in order to successfully provision the design. Designs that include capabilities are referred to as partial designs and require composition with another design in order to be provisioned. For additional information on partial designs, see "Testing a Topology Design" on page 221.

Tasks

View the following information about the capability:

- **Supported Capability** - The display name of the supported capability, if any. Supported capabilities are provided out-of-the-box for some concrete components.

- **Property mappings** - A list of each **Capability Property** and the **Component Property** from which it gets its value.

Perform the following tasks:

- **Refresh** the data in this tab.

- **Add** or **Edit** a supported capability. You cannot add or edit a capability if the component is being used by a topology design. Click **Add Supported Capability** or select a supported capability and click **Edit**. Provide or modify the following information:

Item	Description
Selected Capability	Choose a capability to add to this concrete component. You cannot edit this field after a supported capability has been added.
Property Mappings	For each **Capability Property** in the list, do one of the following: - Select a **Component Property** from which the **Capability Property** gets its value. - Leave the **Capability Property** as **Not Set**. Note that any capability property that has the same 'property Name' as a concrete component property (using a case-sensitive string match) is automatically mapped.

- **Remove** the selected capability. You cannot remove a capability from a component if the component is being used by a topology design.

Component Characteristics

Click a link for information about the following dialog boxes:

Select Characteristics

Manage Characteristics

Create a Characteristic

Concepts

The **Characteristics** tab is visible for concrete components that are not HP Helion OpenStack® components.

Characteristics describe a component and must be used in combination with capabilities. For example, an Apache 2.4 Web Server concrete component may define support for the following characteristics:

- Apache Web Server

- Apache Web Server 2.x

- Apache Web Server 2.4

If this component supports the Web Server capability, a service designer can include a Web Server capability in a design and specify that the design requires the "Apache Web Server 2.4" characteristic. This allows the Apache 2.4 Web Server component (and any other Web Server components supporting this characteristic) to be chosen as part of provisioning the component.

A component should be associated with a capability when supported characteristics are configured. For more information, see "Component Capability" on page 238.

Tasks

View the following information about the characteristics:

- **Supported Characteristics** - See a list of the characteristics supported by the component.

Perform the following tasks:

- **Select characteristics** - Click **Select**. Or, if no characteristics are configured for the component, click **Select characteristics for this component**. See the following table for selection information:

Item	Description
Available Characteristics	Select one or more characteristics in the list, and click **Add**.
Selected Characteristics	View the list of selected characteristics, or select one or more and click **Remove**.

Item	Description
Manage Characteristics	**Create a characteristic** - If this is your first characteristic, click **Create your first characteristic now**. • Provide a **Display Name** for the characteristic. • Provide a **Description** for the characteristic. When characteristics already exist, you can: • Click the create icon to create a new characteristic. • Click the edit icon to edit a selected characteristic. • Click the delete icon to delete a selected characteristic. You cannot delete a characteristic that is a required characteristic in a partial design.

Palettes (Topology Designs)

Concepts

Component palettes provide a grouping structure for components. Each palette contains a group of components, and topology designs are created using a specific palette. You can use out-of-the-box palettes or create your own.

Tasks

After a Palette is created, you can do the following from the **Overview** tab:

- **Save** - Save a palette.

- **Edit** - You can edit global properties, such as **Name** and **Description**.

- **Delete** - Delete a palette.

From within the **Components** tab, you can click a component name to open it for editing. You can also:

- **Remove** selected components from the palette.

- **Add** a component - You can filter the list of available components by **Tag**, **Palette**, or **Provider Type**.

Offerings

Concepts

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.

Types of Offerings

Standard - A Standard offering can be created from a sequenced or topology design. Pricing is configured on a service offering and supports initial, recurring, and option-specific pricing. You can also attach documents to a standard 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.

On the Offerings page, you can browse all service offerings, manage tag categories to organize offerings, and create and import offerings.

Tasks

Specific tasks available on the **Offerings** page are:

- **Manage Tags** - Tags are user-defined, color-coded labels and images used to provide a structure for organizing and grouping service offerings. Once created and associated to an offering, tags display with the offering name in **Browse Designs**. The only pre-created category is labeled **All**, which is where all offerings are stored if you do not create any tags. You cannot edit, delete, or assign the **All** category. An offering can be assigned to multiple tag categories.

- **Create** Offerings - Select a Standard Offering type. See "Create Offerings" for more information.

- **Import** 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. See "Import Offerings" for more information.

You can use the functional area tabs within **Offerings** to configure settings for selected offerings:

- "Overview Tab"

- "Publishing Tab"

- "Options Tab"

- "Pricing Tab"

- "Documents Tab"

- "Screenshots Tab"

- "Versions Tab"

Create Offerings

Concepts

You can create Offerings from the **All Offerings** page.

Tasks

1. From the HP Cloud Service Automation Management Console, click the **Offerings** tile. The All Offerings page opens.

2. Click the **Create** button at the bottom of the All Offerings page. The Create Offering dialog opens.

3. Fill in the Create Offerings fields:
   a. Browse to select a **Service Design**.

   b. Type the display name of the new offering.

   c. Type the version name of the new offering.

   d. (*Optional*) Select an existing offering to use as a template for your new offering in the **Base Offering On** field.

- Browse to select an offering. All configuration settings from the selected offering will be copied into the new offering.

- Click **Done** once you have finished.

e. Type the offering description for the new offering.

4. Select an image to use as the offering icon. HP provides several icons to choose from, or you can import your own.

5. To select an icon from the image library:

a. Click the **Change Image** button.

b. Scroll through the icons in the image library. When you find an icon you like, select it. The selected icon will display a highlighted background.

c. Click the blue **Select** button. Your icon will appear under **Image**.

6. To create a custom icon:

a. Click the **Change Image** button.

b. Click the green **Upload** button.

c. Select an appropriately sized icon from your system, and then click **Open**. Note the following recommendations:

- File type: PNG

- Image size: 256x256

- File size: Maximum 1 MB

d. Click the **Select** button. The new icon appears in the image library for you to select.

e. Select the new image from the image library, and then click **Select** to finish.

7. When you finish, click **Create**. The new offering appears in the All Offerings page list.

Best Practices

You can use the Search function on the **All Offerings** page to find Offerings already created. Click in the **Search** box and input the search string to find a specific offering by version number or name.

Import Offerings

Concepts

Prerequisites for importing an offering based on a topology design

If the imported offering is based on an HP Helion OpenStack® topology design, there are several prerequisite steps:

1. From the Cloud Service Management Console dashboard, click the **Resources** tab and specify an HP Helion OpenStack® Provider.

2. Add the following two properties:
   a. Boolean property: defaultCloudOSProvider=true

   b. String property: defaultResourcePool=<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.

NOTE: Use the **Update** option rather than **Import** when importing an offering based on a sequenced design with delegated topology components.

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**.

Tasks

After selecting **Import**, select an **Option**:

- **Import** - imports new service offerings; does not update existing service offerings.

- **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.

- **Preview** - Used 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.

- **View Detailed Report** - Details about report status, including details about matching and reusing existing artifacts, importing new artifacts, or any missing dependencies that might cause the import to fail. 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.

Best Practices

After importing, you may have to click **All** to view the newly imported offerings if you have a tag category selected.

The archive (`.zip`) file can only reference files or content contained within the `.zip` file itself, or that are already contained in the `csa.war` file. By default, all images in the archive files must end in one of the following suffix values. For information on adding additional suffix values, see the *HP Cloud Service Automation Configuration Guide*.

`jpg|jpeg|jpe|jfif|svg|tif|tiff|ras|cmx|ico|pnm|pbm|pgm|ppm|rgb|xbm|xpm|xwd|png`

Modify Offerings

Concepts

You can modify existing offerings in a variety of ways, starting with clicking the **Edit**, **Save As**, **Export**, **Create New Version**, or **Delete** buttons, at the bottom left of the selected offering page.

For more information about creating new versions, see "Create Offering Versions".

Tasks

To edit, save as, export, or delete an offering:

1. Select an offering.

2. Options:

   a. Click **Edit** to edit the current offering. In the Edit screen you can change the **Display Name**, **Version Name**, **Description**, and **Image** of the offering.

   b. Click **Save As** to create a copy and new version of the selected offering. After you save the new version, you can edit it. For more information, see "Versions Tab".

   c. Click **Export** to export the offering, which sends all files and details related to the offering to a zip file that you can distribute. The Export Zip file appears in the lower left hand side of the screen as a downloadable zip file. In Windows 7, it also appears in your Downloads folder.

   d. Click **Delete** to delete the selected offering.

Best Practices

- Make sure you know the path and file name of the archive file when exporting an offering.

- The 'Save As' option can be thought of as 'cloning' an offering, as only the Offering name can be changed; all other details of the original Offering remain unchanged. The 'clone' offering will also appear with the original offering when you Click on the **Versions** tab.

Create Offering Versions

Concepts

You can create a copy of an existing offering that uses the service design and properties of an existing offering to create a new version. You can view multiple versions of an offering simultaneously, which enables you to visually keep track of offering changes over time.

The **Create New Version** option allows you to select a new service design, name, and version for your offering. You can also optionally utilize configuration migration, using existing offerings as a basis for creating new offering versions by using the **Base Offering On** option.

Tasks

1. Select an offering from the **All Offerings** page list.

2. Click the **Create New Version** button. The New Version dialog opens.

3. Browse to select the **Service Design**, and then click **Select**.

4. Type a new **Display Name** and **Version Name**.

5. (*Optional*) Select an existing offering to use as a template for this new offering in the **Base Offering On** field.

   - Browse to select an offering. All configuration settings from the existing offering will be copied into this new offering.

   - Click **Done** once you have finished.

6. Type the offering version description.

7. If you want to select tags to associate with this offering version, click **Select Tags**, select the desired tags, and then Click **Done** when you are finished.

8. If you want to change the image used as your version icon, click the **Change Image** button, select a new image, and then click **Select** when you are finished. You can also upload an image of your

choice; click the **Upload** button, select the image file which loads into the image library, then click **Select**.

9. When you finish, click **Create**. The new version page opens, allowing the same editing options available for any Offering.

10. When you click the **Versions** tab of the Offerings screen, the new version appears along with other versions of the offering on the **Offering Versions** list.

Overview Tab

Concepts

The **Overview** tab enables you to view and edit details about a selected offering or you may export or delete the selected offering. In addition to the name and description of the offering, you can view the name of the service design used to create the offering and any images and tags associated. You can also create a new version of the selected offering.

Tasks

The following options are available from the **Overview** details page:

- **Edit** - You can edit all attributes of a saved service offering except the service design (sequenced or topology) that was associated during creation.

- **Export** - 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.

- **Delete** - Use caution when deleting service offerings, and understand that service offerings can be deleted even if they are already published to a catalog or are currently in use by active subscriptions. Deleting service offerings used by subscriptions may make resolving of subscription issues more difficult.

- **Save As** - Click **Save As** to create a copy of the selected offering. This option allows you to make a copy, however you can *only* change the name of the new offering.

- **Create New Version** - Create new versions of existing offerings and view multiple versions. For more information, see "Create Offering Versions".

Publishing Tab

Concepts

Offerings are published into one or more catalogs so that they are available in the Marketplace Portal. Offerings can be published into the Global Shared Catalog, which is shared among all organizations, or into an organization-specific catalog. Within a catalog, **Categories** reflect logical groupings of related services.Service offerings can be published more than once in a single catalog provided a different category and approval policy are selected.

Tasks

To publish, complete the following fields:

- **To Catalog** - Select from the list of available catalogs or click **Search** to filter the list.

- **In Category** - Categories are filtered according to your catalog selection.

- **Approval Policy** - Used to configure approvals for public actions that exist in the design that is associated with the offering. Changing the approval policy here does not change the default catalog approval policy. Note that you cannot configure an approval policy for offerings published in the Global Shared Catalog. The default approval policy is **No Approval**. To change, select a policy and use the **Manage Approval Actions** link to view and select from actions offered by HP Helion OpenStack® for components in the design.

Unpublish - 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 clicking **Unpublish**.

Options Tab

Concepts

You can use settings on the Options tab 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 want to expose to subscribers in the Marketplace Portal. Property values within the **Options** tab are populated dynamically according to the provider selected.

The Option Model contains three option sets:

- one with properties

- one for attaching metadata (display name and image) to each possible value of the images property

- one for metadata for the flavor property

Options vary depending on whether a sequenced or topology service design was used to create the offering:

- 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.

- Topology design - **Profiles** are used to override the default configuration by allowing you to set different values for node properties such as flavors, machine images, or keypairs. The **Options** tab indicates if there are any **Profiles** to configure. If there are none, you are setting options for the original design.

Tasks

Within the **Options** tab, you can perform the following tasks. 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 option set name or option name.
👤	Add or update the image associated with the option set or option.
▼	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

Best Practices

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.

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.
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.

User Action	Result
Locks a single option.	Has no effect on any option sets or other options.

Pricing Tab

Concepts

You can set pricing for both options and static properties. Dynamic property values are determined by the provider, e.g., HP Helion OpenStack®.

You can set pricing for the following with up to five-digit precision:

- The base, initial configuration of a service offering, without additional service options.

- Each service option and static properties 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).

- A recurring period and price for a continuing subscription (for example, each week or each month).

Tasks

Enter the following 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

Documents Tab

Concepts

On the Documents tab, you can attach documents of any type to the selected offering, such as service level agreements or terms and conditions. File size per document should not exceed 15 MB and the total size of all documents attached cannot exceed 100 MB.

Tasks

Once a document is added, you have the following options:

- **Visibility** - Click the eye icon if you want this document visible to users in the Marketplace Portal.

- **Delete**

- **Edit Document Name** - The caption defaults to the associated document name but can be edited (including removing the file extension).

Best Practices

- You can add multiple documents at one time.

- You can rearrange the order of multiple documents by dragging and dropping.

- Use **Reset** 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.

Screenshots Tab

Concepts

Screenshots are images and captions associated with a service offering which provide visual representations of the offering's views exposed in the Marketplace Portal. 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.

Tasks

Once a screenshot is added, you have the following options:

- **Visibility** - Click the eye icon if you want this image visible to users in the Marketplace Portal.

- **Delete**

- **Edit Screenshot Name** - The caption defaults to the associated screenshot name, but can be edited (including removing the file extension).

Best Practices

- You can add multiple screenshots at one time.

- You can rearrange the order of multiple screenshots by dragging and dropping.

- Use **Reset** to revert back to any unsaved edits (such as a file name change) or to completely reset the form and clear out all unsaved images.

Versions Tab

Concepts

The Versions tab in Offerings enables you to view and modify multiple versions of an offering.

You can create a copy of an existing offering that uses the service design and properties of the existing offering to create a new version. You can view multiple versions of an offering simultaneously, which enables you to visually keep track of offering changes over time. You can also select options available for utilizing configuration migration into new versions of Offerings.

Tasks

On the Version tab, you can view and modify multiple versions of an offering.You can also use the Versions Edit mode to make a copy of an offering, export an offering to an archive file, update an existing offering, or delete an offering. For more information, see "Create Offering Versions".

Best Practices

You can view multiple versions of an offering. Click on the **Versions** tab, and you will see all the different versions of the offering.

Catalogs

Concepts

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.

You can start using the **Catalogs** area by configuring the automatically created default catalog (Global Shared Catalog) or you can manually create a new catalog and associate it with an organization. Multiple catalogs can be associated with the same organization. Any changes made to the Global Shared Catalog will be visible in every organization's Marketplace Portal. The Global Shared Catalog does not contain **Access Control** or **Approval Policies**, and cannot be deleted or imported.

Tasks

Tasks available:

- **Create** a catalog - Choose the organization the service catalog will be associated with, along with the name, description, and image. Then configure the catalog by providing information in the following areas:

  - "Access Control" on page 260 (not available if you select the Global Shared Catalog)

  - "Approval Policies" on page 260 (not available if you select the Global Shared Catalog)

  - "Categories" on page 265

  - "Offerings" on page 265

  - "Environments" on page 266

- **Import** - The import process imports archives of service catalogs and their supported artifacts, including resource offerings, service offerings, and resource environments. If the catalog already exists,the catalog is updated with any added or removed supported artifacts. Catalogs with the same internal name and organization ID of an existing catalog are considered functionally equivalent and are not imported.

  The archive (`.zip`) file can only reference files or content contained within the `.zip` file itself, or that

are already contained in the `csa.war` file. All images in the archive files must end in one of the following suffix values:

`jpg|jpeg|jpe|jfif|svg|tif|tiff|ras|cmx|ico|pnm|pbm|pgm|ppm|rgb|xbm|xpm|xwd|png`

NOTE: Importing a catalog that has large number of subscriptions with an import option of **Update** can take a long time due to the large volume of data being updated. It is recommended that the import operation be performed during off-peak hours if the catalog contains a large number of subscriptions. This will prevent degradation of subscriber request response time.

Best Practices

During import, you can optionally view a summary and details of the import process, including information about the artifacts and their status. Click on the **Preview** button to view a prospective results report for the import.

Overview

Concepts

The **Overview** tab provides a detailed summary of the selected catalog, including information about access control, default approval policy, and published offerings.

Tasks

Tasks available:

- **Edit** - Allows you to edit the name, description, and image associated to the catalog.

- **Export** - Exporting a service catalog creates a content archive (.zip) file that contains XML documents, associated artifacts, icons for customizing the artifacts, and the Manifest XML document, which contains meta-information about the archive files. If you export the Global Shared Catalog, it will become a non-global catalog.

- **Delete**

Access Control

Concepts

Access Control is used to assign LDAP groups to a catalog. You can choose whether a service catalog is visible to all authenticated users of a consumer organization or just a subset of users.

To make a 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 of the Cloud Service Management Console) 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.

Tasks

Tasks available:

- **Add DN** - LDAP groups need to be configured in the Cloud Service Management Console **Organizations** area. **Add DN** is used to manage access control by adding LDAP groups to the catalog. You can select from existing named DNs or enter your own name for the group or organization unit DN.

- **Edit**

- **Delete**

Approval Policies

Concepts

The Approval Policies area is used to manage approval policies for the selected catalog. This tab is only available when configuring a user-defined catalog (not the Global Shared Catalog).

Approval policies are based on one of four template types (see table below). None of these templates are pre-configured, as they are LDAP dependent. When a catalog is first created, an approval policy is automatically created from the **User Context Template**.

Template Types:

Template Type	Description

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 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.

Template Type	Description

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.
	      ○ 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.

Template Type	Description

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 **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.

Template Type	Description

User Context Template	Use this template to base approvals on LDAP membership settings and structure, as configured in the **Organizations** area of the Cloud Service Management Console.
	
	• 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.

Tasks

Tasks available:

- **Edit** an existing approval policy - All fields are editable except for the **Approval Policy Template**.

- **Delete** a policy - Deletes the policy that the user created, but the template persists.

- **Add** a policy - Enter a name, select one of the four template types, and use the check box if the policy should be automatically approved.

- **Set Default Policy** - The default policy used when publishing service offerings.

Best Practices

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.

Categories

Concepts

Categories are used to group the service offerings in a service catalog. The **Categories** tab provides a way to manage the categories within the selected catalog. This view includes the number of offerings assigned to each category.

Tasks

Available tasks:

- **Add** a category - Provide a name for the new category.

- **Edit** - Allows you to change the **Display Name**.

- **Delete** - You cannot delete a category that has any service offerings assigned.

Offerings

Concepts

The **Offerings** tab shows the service offerings that have been published into the selected catalog,including the date and category. A published service offering displays 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 in the service catalog.

Tasks

Available tasks:

- **Unpublish -** Unpublishing removes the service offering from the category.

- **Change Approval** - Allows you to change the approval policy for a published offering.

- **Link** to the offering - The name of the published offering within **Catalogs** is a link that opens the offering in the **Overview** tab of the **Offerings** tile in the Cloud Service Management Console.

- **Add Offering** - Allows you to add a Service Offering into a Catalog and then Publish it. Choose a Service Offering from **Select Service Offering** list. You can also use the **Search** box to find an individual offering. Then, select a category from the **In Category** dropdown list in which the offering will be published. Optionally, you can select an **Approval Policy** if an offering requires manager approval. After making your selections, Click **Publish** to publish the Offering into the Catalog you are using.

Best Practices

When you click on an individual Offering in CSA Cloud Service Automation, please note that the Cloud Service Management Console will automatically navigate you into *CSA Offerings*. Refer to the *CSA Offerings Help* for more information on managing CSA Offerings.

Environments

Concepts

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.

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.

Tasks

Tasks available:

- View a list of resource environments for the catalog.

- **Select Environments** - Select from the list of **Available Resource Environments** and add or remove them from the **Selected Resource Environments**.

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 page 270
  - "Subscription Overview" on page 275
  - "Transfer Subscriptions" on page 275
  - "View Topology for a Subscription" on page 280
  - "View Providers for a Subscription" on page 285

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.

Item	Description
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 Approval **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 page 268.

For information about viewing subscription details, see "Subscription Overview" on page 275.

For information about transferring subscriptions from one subscriber to another, see "Transfer Subscriptions" on page 275.

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. If the service offering is associated with Global Service Catalog, then the resulting subscriptions will be part of the default catalog for that organization.
Design Name	The name and version number of the design this subscription is created from. (This field is available in the **Overview** tab only.)
Submitted On	The date the subscription was submitted by the Subscriber.

Item	Description
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 280. 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.

Item	Description
	⊖ Canceled - The subscription has been canceled.
	❌ Failed - The subscription was terminated because the deployment failed or timed out.
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 268.

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 270.

See also, "Transfer Subscriptions" below and "Cancel Subscriptions" on the next page.

Transfer Subscriptions

For more information about the **Operations** area, see "Operations" on page 268.

You can transfer subscriptions from one subscriber to another subscriber in the same organization, with the following restrictions:

- You cannot transfer subscriptions that have group ownership.

- 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 268.

You can cancel subscriptions when the service instance status is one of the following:

- Online

- Modification 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 268.

> **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 next page.

Item	Description
Event Time	The time the event occurred.

Item	Description
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.
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 .

> **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. For process IDs that are based on HP Operations Orchestration 10.00 or greater the text in this field will appear as a link, which opens HP Operations Orchestration to the detailed page for the selected process.
Additional Details	Other important information about the event.

View Subscription Event Properties

For more information about the **Operations** area, see .

> **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 268.

> **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:
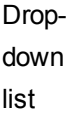
- **Service components** - A service component is defined in the associated service design and may also be created during the provisioning of the subscription

- **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,

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.

Icon	Description
☰	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.

> **Note:** When a timeout occurs during the provisioning or de-provisioning of a subscription that is created from a topology design, the status of the components in the service instance indicates the component status just before the timeout occurred.

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

Icon	Description
	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
	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 268.

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 270.

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**.

HP **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.

Cloud Analytics

Concepts

HP IT Executive Scorecard automatically gathers metrics from HP CSA to build key performance indicators. It provides scorecards and dashboards so that Resource Supply Managers and Service Business Managers have insight into how to measure and optimize the cost, risk, quality and value of IT services and processes.

In HP CSA, the Administrator, Resource Supply Manager, and Service Business Manager roles have access to the Cloud Analytics tile in the dashboard. Clicking on the tile displays the next level of tiles, which are displayed based on user roles:

- Resource Supply Managers see the "Resource Analytics" on the next page tile.

- Service Business Managers see the "Service Analytics" on page 290 tile.

- Service Business Managers see the "Showback Report" on page 290 tile.

- Administrators, Resource Supply Managers, and Service Business Managers see the **Advanced Reporting** tile, which launches a standalone version of HP IT Executive Scorecard in a separate window and allows for more advanced operations, such as running custom reports and drilling down into additional details about information provided in the report.

Tasks

Prerequisites

- You must have HP IT Executive Scorecard installed and properly configured in your HP CSA environment. See the *HP IT Executive Scorecard Administrator Guide* for more information.

- To ensure seamless navigation between the products, make sure that the HP Single Sign-On (HP SSO) for HP IT Executive Scorecard is configured to enable logging on to HP CSA.

- For HP SSO between HP CSA and HP IT Executive Scorecard to work successfully, both products have to be installed on machines that are in the same Domain. The value of Domain and

Protected Domain parameters specified for HP SSO configuration must be the same.

- When configuring HP SSO for HP IT Executive Scorecard the `initString` value must be set as "h/hAjnovyrqlH6gZozDBOpKgMSswHpcva1XH7XwID9M=".

- See the *HP IT Executive Scorecard Administrator Guide* for more information.

To enable HP IT Executive Scorecard tiles in the Cloud Service Management Console

1. Make a backup of the `%CSA_HOME%`/jboss-as`/standalone/deployments/csa.war/dashboard/config.json` file (where %CSA_HOME% is the directory in which HP Cloud Service Automation is installed).

2. Edit the `%CSA_HOME%`/jboss-as`/standalone/deployments/csa.war/dashboard/config.json` file (where %CSA_HOME% is the directory in which HP Cloud Service Automation is installed).

3. Search for a tile called `executive_scorecard`. You can search for this text: `"id": "executive_scorecard"`.

4. Under the `"tiles"` node, enable the first three tiles by changing `"enabled": false` to `"enabled": true`, and disable the fifth tile by changing `"enabled": true` to `"enabled": false`.

5. In the data section for each of the tiles, change `<CONFIGURE_HOST_NAME>` to match the host name of your Executive Scorecard installation.

6. Save and exit the file.

Resource Analytics

Concepts

For more information, see "Cloud Analytics" on the previous page.

Tasks

Click this tile to launch a report that measures the cost and usage of resource providers in HP CSA.

Service Analytics

Concepts

For more information, see "Cloud Analytics" on page 288.

Tasks

Click this tile to launch a report that measures the revenue, cost, and profit margin for business services in HP CSA.

Showback Report

Concepts

For more information, see "Cloud Analytics" on page 288.

Tasks

Click this tile to view a showback report for an organization.

HP Helion Codar

Organizations are facing new challenges when extending continuous integration into continuous delivery. Challenges include consistently deploying applications through development to production environments while considering the differences in those environments.

DevOps provides a framework to bridge the gaps between the development (Dev) and operations (Ops) environments by using a set of principles, methods, and practices around collaboration, automation, and governance. The goal is to extend continuous build or assembly integration to repeatable and consistent application deployment across heterogeneous environments. The following diagram illustrates the continuous integration and continuous delivery cycle in a DevOps environment.
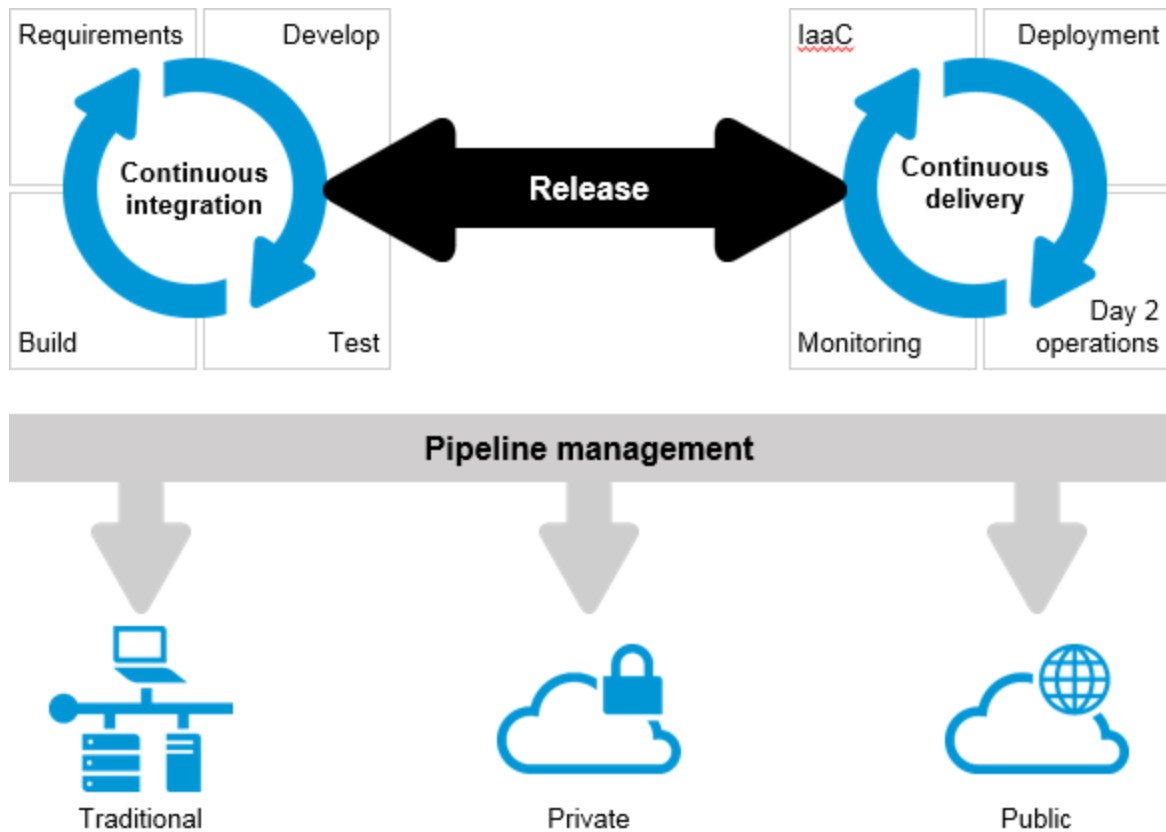
Cloud Service Automation License

License management for HP Helion Codar is the same as for HP CSA. See *Managing the Software License* in the HP CSA section of the online help for more information.

The following license types are available:

- HP CSA permanent license only.

- HP Helion Codar permanent license only.

- Upgrade to HP Helion Codar for an HP CSA installation.

- Upgrade to HP CSA for an HP Helion Codar installation.

- HP CSA & HP Helion Codar license. This license can only be applied if you already have both HP CSA and HP Helion Codar licenses applied, or if you have no license.

If you install HP CSA, then you must add an HP CSA license first; if you install HP Helion Codar, then you must install a HP Helion Codar license first. After you apply a base license, you can add an upgrade license, if desired. If you have licenses for both, you can apply an HP CSA & HP Helion Codar license.

OSI Capacity

The number of operating systems you can use in active applications or subscriptions is known as the OSI capacity.

If you have separate HP CSA and HP Helion Codar licenses, then the OSI capacity is the lowest of the two. If you add a HP CSA & HP Helion Codar license, its OSI capacity is added to the lowest of the two. Here's an example: I have an HP CSA license with 100 OSI and an HP Helion Codar license with 50 OSI, so my OSI capacity is 50. I add a HP CSA & HP Helion Codar license that has a 25 OSI, so my OSI capacity is increased to 75.

Roles in HP Helion Codar

Like HP CSA, organization roles provide authorization for members to perform tasks. These roles are configured and assigned by the administrator.

The Administrator role is the same as that for HP CSA, and users with this role have access to all areas in HP Helion Codar.

Application Architect Role

Users with this role can

- Create packages.

- View packages in any stage.

- Deploy, update, and delete packages in Development stage only.

- Embrace components.

- Create, update, and delete applications and application versions.

Users with this role cannot

- Promote or reject packages in any stage.

Application Developer Role

Users with this role can

- Create packages.

- View packages in any stage.

- Deploy, update, and delete packages in Development stage only.

- Promote packages from Development to Testing stage.

Application QA Role

Users with this role can

- View packages in any stage.

- Deploy, update, reject, and delete packages in Testing stage.

- Promote packages from Testing to Staging stage.

- Deploy, update, reject, and delete packages in Staging stage.

Application Release Manager Role

Users with this role can

- View packages in any stage.

- Deploy, update, reject, and delete packages in Staging stage.

- Promote packages from Staging to Production stage.

- Deploy, update, reject, and delete packages in Production stage.

Summary of Access by Role

The following table shows the predefined roles and the tasks to which each has access.

	Application Architect	Application Developer	Application QA	Application Release Manager
Embrace components	Yes			
View packages	Yes	Yes	Yes	Yes
Create packages	Yes	Yes		
View application and application versions		Yes	Yes	Yes
Create applications and application versions	Yes			
Update applications and application versions	Yes			
Delete applications and application versions	Yes			
Update packages in Development stage	Yes	Yes		
Delete packages in Development stage	Yes	Yes		

Deploy packages in Development stage	Yes	Yes		
Promote packages to Testing stage		Yes		
Update packages in Testing stage			Yes	
Delete packages in Testing stage			Yes	
Deploy packages in Testing stage			Yes	
Promote packages to Staging stage			Yes	
Reject packages in Testing stage			Yes	
Update packages in Staging stage			Yes	Yes
Delete packages in Staging stage			Yes	Yes
Deploy packages in Staging stage			Yes	Yes
Promote packages to Production stage				Yes
Reject packages in Staging stage			Yes	Yes
Update packages in Production stage				Yes
Delete packages in Production stage				Yes
Deploy packages in Production stage				Yes

Reject packages in Production stage				Yes

HP Helion Codar Tag

Tags are used to provide structure for organizing and grouping related designs. When you have a license for HP Helion Codar, a special tag will be added that also helps to control HP Helion Codar-specific designs.

The predefined **Codar Application** tag identifies designs that have HP Helion Codar functionality. For example, the Packages tab is only displayed for designs that have this tag. The tag will not be visible if you do not have a license for HP Helion Codar.

A design with the Codar Application tag can be managed through lifecycle stages from the Packages tab on the design. See .

You can remove this tag from a design if you want to remove its association with HP Helion Codar.

Publish a Design From HP Helion Codar

Publishing a Design

Publishing a design makes it available as an offering to service consumers. You must have an HP CSA license installed before you can publish a design.

A complete design with an active package in the Production stage contains package-specific properties as part of the design and can be published.

A partial design with an active package in the Production stage contains package-specific properties as part of the design, but it cannot be published until a final composed design is created by deploying the production package.

Publishing a partial design is different depending on which licenses you have installed:

- An HP Helion Codar application design that has been advanced to the Production stage is deployed on a production infrastructure, and then the composed production design is made visible on successful production deployment. The design can then be published to service consumers.

- A design that is not an HP Helion Codar application design must be saved as a composed design from the Test tab. The design can then be published to service consumers.

The following figure illustrates the process:
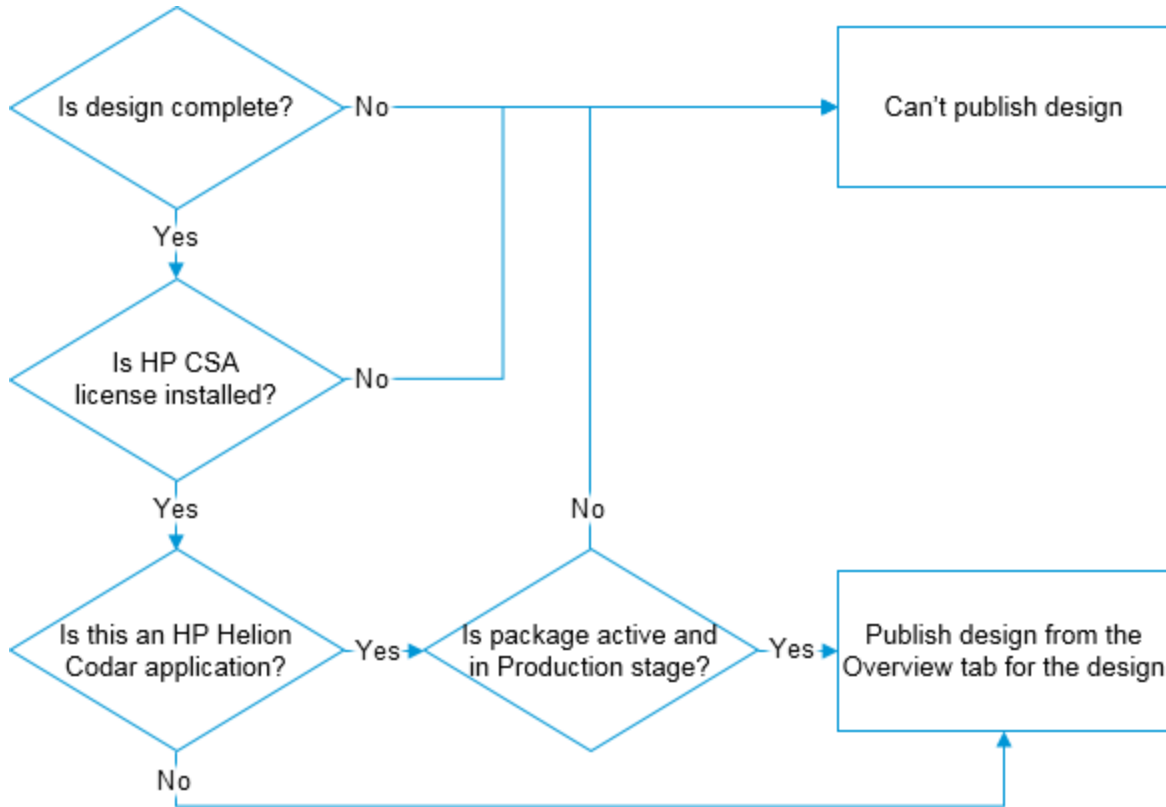
To publish an HP Helion Codar design

1. Go to the Overview tab for the design.

2. Click **Publish**.

Packages

Packages represent a snapshot of an application design and allow properties to be parameterized within the design. We can also say that the package represents a particular build of an application.

It is the smallest unit that can be deployed for an application. It represents both the implementation artifacts (the manner in which an application should be deployed) and deployment artifacts(the location

of libraries like war, ear, etc., that should be deployed). From the HP Helion Codar perspective, a package comprises the following features:

- You can create a package from a specific application version. An application version can consist of multiple packages. See "Create a Package" on page 300.

- Packages can be deployed. In this case the corresponding state of an application design along with the properties of the design specified in the package will be fulfilled. See "Deploy a Package" on page 301.

- Packages are associated with a lifecycle stage. A package can belong to Development, Testing, Staging, or Production stages.

- Packages are associated with pipeline management. They can be moved across lifecycle stages through promotion. For example, a user with the QA role can reject a package. See "Lifecycle States, Stages, and Actions" below.

- Packages in production can be published as offerings. See " Publish a Design From HP Helion Codar" on page 296.

Lifecycle States, Stages, and Actions

Packages have the following lifecycle stages and corresponding actions:

Stage	Promote	Deploy	Edit	Delete	Reject	Refresh
Development	Yes	Yes	Yes	Yes	No	Yes
Testing	Yes	Yes	Yes	Yes	Yes	Yes
Staging	Yes	Yes	Yes	Yes	Yes	Yes
Production	No	Yes	Yes	Yes	Yes	Yes

Note: You may not have access to some or all of this functionality, depending on your role. See Roles in HP Helion Codar for more information.

You can find the lifecycle stages on the Packages tab, and the current stage and state is shown on the Overview tab for a design.

Use the following actions to deploy or move a package through the stages:

- **Promote**: Moves the package to the next lifecycle stage. The package state remains Active.

- **Deploy**: Deploys the package. See "Deploy a Package" on page 301.

- **Edit**: Change the properties of a package. See "Edit a Package" on the next page.

- **Reject**: Stops the package from advancing to another stage. The package will remain in its current stage, its state will be set to Rejected, and the action buttons will no longer be available.

- **Delete**: Delete a package.

- **Refresh**: Retrieves current package status.

Package States

Packages have the following states:

- Active

- Rejected

If you reject a package, then it remains in its current stage, its state is set to Rejected, and no further actions can be applied.

When a package is promoted, it moves to the next stage and remains in the active state. Packages are always created in the Development stage. If the HP Helion Codar Jenkins plug-in is configured, then after a successful build the Jenkins plug-in talks to HP Helion Codar and creates a package. Packages will be in the Development stage. The package get deployed based on the environment configured in the Jenkins plug-in.

View Packages

For more information about packages, see "Packages" on page 297.

To view packages

Click the Packages tab for a service design. The list of packages for that design will be displayed. This tab is only visible if you have a license for HP Helion Codar.

Use the search box on the right to find a specific package. Filter packages by stage and state using the drop-down lists on the left.

Packages are grouped into stages, with three packages displayed per stage initially. Click More to the right of the stage heading to view all packages for a certain stage. For more information about stages, see "Lifecycle States, Stages, and Actions" on page 298.

Create a Package

For more information about packages, see "Packages" on page 297

Note: You may not have access to some or all of this functionality, depending on your role. See Roles in HP Helion Codar for more information.

To create or edit a package

1. Select the Packages tab for a service design. The list of packages for that design will be displayed.

2. Click **Create**.

3. Enter a name and description.

   The application design and version are displayed, but cannot be changed.

4. Click **Create**. A package will be created in the Development stage.

For more information about the package lifecycle, see "Lifecycle States, Stages, and Actions" on page 298.

Edit a Package

For more information about packages, see "Packages" on page 297

You can edit a package name and description. For information about changing a package state or stage, see "Lifecycle States, Stages, and Actions" on page 298.

Note: You may not have access to some or all of this functionality, depending on your role. See Roles in HP Helion Codar for more information.

To edit a package

1. Click the Packages tab for a service design. The list of packages for that design will be displayed.

2. Click on a package in the list. If you don't see the package you want to edit, see "View Packages" on page 299.

3. Click **Edit**.

4. Change the package name or description.

5. Click **Save**.

Configure Package Properties

The Configure tab for a package allows you to change all required properties and properties that can be modified for all components used in the design.

To configure package properties

1. Select the Configure tab.

2. Change the desired properties.

3. Click **Save**.

Deploy a Package

For more information about packages, see "Packages" on page 297.

> Note: You may not have access to some or all of this functionality, depending on your role. See Roles in HP Helion Codar for more information.

To deploy a package

1. Click the Packages tab for a service design. The list of packages for that design will be displayed.

2. Click **Deploy** to the right of the package.

3. Enter a name for the deployment.

4. Select an environment for the deployment.

5. (Optional) Click Modifiable Properties to change properties for this deployment.

6. Click **Deploy**.

Deployments Tab

After a package has been deployed, an entry is made on the Deployment tab for the package. This tab lists all deployments, their status, and the user who created the deployment. Click a deployment for quick access to the test results for a deployment.