HP Cloud Service Automation

Application Deployment on Realized Topology Instance using Sequenced Design

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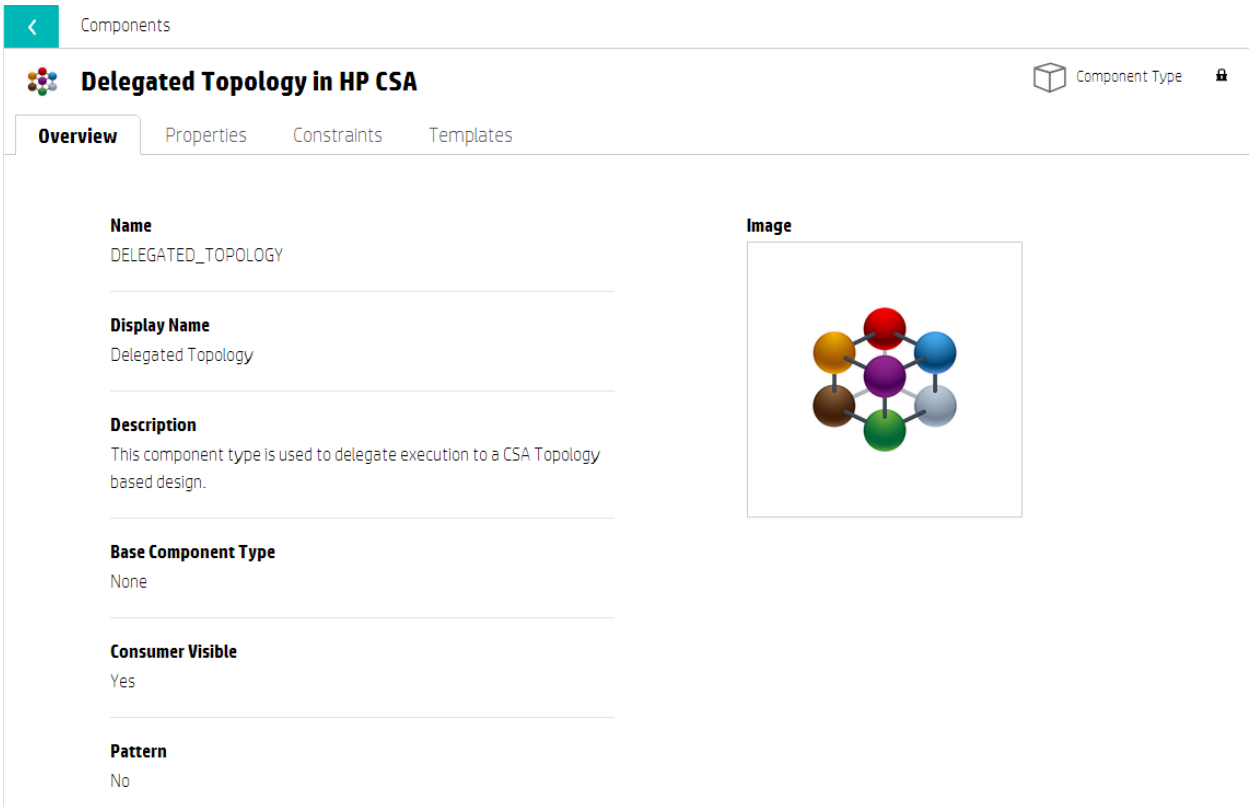
Overview

Topology designs based on the HP Helion OpenStack® provider lack the capability to deploy applications on realized topology instances. This document provides details on how to deploy applications on realized topology instances based on the HP Helion OpenStack provider using the sequenced designer, and describes a new component that “delegates” to a topology design when the service is realized.

A new DELEGATED_TOPOLOGY component is introduced in the Sequenced Component palette, which is used to represent the topology design in the sequenced model. The service offerings need to be created only for the sequenced designs and not for topology designs. The Delegated Topology component has internal lifecycle actions for deploy and undeploy to help realize the topology design.

Delegated Topology component

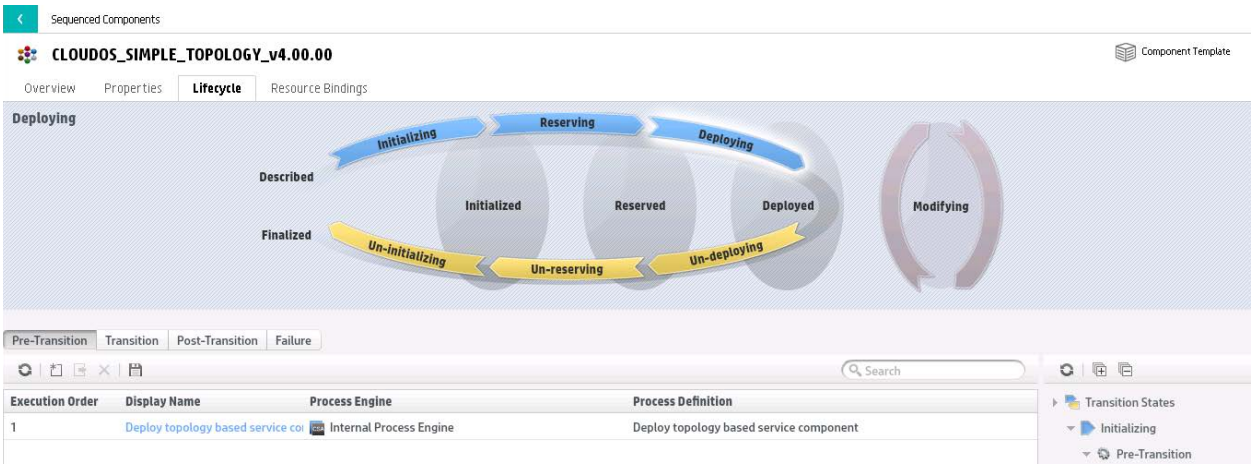
This is a new component available Out of the Box (OOTB) with HP Cloud Service Automation (HP CSA) 4.01 and above. This component type is used to represent the topology design in the sequenced design as a composite component. When an existing HP CSA instance is upgraded to 4.01 or higher, a Delegated Topology component is created for each of the topology designs that already exists.



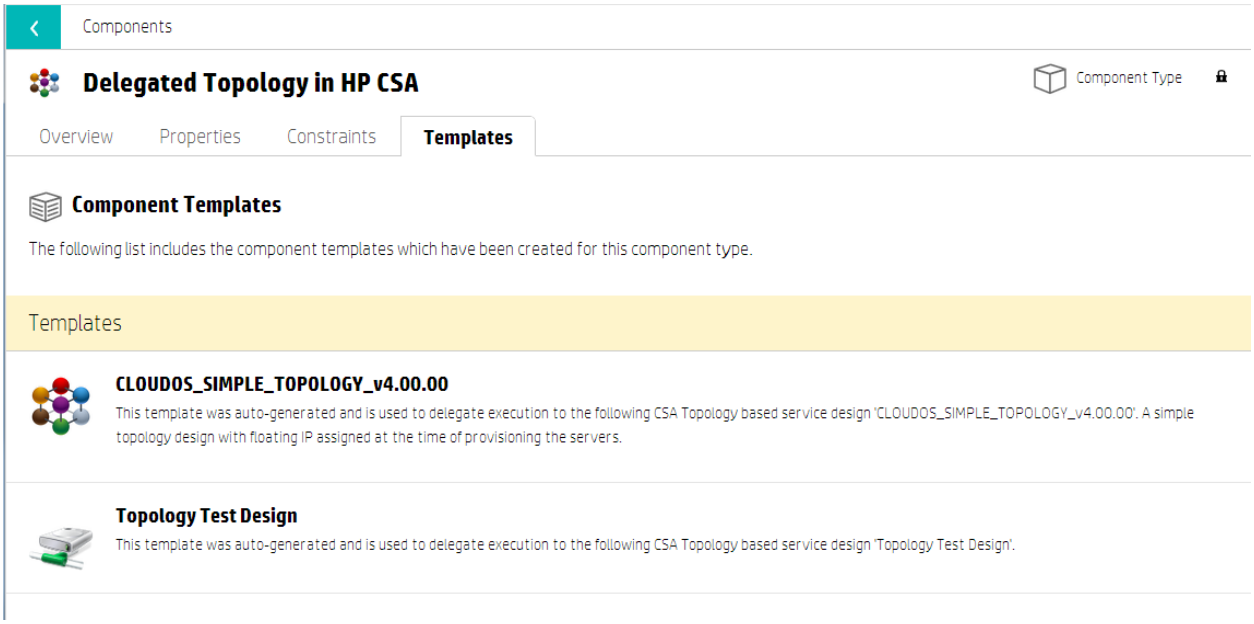
The following are the lifecycle actions that the Delegated Topology Component includes:

- Deploy – lifecycle state - DEPLOYING, lifecycle substate – **PRE-TRANSITION**
- Undeploy – lifecycle state - UNDEPLOYING, lifecycle substate – **PRE-TRANSITION**

Note: All the lifecycle actions specified in the DEPLOYING and UNDEPLOYING lifecycle states must be specified in the PRE-TRANSITION state; otherwise, if failure occurs in any of those actions, the subscription may end up with the state 'Pending'.



A component template (DELEGATED_TOPOLOGY type) is automatically created whenever a new topology design is published, and this template can be used in sequenced designs to realize the specific topology. This template contains the lifecycle actions for deploy and undeploy along with the defined properties - **profile** and **topologyId**. This template cannot be modified or deleted by the service designer.



Note: During the upgrade from HP CSA 4.00 to a higher version, delegated topology component templates are created for each of the existing topology designs created in HP CSA 4.00.

The Delegated Topology Component template will be updated when the topology design is updated for properties, such as **Name**, **Display Name**, **Icon**, and **Description**.

When the topology design is cloned, a new delegated topology component template is created automatically.

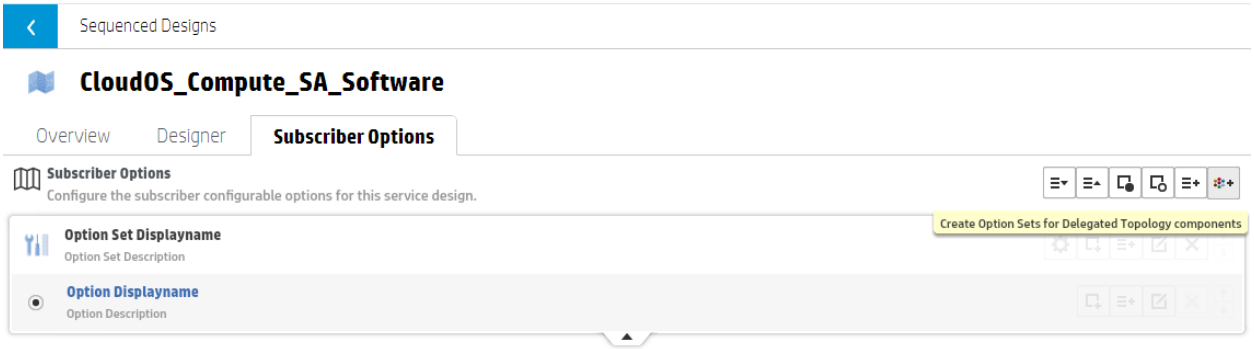
When the topology design is deleted, the delegated topology component template for that design is also deleted.

The topology design cannot be deleted when its delegated topology component template has been used in any of the sequenced designs. If you try to delete the topology design, it will cause an error.

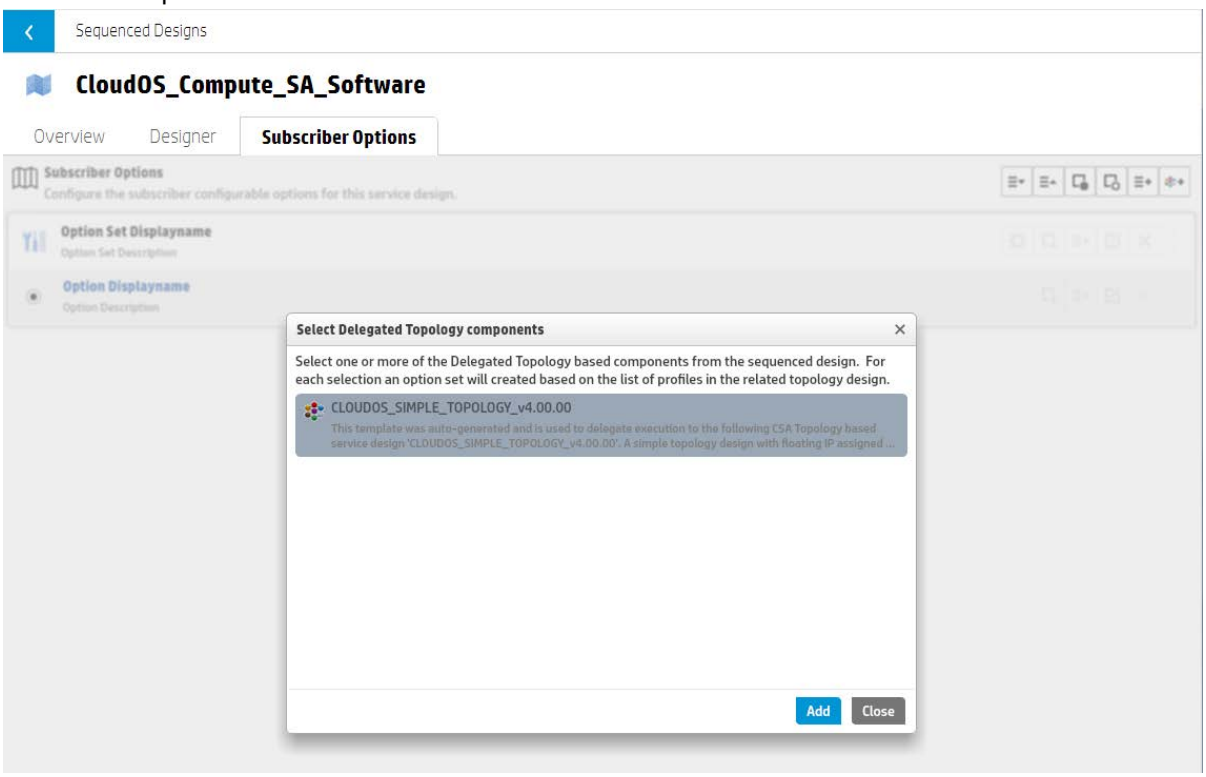
Subscriber options

The topology design profiles are represented in the sequenced design as subscriber options, using the option set when the Delegated Topology component is used.

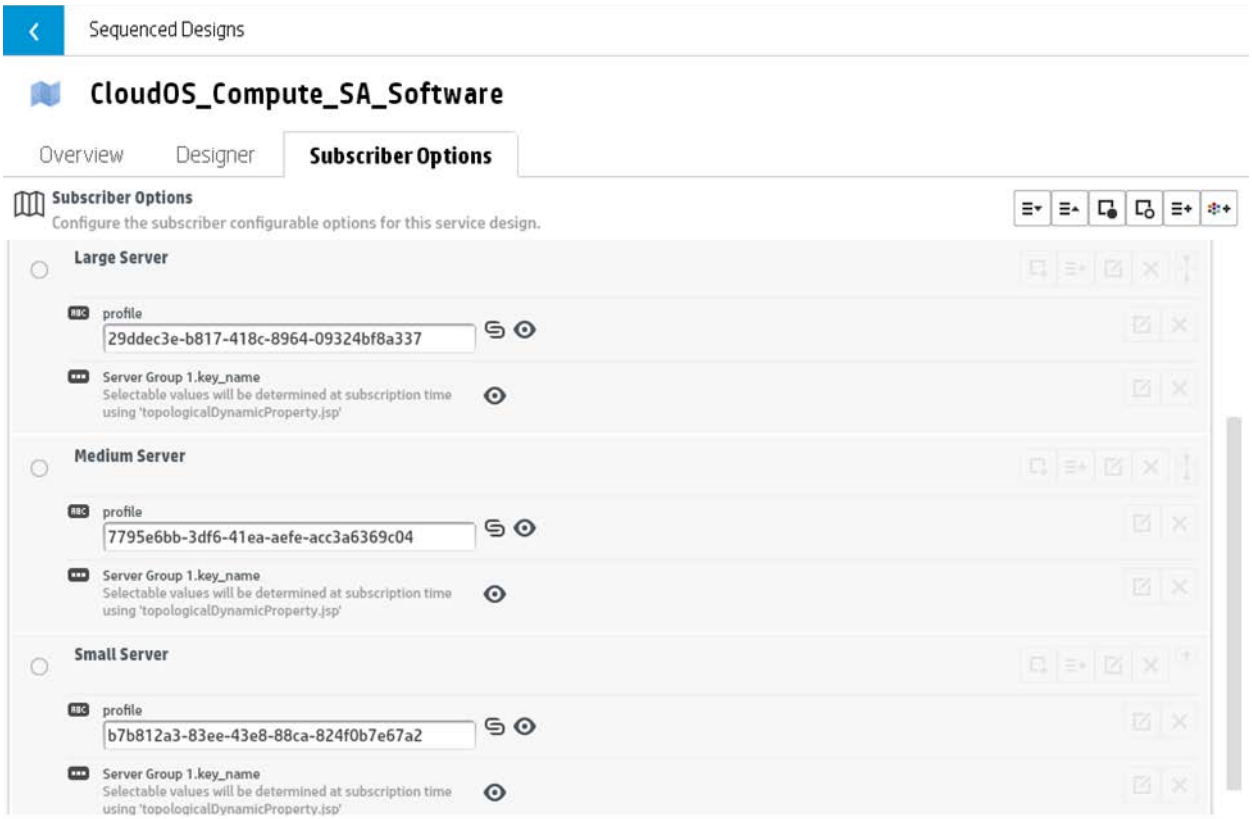
When the sequenced design contains the Delegated Topology component, there will be a button to Create Option Sets for the Delegated Topology component.



When the option is selected, it will pop up a new dialog for selecting one or more of the Delegated Topology components used in the sequenced design. This is a multi-select list; use the **Ctrl** or **Shift** key to make multiple selections.



For each selected Delegated Topology component, an option set will be created based on the list of profiles in the respective topology design.



For each selected item in the dialog box, an Option Set is added in the sequenced design subscriber options. Each option set contains an option per profile in the topology design, and each option contains the list of modifiable properties from that profile.

Note: For HP Helion OpenStack based designs, the **Server Group.key_name** property is made available with each profile and is not present in the topology design property list; it has to be the Key Pair name used to connect to the realized HP Helion OpenStack instance.

Service offering creation

A service offering can be created from a sequenced design, which contains a delegated topology component, only if the corresponding topology design has been published. If the underlying topology design is not published, an error will be reported when the service offering is created. When the service offering is created from a sequenced design that contains a Delegated Topology Component, additional validation is performed to ensure that the Option Set defined for each Profile Configuration in the underlying topology design is still accessible, since it is possible to modify the Topology Profile Configuration independently until the design is published. If it is found that an Option Set is missing the corresponding Profile Configuration, then the Option Set will be removed. Similarly, if an Option Property is not found in the corresponding Profile Configuration then that Option Property is removed. When such discrepancy is detected and adjustments are made, a warning message is logged in the HP CSA log file reporting what kind of adjustments were made.

Import/Export of service designs

In this approach, there will be a sequenced design and topology design created. Each of these designs has to be exported individually to a separate archive file, via a separate export operation.

When importing the service designs, the sequenced design has a dependency on the topology design; hence, the topology design has to be imported prior to the sequenced design as a separate import operation. During import of a sequenced design that utilizes a delegated topology component, the corresponding topology design must exist on the target system and must have the same display name as that referenced in the delegated topology component.

If the topology design does not exist, then the sequenced design import will fail with an error. The **Preview** option can be used during the import operation to determine whether the sequenced design import will succeed and to determine if all the dependencies are resolved.

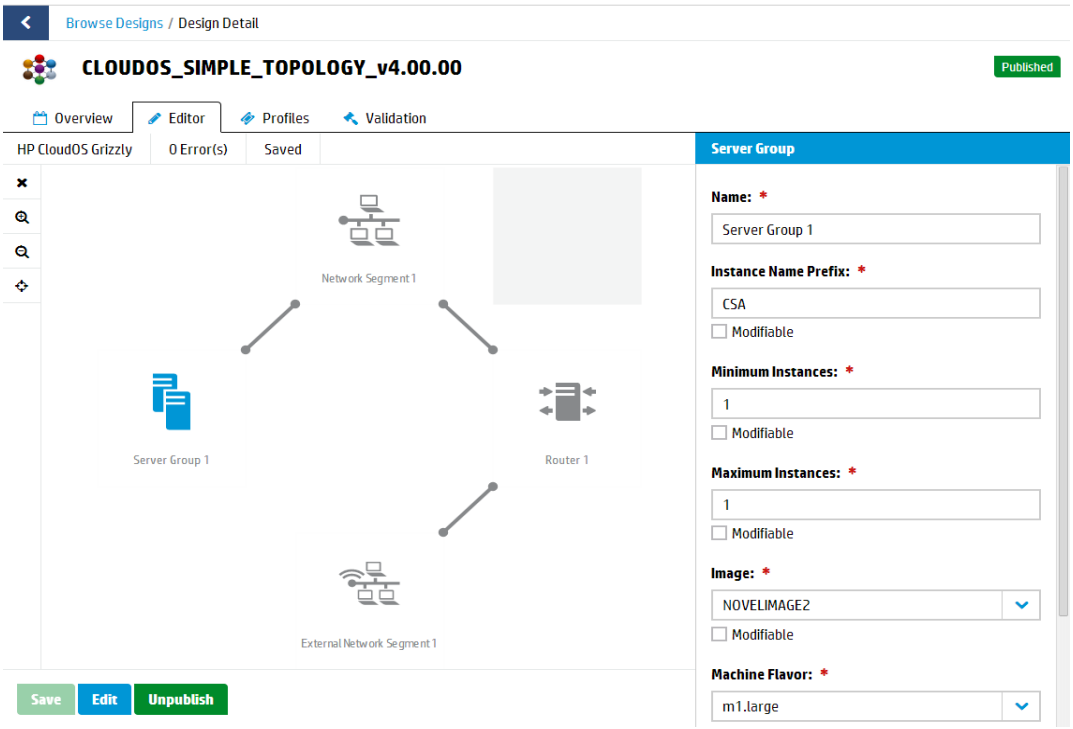
The catalog import containing the Delegated Topology component will fail because the topology designs are imported last. Hence, the topology design has to be imported separately before importing the catalog. As a result, when the catalog is imported it will re-use the previously imported topology design, instead of attempting to re-import them.

Out-of-the-box content for HP Helion OpenStack based topology design

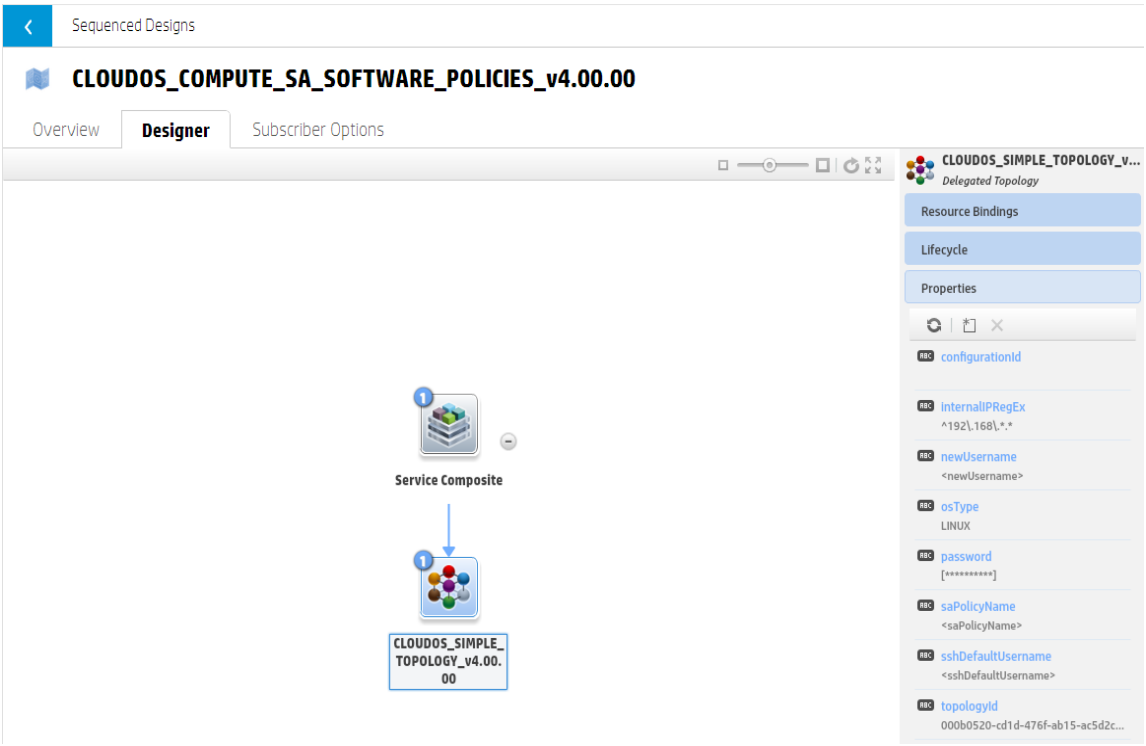
HP CSA provides OOTB service designs and resource offerings that demonstrate the capability to deploy applications with topology designs using the sequenced designs.

The following are the OOTB contents;

- OOTB Topology Design – includes Server Group, Network Segment and Router



- OOTB Sequenced Design – includes a service composite and Delegated Topology component of the OOTB topology design.



- The following are the properties for the OOTB service design.

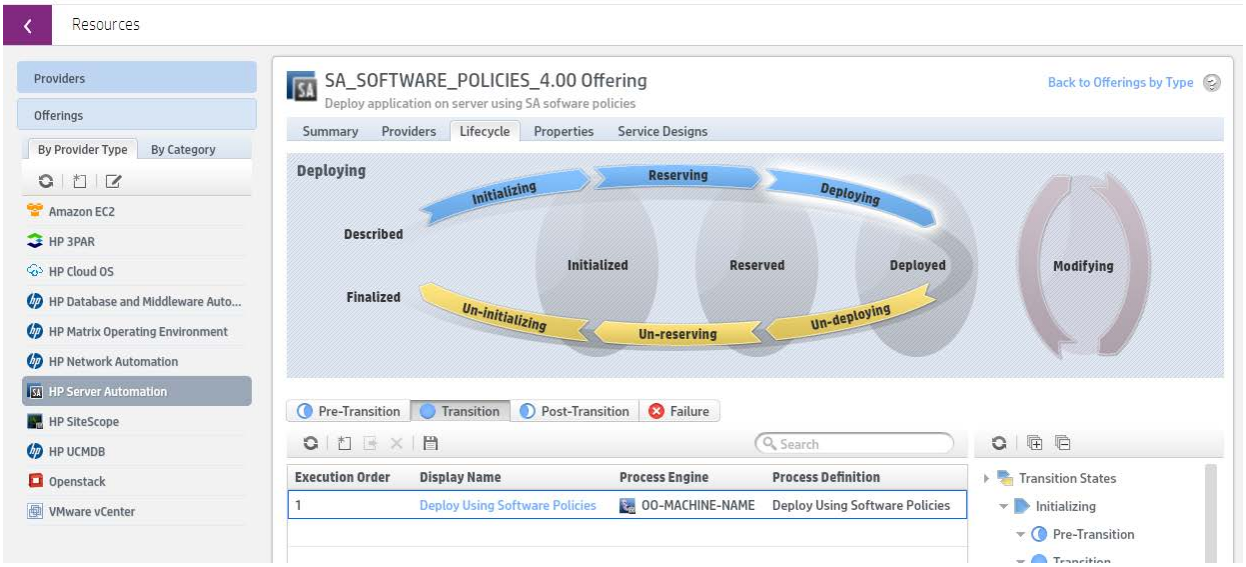
Property	Description
configurationId (profile)	Internal property, used to store topology profile id
InternalIPRegEx	Identifies the internal IP Address on the topology instance
newUserName	User login name to be created on the topology instance
password	Password for the user login
osType	Operating System Type – LINUX
saPolicyName	Software Policy Name in HP Server Automation to be deployed
sshDefaultUsername	Default User Name for SSH Login
topologyId	Internal property, ID of the topology gets assigned automatically from the component template

- The **configurationId** and **topologyId** are filled in by default with the component template you choose; do not change those values.

OOTB Resource Offering for Application Deployment

There are two new Resource Offerings available OOTB.

- **SA_SOFTWARE_POLICIES_4.00** – deploys the application on the HP Cloud OS instance using HP Server Automation (HP SA) and works with realized topology instances.
- **SA_MANAGE_TOPOLOGY_SERVERS_4.00** – manages the HP Cloud OS instance into HP SA.



These resource offerings have to be associated to the Delegated Topology component using the Resource Binding option.

All the realized server instances of the topology design referenced by the Delegated Topology component will be considered as server components on which the resource offering will operate. If there are multiple tiers in the topology design, they are considered to be a single group of realized server instances.

Note: The **Server_Group.key_name** on the Delegated Topology component profile is used as the key pair name to connect to the realized HP Helion OpenStack instance to deploy the application.

Prerequisite

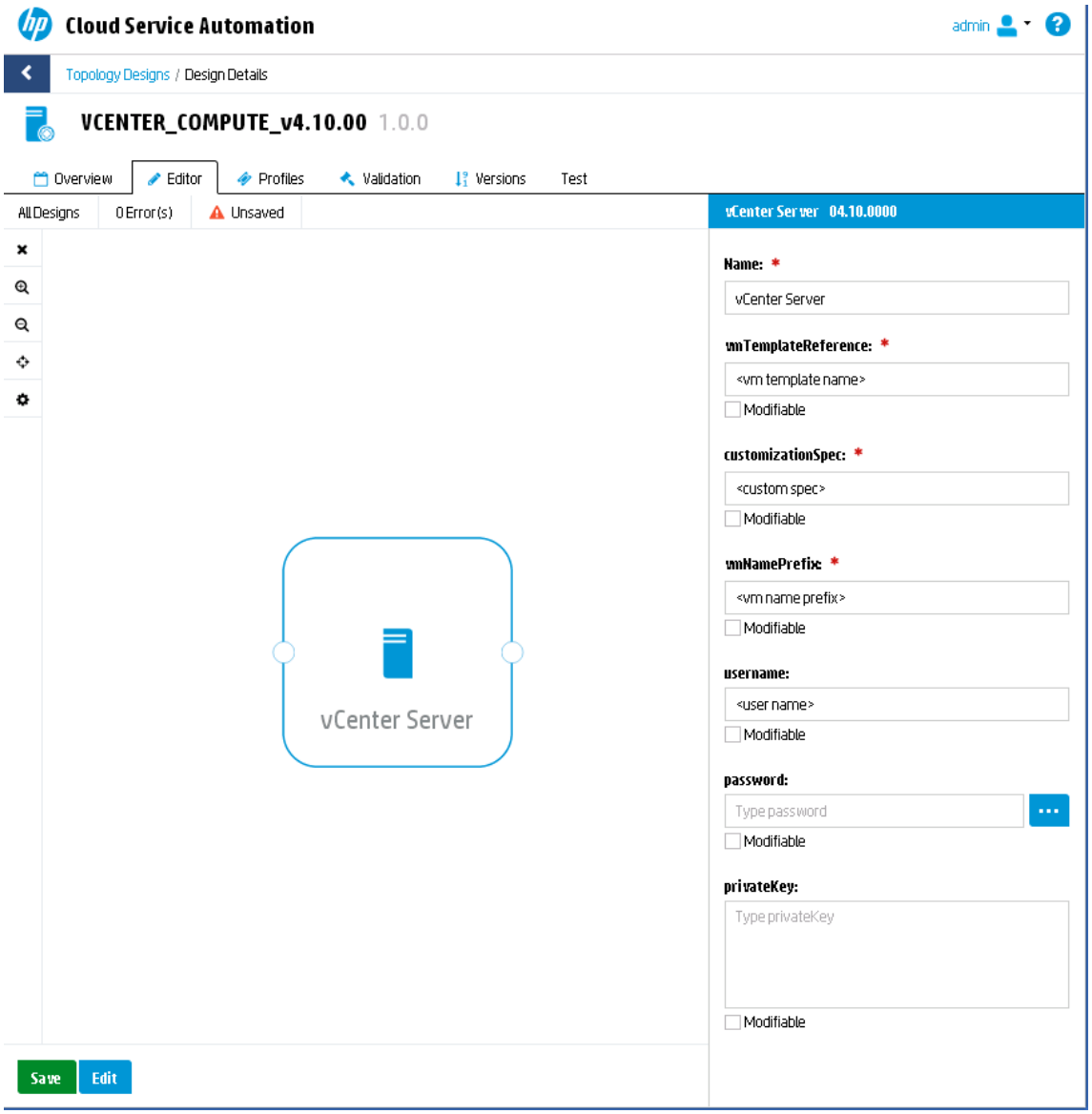
The following are the prerequisite to use the OOTB Contents

1. The OOTB Resource offering is available only for the HP Server Automation (HP SA) provider. HP SA must be installed and configured before you can use it to deploy applications.
2. Software Policies should be preconfigured on HP SA.
3. The HP SA server should be reachable by the HP Helion OpenStack private network.

Out-of-the-box content for topology designs based on vCenter provider

Use Case 1: Deploy Infrastructure from topology design. Deploy application and flex actions from sequenced design using HP Server Automation.

Topology OOTB design CSA_BP_VCENTER_COMPUTE_v4.10.00 includes a single VMware vCenter server component



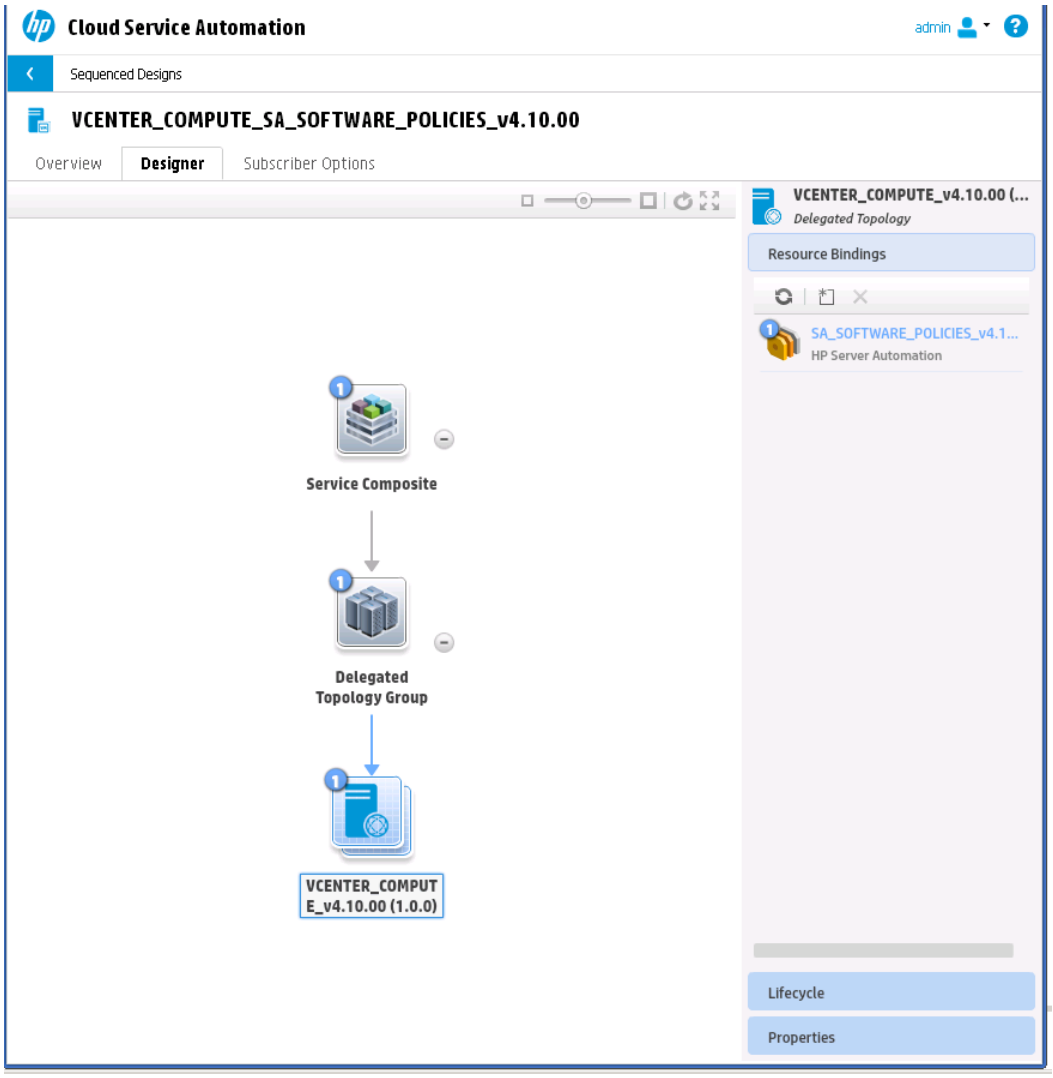
VMware vCenter Server component properties

Property	Description
Name	The name of the server component

vmTemplateReference	The VM template name to be used to deploy the new instance. This template has to be HP SA sanitized.
customizationSpec	The vCenter custom spec to be used
vmNamePrefix	The prefix of the final VM instance name
Username	User name to connect to the instance
Password	The password in case plain password authentication is enabled on the instance
privateKey	The SSH key pair content in case keypair based authentication is enabled on the instance.

Note: Since this OOTB design depends on the HP SA sanitized template, the username, password, or the private key properties are optional and can be left empty.

Sequenced OOTB design CSA_BP_VCENTER_COMPUTE_SA_SOFTWARE_POLICIES_v4.10.00 includes Service Composite, Delegated Topology Group and Delegated Topology and a Resource offering attached to the Delegated Topology to deploy the software.



The following are the properties of the service design.

Design Components:

1. Delegated Topology Group

Property	Description
topologyCount	This value determines the number of times the topology design will be realized.

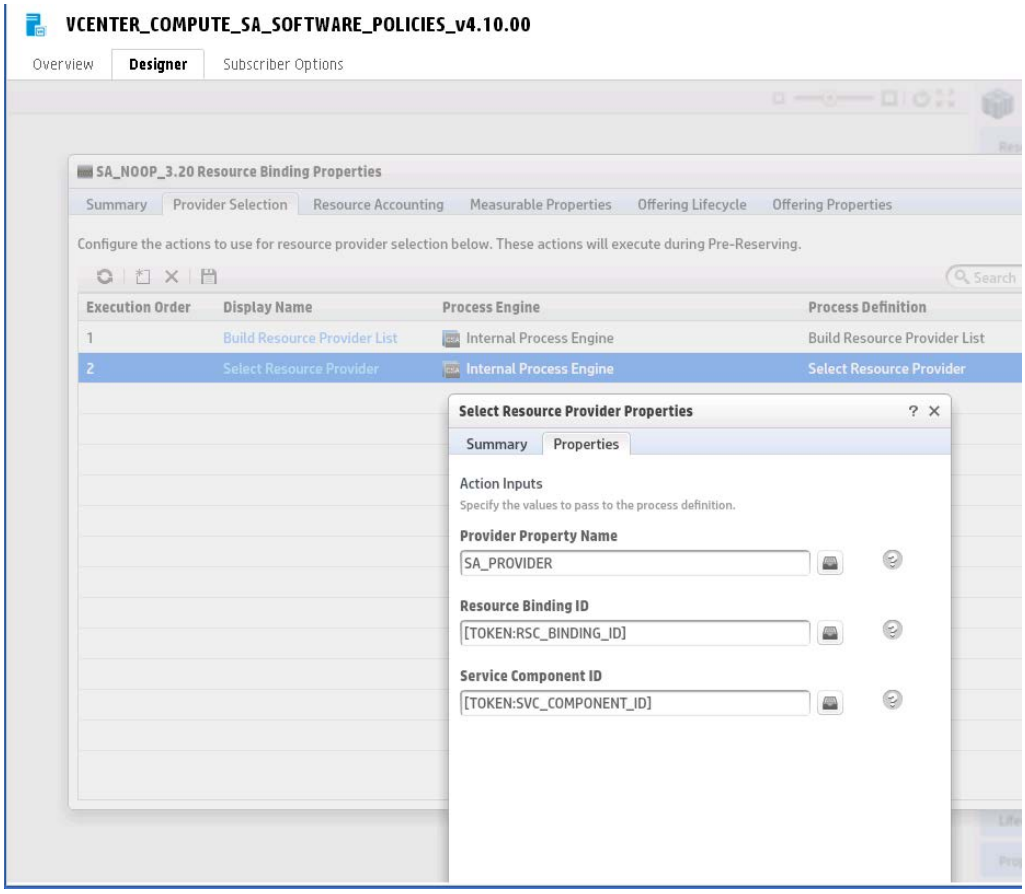
2. Delegated Topology Template (VCENTER_COMPUTE_v4.10.00):

Property	Description
configurationId (profile)	Internal property, used to store topology profile id
topologyId	Internal property, ID of the topology gets assigned automatically from the component template
swPolicyNames	Comma separated list of HP SA software policy names that will be deployed on the realized instances.

Resource Offerings:

1. SA_NOOP_3.20

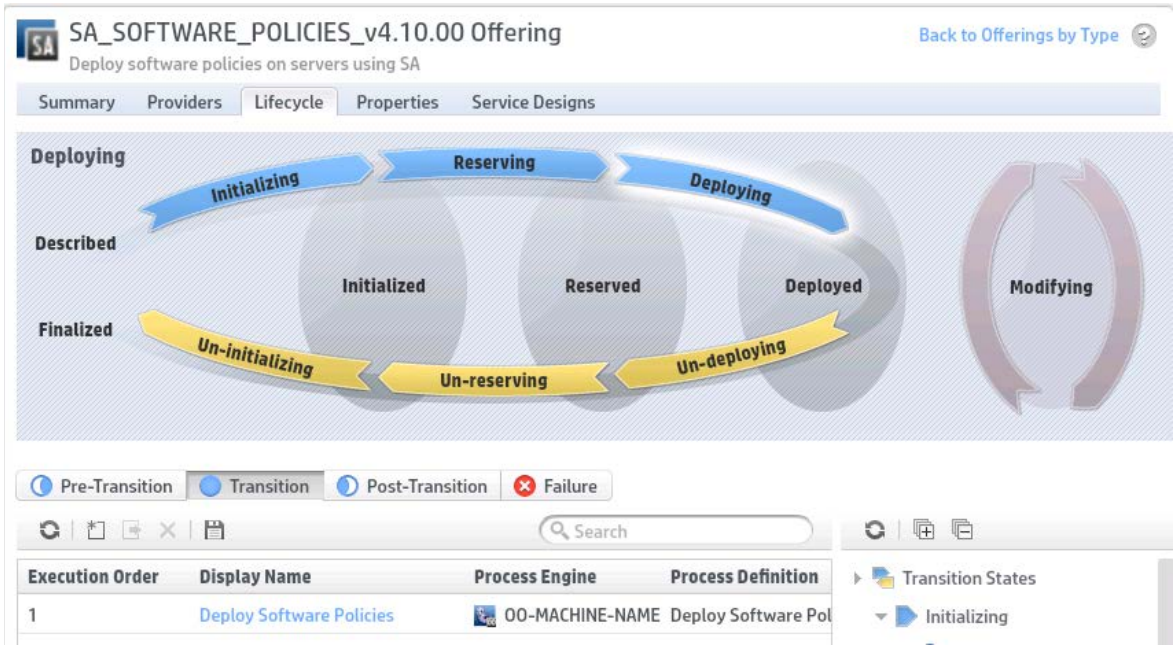
   Builds the HP SA provider list and selects one of them to be used for deploying the application by the resource offering mentioned below. The selected provider name will be saved in a property 'SA_PROVIDER'. This resource offering is associated with the Delegated Topology Group.



2. SA_SOFTWARE_POLICIES_v4.10.0000

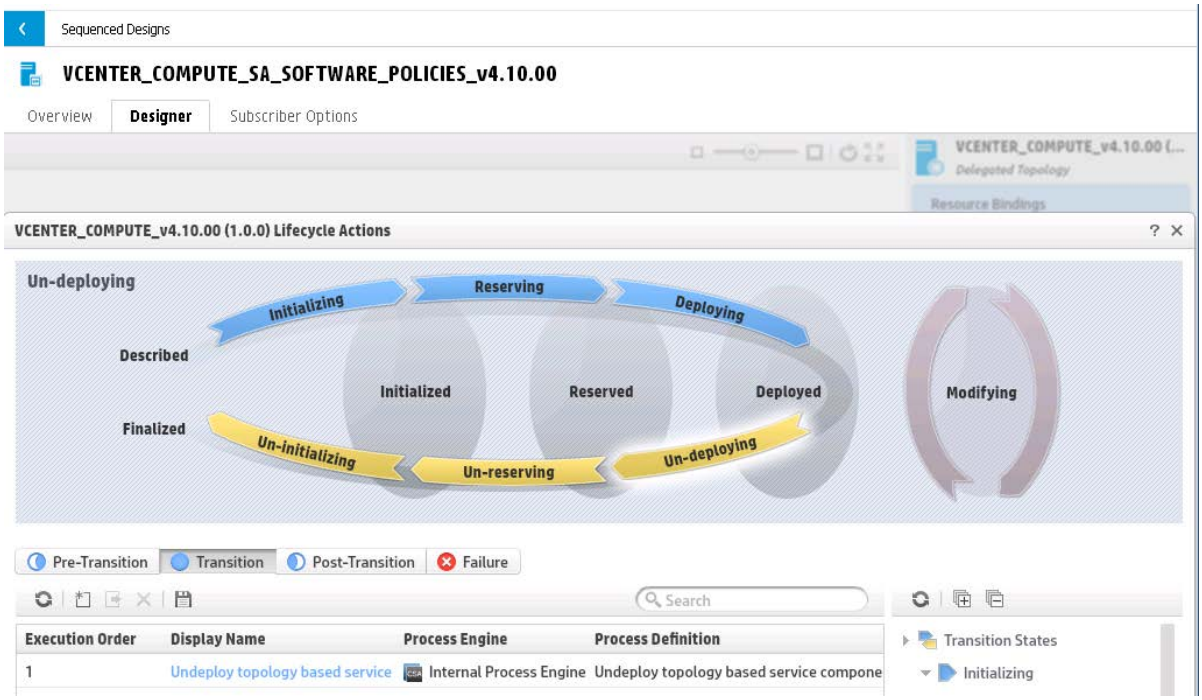
   Deploys the applications on the vCenter VM instance using HP Server Automation (HPSA) and works with realized topology instances. This resource offering is associated with the Delegated Topology template

   Deploy Lifecycle actions are configured to execute in the transition phase.



Un-deploy action is configured to execute in the pre-transition phase so that the server instance gets unmanaged on HP SA before the instance is deleted.

Lifecycle action of the Delegated Topology Template

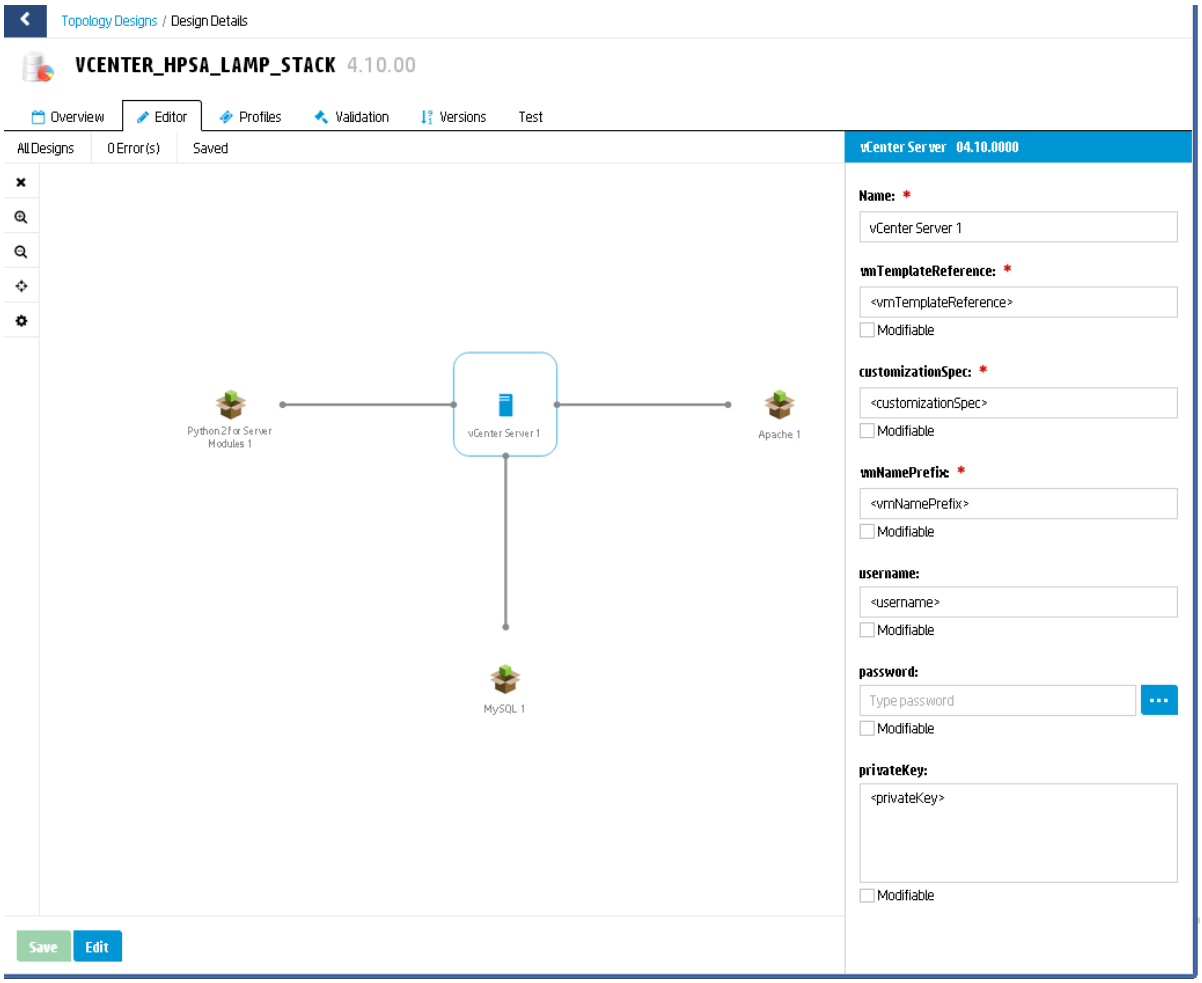


By default the deploy and un-deploy actions of the delegated topology component are executed in the pre-transition state. Similarly, the un-manage server action on the resource offering SA_SOFTWARE_POLICIES is executed in the pre-transition state.

For orchestrated based topology designs, the un-deploy action has to be executed after the un-mange server action. To do this, the un-deploy action of the delegated topology template is moved from pre-transition to transition state.

Use Case 2: Deploy Infrastructure and application from topology design and flex actions sequenced design.

OOTB topology design CSA_BP_VCENTER_HPSA_LAMP_STACK_v4.10.00 includes a vCenter server and associated HP SA embraced software components Apache, MySQL & Python


Topology Designs / Design Details
VCENTER_HPSA_LAMP_STACK 4.10.00
Overview
Editor
Profiles
Validation
Versions
Test
All Designs
0 Error(s)
Saved
Python 2 for Server Modules 1
vCenter Server 1
Apache 1
MySQL 1
vCenter Server 04.10.0000
Name: *
vCenter Server 1
vmTemplateReference: *
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Modifiable
customizationSpec: *
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vmNamePrefix: *
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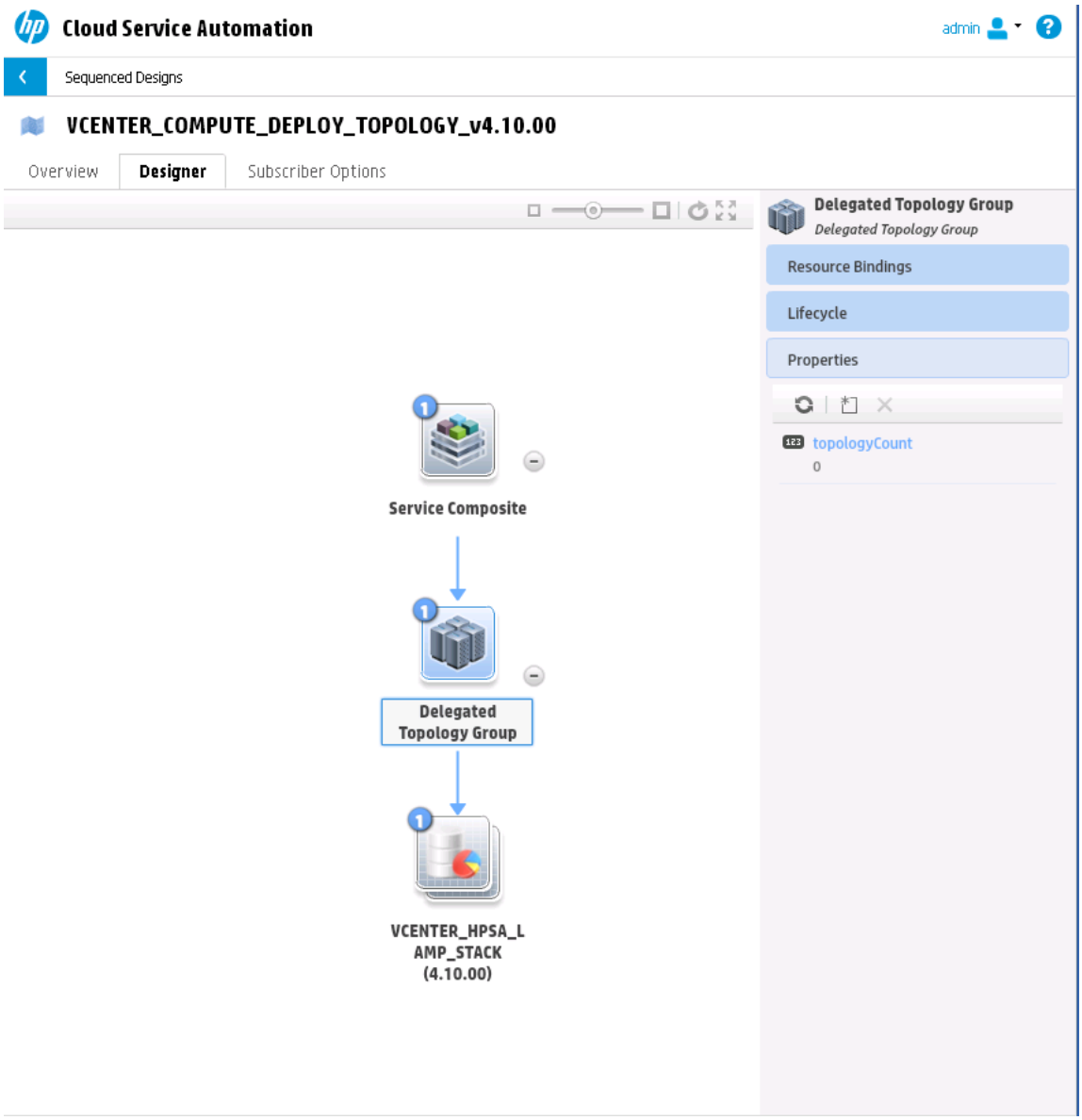
Modifiable
username:
<username>
Modifiable
password:
Type password
Modifiable
privateKey:
<privateKey>
Modifiable
Save
Edit

Sequenced design CSA_BP_VCENTER_COMPUTE_SA_SOFTWARE_POLICIES_v4.10.00 includes Service Composite, Delegated Topology Group and Delegated Topology



Design Components:

1. Delegated Topology Group

Property	Description
topologyCount	This value determines how many times the topology design will be realized.

2. Delegated Topology Template (VCENTER_COMPUTE_v4.10.00):

Property	Description
configurationId (profile)	Internal property, used to store topology profile id
topologyId	Internal property, ID of the topology gets assigned automatically from the component template

Public actions for topology deigns based on vCenter provider:

The two OOTB designs listed above have two public actions on the Delegated Topology Group component

- Flex-Out: This operation will deploy one more topology and increment the count by one.
- Flex-In: This operation will remove one of the existing topology and reduce the count by one.

Note: The orchestrated based OOTB designs are supported on the HP Operations Orchestration (HP OO) 10.10 version

Note: For a sequenced design that has a delegated topology component based on an orchestrated topology design, during subscription time, the subscriber is not given an option to choose resource provider instances as the provider selection option is not made available for sequenced designs. Resource providers are chosen by HP CSA for each resource provider type involved in the design by considering the resource environment configuration.

Known issues for topology designs based on HP Helion OpenStack provider

1. Option Set cannot be changed after importing the service designs

Issue: After importing the higher level entities (such as catalogs) that contain service design(s) with delegated topology(s), the user will not be able to change the option sets for a service design that has an associated service offering without disassociating the service offering.

Solution: No solution exists.

Workaround: The user needs to export/import the topology designs separately in addition to exporting/importing the sequenced designs that utilize delegated topologies separately, prior to importing the catalog. Importing the designs prior to importing the catalog will allow designers to reconfigure or synchronize the option sets in the sequenced design with the profiles of topology design.

2. Add Server action on the HP Helion OpenStack Server Group will not deploy applications

Issue: When the **add_server_to_server_group** action is executed, it will only create a new HP Helion OpenStack Instance; it will not deploy the application.

Solution: No solution exists.

Workaround: No workaround exists.

3. HP SA can manage only one instance deployed through HP Helion OpenStack

Issue: When the HP Helion OpenStack instances are managed thru HP SA, it can only manage the first instance registered. The subsequent instances cannot be managed because all the instances will have the same chassis id.

Solution: No solution exists.

Workaround: No workaround exists.