# HP Cloud Service Automation Concepts Guide



Software Version: 4.00

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This guide describes how HP Cloud Service Automation (HP CSA) helps you achieve flexible, on-time, and on-budget service delivery to your customers in a hybrid cloud environment. The guide reviews HP CSA key terminology, significant functionality, and important processes.

# Addressing cloud service management challenges with HP CSA

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

The HP CSA subscription, service design and resource utilization capabilities address three key challenges:

- The HP CSA Marketplace Portal provides a customer interface for requesting new cloud services and for monitoring and managing existing services, with subscription pricing to meet your business requirements.
- The HP CSA graphical service design and content portability tools simplify developing, leveraging, and sharing an array of service offerings that can be tailored to your customers' needs.
- The HP CSA lifecycle framework and resource utilization features ease the complexity of mapping your cloud fulfillment infrastructure into reusable, automated resource offerings for on-time and on-budget delivery.

HP CSA addresses these challenges from a task- and role-based perspective:



## Figure 1 CSA functionality

# **Requesting cloud services**

Your customers request new cloud services and manage their existing services with the HP CSA Marketplace Portal. Your customers can complete the following tasks.

- Request subscriptions for services offered to their groups.
- View status of pending requests, pending approvals, and approved subscriptions, including detailed component
  information.
- Request service modifications and other actions for their cloud services, and
- Cancel subscriptions.

Marketplace Portal users include these groups:

- Consumers use cloud services.
- Subscribers request cloud services for themselves or on behalf of others.
- Approvers grant others' requests for services when an approval is required.

# **Designing cloud services**

Tailor service offerings to your customers' needs using the Designs, Components, Offerings and Catalogs areas of the Cloud Service Management Console.

Create service designs in the Designs area. Here you assemble hierarchies and layouts of service components that define how to instantiate an orderable service. Add resource bindings, subscriber options, lifecycle actions, and custom properties to sequenced designs. Create profiles for topology designs. Leverage designs provided with HP CSA, or import designs from your own or others' collections with the HP CSA content portability tools.

In the Components area, create reusable component types as starting points for the components of your sequenced designs.

Add pricing, images, and other specific information to create service offerings based on service designs. Associate service offerings with specific consumer groups and approval processes in service catalogs.

The HP CSA Cloud Service Management Console provides tailored views for these design and business management roles:

- Service designers build topologies and automation sequences that define the components and optionally lifecycle actions for realizing a service. Service designers collaborate with resource supply managers to create service designs that call upon existing resource providers and resource offerings.
- Service business managers create and manage service offerings and service catalogs.
- Consumer service administrators configure and manage consumer and provider organizations.
- Service operations managers view and manage subscriptions and service instances for their organizations.

# **Delivering cloud services**

Tame the complexities of your cloud fulfillment infrastructure with the HP CSA resource utilization and lifecycle design processes. Leverage and create reusable resource offerings with the HP CSA graphical design tools. Invoke external processes from your resource offerings with the HP CSA pre-defined integration mechanisms. Associate resource offerings to sequenced design components with resource bindings that take effect when the service is instantiated. Structure automated actions for your sequenced designs and resource offerings using the HP CSA lifecycle framework.

The HP CSA Cloud Service Management Console provides tailored views for the resource supply manager role. Resource supply managers identify the resource providers and resources that HP CSA will use to provide cloud services. Resource supply managers also create reusable resource offerings that specify the lifecycle actions for consuming and managing a resource.

HP CSA administrators have access to all Cloud Service Management Console functions for the following tasks:

- Manage product licensing
- Perform initial HP CSA configuration
- Control system access by assigning and maintaining primary user roles
- · Configure cloud resources, component types, service designs, and service offerings
- · Manage catalogs, organizations, and subscriptions

You can customize and extend the HP CSA base software to broker cloud services as an integral part of your business.

# Subscribing to an HP CSA service

Let's say that you are the IT lead for a small cloud services company, Superior Cloud Services Company (SCSC). One of your most innovative customers—Advantage, Inc.—is eager to increase their use of cloud technology. You are currently conducting a pilot program with the Advantage QA team before rolling out your initial cloud services to all Advantage employees. You've been working very closely with Alice Fairfax, the lead QA engineer at Advantage.

Your goal is to enable a fully automated subscription process that creates cloud services on demand. Let's watch Alice Fairfax step through exactly such a process using your HP CSA deployment. Your HP CSA deployment allows Alice to complete the following actions:

- Log into the Advantage, Inc. Marketplace Portal
- Request a subscription to a compute infrastructure service
- Track the provisioning process for the compute infrastructure service
- Access the server provisioned as part of the compute infrastructure, using the credentials and access details provided by HP CSA

# Logging into the Marketplace Portal

HP CSA delivers cloud services to customers through an innovative enterprise-ready design with the Marketplace Portal. In this design, users order services tailored specifically to their needs, based on offerings in service catalogs associated with each user's organization.

Alice logs into HP CSA through the Marketplace Portal, which has been customized to her needs as a QA engineer with Advantage, Inc.



Figure 2 Marketplace Portal for Advantage, Inc.

In addition to finding and ordering new services under Browse Catalog, Alice can drill into more detail for her services, subscriptions, and requests under other tiles.

The Marketplace Portal features an adaptive user interface that adjusts to the available display area. For example, this portal for an HP organization displays different layouts in a browser and on a smartphone.



Figure 3 Marketplace Portal adaptive user interface

# **Requesting a service**

Let's see how Alice orders a new service. Alice easily navigates to the list of service offerings available to her. She selects a service offering and places her order.



## Figure 4 Ordering a cloud service

Alice chooses from among several service configurations available with this service offering. Each configuration option entails different initial and recurring costs, which the Marketplace Portal automatically calculates and displays as Alice makes her choices.

Once Alice completes her service configuration choices and selects Checkout, the Marketplace Portal displays her order information including subscription costs. Alice can own this subscription individually, or she can specify group ownership by the entire QA team. Alice places her subscription for a set term with a specified end date. She could also choose a recurring subscription that would continue until explicitly cancelled. Alice selects her subscription options, accepts the Terms and Conditions for this subscription, and submits her subscription request.

This subscription request does not require an approval, so upon receipt of her order HP CSA simply triggers the automated provisioning of Alice's requested service.

# Tracking the provisioning process

Alice can proactively monitor provisioning progress in the My Services area of the Marketplace Portal. The Marketplace Portal updates service status as the service moves through states such as Reserved, Deploying, and Online.

Or, Alice can wait until HP CSA displays a notification of provisioning success or failure in the Notifications area.

# **Receiving notification**

HP CSA also provides Alice with login information and other configuration details under Notifications once HP Cloud OS completes provisioning. Alice uses these details to directly access her HP Cloud OS infrastructure service.

# **Managing a subscription**

Alice can also manage her subscription and its associated service. Alice can take actions such as the following:

- Changing her subscription end date
- Suspending a server
- Cancelling her subscription

Alice makes subscription and service modifications from the Marketplace Portal. To suspend a server, Alice navigates to the server in her active subscription details and requests the appropriate server action.



## Figure 5 Requesting a service action

The suspend operation displays in the HP Cloud OS portal.

CloudSystem User F	Portal	-								Settings		Sign Out
Project Admin												
Current Project admin	Instances								Q.			Filter All
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Routers	test2server-1-T749	Cirros	192.168.0.4	m1 tiny   512MB RAM   1 VCPU   1G8 Disk	CSA_Test	Active	None	Running	2 hours, 36 minutes		Create Snapshol	More -
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	DEMOTestSG2-1-T682	Cirtos	192,168.0.6	m1 tiny [ 512MB RAM ] 1 VCPU   1G8 Disk	CSA_Test	Active	None	Running	12 bours, 5 minutes	5	Create Snapshot	More ~
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Alice can request subscription changes or cancellation from the same area of the Marketplace Portal.

# **Creating a service offering**

Alice subscribed to an HP CSA service offering. You enabled Alice's subscription by configuring HP CSA to broker this service offering to Alice's group, the QA team at Advantage, Inc. Let's review the configuration steps you took after you installed HP CSA.

You first configured HP CSA organizations and users with the following steps:

- 1. Customizing the HP CSA provider organization as Superior Cloud Services Company
- 2. Configuring yourself as an HP CSA administrator
- 3. Logging in to the HP CSA management console with your new HP CSA administrator account
- 4. Configuring Advantage, Inc. as an HP CSA consumer organization
- 5. Configuring Alice Fairfax as an Advantage, Inc. service consumer

You then configured the service offering with the following steps:

- 1. Configuring an HP Cloud OS resource provider
- 2. Using an out-of-the-box HP Cloud OS topology design as a starting point to create a new design called "Simple Compute HP Cloud OS Infrastructure" for a straightforward infrastructure provisioned by HP Cloud OS
- 3. Creating a service offering called "HP Cloud OS Topology" based on your simple HP Cloud OS topology design
- 4. Publishing the HP Cloud OS Topology service offering in the global catalog

# **Configuring HP CSA organizations and users**

HP CSA uses *consumer organizations* and *catalogs* along with identity management system data to map tailored service offerings to the appropriate subscribers. HP CSA also defines one *provider organization* per HP CSA instance. You assign provider organization roles to control access to HP CSA administrative functions.

During initial configuration of HP CSA itself, you configured SCSC as the provider organization. You logged into HP CSA's Cloud Service Management Console as an HP CSA administrator to perform this initial configuration. You first used the default HP CSA administrator account *admin* but once you set yourself up with your own HP CSA administrator account, you used your own account and disabled the default *admin* account.



## Figure 7 Cloud Service Management Console dashboard

In the Organizations area of the management console, you set the HP CSA provider organization's name to "Superior Cloud Services Company" and customized the management console user interface to meet your team's needs. You took into

consideration the responsibilities of each of your IT team members as you configured their roles and authorizations under the HP CSA provider organization. The role you assigned to each team member controls what that member will see in the Cloud Service Management Console.

You also created your first HP CSA consumer organization here. You can define multiple consumer organizations per HP CSA instance, but you only needed one for your initial pilot: Advantage, Inc. When you created the Advantage consumer organization, you customized the Advantage Marketplace Portal and added the Advantage QA team as service consumers. Alice Fairfax gained access to the Advantage Marketplace Portal at this point, as a member of the QA team in the Advantage identity management system.

Because your initial pilot is limited to one team in one HP CSA consumer organization, you did not configure organizationspecific HP CSA catalogs. All of your pilot service offerings can be published in the HP CSA global catalog, accessible to all HP CSA consumers. Later, in preparation for roll-out, you'll configure organization-specific catalogs and publish tailored service offerings in them.

# **Configuring a resource provider**

As part of your pilot project, you installed and configured HP Cloud OS in your datacenter. For HP CSA integration, you simply defined a new HP Cloud OS resource provider for the HP Cloud OS infrastructure in your datacenter. You called this resource provider Datacenter HP Cloud OS. You defined this resource provider in the Providers area of HP CSA's management console. During this definition, you specified details such as user credentials and the URL for your HP Cloud OS service access point.

# **Creating an HP Cloud OS topology design**

To provide on-demand automated service delivery, you create, configure, and modify service designs comprised of reusable components. You also reuse designs for multiple service offerings, each customized to meet the needs of different consumer organizations and groups.

HP CSA supports two types of service designs: topology designs and sequenced designs.

Topology designs specify components and their relationships to define the service lifecycle. Topology designs delegate lifecycle sequencing to cloud providers. Use topology designs for straightforward HP Cloud OS IaaS deployments.

Sequenced designs specify directed execution of component lifecycles and permit explicit specification of lifecycle actions. Use sequenced designs for complex services that rely on run book automation, such as integrations with legacy data center systems.

You associate topology designs with an existing resource provider when creating or importing the design. You map sequenced designs to public or private cloud resource providers through resource offerings.

You leveraged the out-of-the-box content archive CSA\_BP\_CloudOS\_Singletier\_v4.00.00.zip to create the design for your first HP CSA service offering. You imported this content archive in the Designs area of the Cloud Service Management Console. The import wizard queried you for the HP Cloud OS resource provider. You selected Datacenter HP Cloud OS as the resource provider and specified the appropriate cloud profile and resource pool.

As a result of the import, a topology design called Single Tier appeared in your list of HP CSA topology designs. When you open this design, you see a design associated with the HP Cloud OS instance in your datacenter. The design contains three components and three design profiles.

Cloud Service Automation	() Cloud Se	ervice Automation	Cloud Service Automation
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🖰 Overview 🌶 Editor 🛷 Profiles 🐟 Validation	Single	<b>Tier</b> <i>Profiles</i> Validation	SingleTier
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		Wolume Group	

## Figure 8 Imported topology design

You configured default property values for the components and design profiles and published the design to complete the design process.

# Creating and publishing a service offering

Your published topology design can be used as the basis of multiple service offerings. For the pilot, you created just one service offering, and you experimented with HP CSA's subscription pricing features in cooperation with the Advantage team. Your first service offering included four configuration profiles. The default minimal configuration cost \$100 for initial provisioning with a monthly subscription fee of \$10. Progressively larger deployments entailed initial and recurring cost uplifts.

Offerings					
HP Cloud OS Ia	aS				
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ption Name		Initial	Recurring	Recurring w/Options	\$ 10.00
rofiles					
No profile selected.		0.00	0.00		
Large		150.00	75.00		
		75.00	30.00		
Medium					

Figure 9 Configuring a service offering

Your Advantage partners particularly liked that they were able to see the exact cost for selected options as they configured their subscription requests. The Marketplace Portal automatically displays updated costs based on the pricing you configured in the service offering.

Finally, you made this service offering visible to all of your consumers by publishing it in HP CSA's global shared catalog. Later, during roll-out, you'll need to decide if you will leave this particular service offering in the global catalog, where it is visible to all consumers in all organizations. You might instead move it to an organization-specific catalog so that the offering is visible only to selected consumers.

Publishing your service offering in the global catalog made it visible to Alice Fairfax—the final step for enabling the subscription sequence described on page 3.

# **Functional overview of HP CSA**

Before we delve into more examples, let's look at HP CSA from a functional perspective.

With HP CSA, cloud computing offers virtualized infrastructure, platform, and application resources as standardized service offerings, rather than one-off creations. IT as a cloud service provider automates the setup, monitoring, and ongoing management of cloud service delivery, in an enterprise IT setting or as a cloud service business.

In this automated delivery model, IT acts as a service broker or provider. Business focus returns to the IT customer, who selects services and controls service availability based on business needs. IT defines a just-in-time delivery model to meet each customer's requirements. With a virtualized and automated delivery process, IT as a service broker leverages economies of scale from the shared architecture and combined efficiencies of a cloud automation system. IT achieves this new reality by capitalizing on the innovative technologies of a hybrid cloud environment with its flexible service delivery models.

In a *private cloud* environment, IT deploys cloud applications entirely on-premise, operating within an organization's perimeter and deployed on its proprietary infrastructure. In a *public cloud* environment, public service providers (such as HP Cloud Services, Amazon, or Google) own cloud applications; individuals or organizations access the applications on a fee basis. A rich opportunity exists between these two opposites for resource optimization and service-delivery integration—what is sometimes referred to as *hybrid cloud* computing.

A hybrid cloud takes the best from both worlds. This environment features a flexible, scalable infrastructure that can be deployed with both privately managed and public infrastructure. For instance, you can purchase compute services, such as Amazon EC2, from an external provider. While tapping into the public cloud, you still retain the flexibility and safety of hosting mission-critical applications, such as payroll or financial applications, within the enterprise.

Unfortunately, most cloud management tools cannot be used to manage traditional IT environments. HP CSA can—as a truly hybrid IT solution with comprehensive unified management.

Cloud service providers use HP CSA to design, publish, and manage cloud services. Consumers order these services as ondemand subscriptions. Approved subscriptions automatically trigger service deployment on resources from both private and public cloud providers.

Figure 10 shows a simplified overview of CSA functionality. At the top of the diagram, service providers map between the needs of their consumers on the left and the capabilities of cloud providers on the right. Consumers need complete and customized offerings that include both service functionality and business attributes such as cost and length of service. Cloud providers offer resources that can be used to provide service functionality. As a service provider, you broker between consumers and cloud resource providers in three key ways:

- **Design**: You design and package services into automated offerings tailored to consumer needs. These needs include both service functionality and cost.
- Publish: You ensure that each service is offered to the right consumers and uses appropriate provider resources.
- Manage: You track and manage all services, and you enable consumers to track and manage their own services.



# Figure 10 CSA functional overview

Cloud service providers use the Cloud Service Management Console to create and configure HP CSA model objects called *artifacts*. Artifacts contain the information HP CSA needs to create and manage its top-level model elements and their relationships. Figure 10 shows the key artifacts for each of your major tasks.

On the left, the diagram shows artifacts chiefly concerned with the services offered to consumers. On the right, the diagram displays artifacts principally related to resources offered by cloud providers. In the middle, the diagram lists artifacts primarily used to map between services and resources. Some artifacts serve multiple functions but are included only once in the diagram, where they are most relevant.

As a service provider, you create most of these artifacts. HP CSA creates some based on your artifacts and dynamic data such as consumer input or provider capacity.

Let's explore these HP CSA artifacts in more detail.

# Addressing consumer needs

Your consumers interact with HP CSA through personalized Marketplace Portals to order and release cloud services on demand. Let's break down these consumer tasks into more detail. We will also describe the artifacts that enable these on-demand consumer tasks. You configure most of these artifacts. HP CSA constructs some of the artifacts during service management. HP CSA bases these constructed artifacts on artifacts you configured earlier.

#### **Selecting services**

Consumers select the cloud services that meet their needs.

HP CSA artifacts		Service provider tasks
Service offerings	Service offerings encapsulate all the information consumers need to select the most appropriate services. Each service offering references a service design for definition of its service options and components.	Service providers tailor service offerings for each consumer group with specifics such as customized terms and conditions, option visibility, and pricing.
Service designs	Service designs represent the initial configuration for a service instance. Service designs provide a structure for options or profiles that consumers can select when ordering a service.	Service providers associate each service offering with the service design that best meets the target group's needs. Service providers can associate a single service design with multiple service offerings.

HP CSA artifacts		Service provider tasks
Service components	Service components and their relationships in a service design define the framework for creating a service instance. Subscription options can affect service component properties.	Service providers can bind component properties to subscriber options. This allows subscriber selections to affect service deployment.

## Ordering and approving subscription requests

Consumers order subscriptions for cloud services. These orders may require approval before being fulfilled. Approval policies define which members of a consumer's organization can approve or deny a particular subscription request.

HP CSA artifacts		Service provider tasks
Subscription requests	HP CSA constructs subscription requests when a consumer places an order for a service offering. HP CSA bases the subscription request on the service offering and on the consumer's option or profile selections. Approvers can view subscription details, such as cost information, when deciding whether to approve or deny a request.	Service providers publish service offerings in catalogs, each associated with a particular HP CSA consumer organization. Consumers can only order services from catalogs associated with their organizations or from the global catalog.
Approval processes	HP CSA marks a subscription request as approved once its approval process successfully completes. HP CSA only triggers service deployment for approved requests. A passive approval process automatically approves requests. HP CSA immediately marks these requests as approved and begins service deployment on the requested start date. An active approval process references an approval policy to determine the required approver. Some approval policies depend on organizational relationships, for example, a policy requiring approval from a consumer's manager. For this type of approval policy, HP CSA determines the consumer's manager by querying the organization's identity management system. HP CSA then generates a subscription approval request for the manager's HP CSA account.	Service providers configure approval processes and policies on catalogs or on service offerings. Service providers can integrate HP CSA with an external approval system for complex approval processes.
Catalogs	Catalogs map service offerings to specific groups within a consumer organization. Publishing a service offering in a catalog makes the offering visible to the groups associated with the catalog.	Service providers configure each catalog as visible to specific groups within the catalog's associated organization. Service providers also specify the default approval process and the available approval policies for each catalog. Service providers can publish a service offering in multiple catalogs to make it visible to more than one set of consumers.
Organizations	Organizations typically represent business entities such as a company or a department. HP CSA queries the organization's identity management system to determine the organization's members and groups. HP CSA	Service providers create and configure organizations in the Cloud Service Management Console. Service providers specify each organization's identity management system and customize each

uses this information to authenticate and organization's portal.	HP CSA artifacts		Service provider tasks
authorize HP CSA users and their actions. HP CSA does not directly provide user administration. Service providers assign each catalog to a single HP CSA consumer organization duri catalog creation.		uses this information to authenticate and authorize HP CSA users and their actions. HP CSA does not directly provide user administration.	organization's portal. Service providers assign each catalog to a single HP CSA consumer organization during catalog creation.

#### **Managing subscriptions**

Consumers can manage, cancel, and modify subscriptions and associated service instances while subscriptions are active. Consumers can cancel subscriptions to release a service that is no longer needed. Consumers can also request extensions for term subscriptions if they need services beyond the scheduled end date. Consumers can modify service instances that include flex capabilities, for example, increasing the amount of memory for a virtual server. Consumers can also trigger actions for service instances that include public actions, for example, a reboot.

HP CSA artifacts		Service provider tasks
Subscriptions	HP CSA constructs subscription artifacts based on approved subscription requests. Subscription artifacts encapsulate details about the subscription as well as its realized service instance. Subscription details include approval requirements, start date, and end date. Service instance details include the realized service components and any public	HP CSA bases each subscription on the service offering and options requested by the consumer. Service providers need not intervene once the service offering is published in an HP CSA catalog. HP CSA automatically manages deployment, modification, and undeployment based on previously configured artifacts.
	actions.	Service provider operations staff can view all subscription and service instances using the Operations area of the Cloud Service Management Console. Service providers can reassign the ownership of any subscription from this view.
Service instances	HP CSA constructs service instance artifacts during service deployment. HP CSA updates service instances during service management. Service instances encapsulate all the details of the deployed service and its components, for example, provisioned IP details for a network segment component.	HP CSA bases service instances on the service design configured for the service offering and on consumer demand.

# Using resources from private and public cloud providers

Service providers configure HP CSA artifacts such as service designs, resource offerings, and environments to define automated fulfillment processes. Fulfillment occurs on resources managed by private and public cloud providers, Service providers use HP CSA *resource provider* artifacts to identify available private and public cloud providers.

Service providers may also need to constrain certain service offerings to particular resource sets. For example, test system offerings might be provisioned with public cloud resources, while production application servers could be constrained to inhouse IT systems for business continuity and security.

Once the service provider configures all the HP CSA artifacts that underpin a service offering, HP CSA triggers automated fulfillment based on consumer demand. We break down these HP CSA functions into more detail in the following sections. We will also consider how service providers configure HP CSA artifacts for each function.

#### Selecting cloud resources

HP CSA selects the cloud resources for fulfilling a service subscription.

Service providers affect resource selection in several ways. At design time, service providers constrain design components to types of providers and resources capable of provisioning the component.

HP CSA artifacts		Service provider tasks
Service designs	Service designs represent the initial configuration for a service instance. HP CSA supports two types of designs: sequenced and topology. Sequenced designs provide mechanisms for controlling resource selection as each component is deployed. Topology designs are bound to resource providers when the design is created or imported.	Service providers combine reusable service components into a service design for each cloud service. Service providers can leverage service designs shipped with HP CSA as well as exporting and importing designs between HP CSA systems.
Service components	Service components and their relationships in a service design define the framework for creating a service instance.	For sequenced designs, service providers specify resource bindings on components to constrain provider selection. These bindings link the component to one or more resource offerings that provision the component.
		For topology designs, service providers specify the resource provider when creating or importing the design.
		Service providers leverage service components shipped with HP CSA. Service providers can also create new service component types for sequenced designs.
Resource offerings	Resource offerings specify the actions required to manage a resource through the entire service lifecycle. HP CSA uses resource categories to constrain bindings between sequenced design components and resource offerings.	Service providers assign a category to each resource offering during offering creation. Service providers configure resource category constraints on component types. A sequenced design component can only be bound to resource offerings from categories listed in the component type's constraints.
		Service providers can reuse resource offerings for multiple components in multiple sequenced designs.
Resource providers	Resource provider artifacts encapsulate the information HP CSA needs to interact with each public and private cloud provider.	Service providers configure resource provider artifacts for each cloud provider. Service providers specify details such as credentials and access points for each resource provider. Service providers also identify the resource offerings available from each cloud provider.

## Constraining provider selection for sequenced designs

With sequenced designs, HP CSA defers final selection of the resource provider until service deployment. For service offerings based on sequenced designs, you can constrain this final selection by one or more of the following mechanisms:

You can direct HP CSA to constrain resource provider selection based on environments. Environments link resource
providers to particular service offerings and consumer groups using catalogs. You can configure a catalog with a list of
allowed environments. HP CSA will only consider resource providers associated with these allowed environments during
provider selection. You create associations between environments and resource providers by adding environments to a
resource provider or by adding resource providers to an environment.



## Figure 11 Environment linkages

• HP CSA checks the associations between resource offerings and resource providers. Recall that resource offerings are in turn bound to sequenced design components during service design. At final provider selection, HP CSA will only consider providers currently associated with the bound resource offering.



## Figure 12 Cloud resource linkages

Service providers can configure provider selection actions on sequenced design components. These actions can compare
measurable properties of design components against current provider capacity. This type of provider selection action will
choose a provider currently able to meet the demand represented by the measurable properties. Measurable properties
can also be used to track resource availability.

HP CSA artifacts		Service provider tasks
Environments	Environments provide a sequenced design mechanism for limiting the resource providers used by particular consumer groups. HP CSA restricts provider selection at subscription time to any environments linked to the catalog where the selected service offering is published. HP CSA ensures that only providers from the associated environments are used to provision the services offered in this catalog.	Service providers add resource providers to environments. Service providers map environments to particular service offerings and consumer groups by associating environments with an HP CSA catalog. This links the environments to the service offerings published in the catalog and to the consumer groups that have been granted access to the catalog.
Resource types	HP CSA constrains associations between resource offerings and resource providers based on resource type.	Service providers assign types to resource offerings and to resource providers when creating them. Service providers can also add new resource provider types.
		Service providers add resource offerings to each resource provider. Service providers can only choose resource offerings of the same type as the resource provider.

## Deploying, managing and undeploying services

Cloud resource providers directly manage the Infrastructure-as-a-Service (IaaS) and Software-as-a-Service (SaaS) elements used to deploy and manage a service. Cloud providers expose programmatic interfaces for allocating and controlling the IaaS or SaaS elements they manage.

HP CSA artifacts		Service provider tasks
Subscriptions	HP CSA triggers service deployment actions on the start date of approved subscriptions. Subscription artifacts encapsulate details about the subscription as well as its realized service instance.	HP CSA bases each subscription on the service offering and options requested by the consumer.
Service instances	Service instances encapsulate all the details of the deployed service and its components.	HP CSA bases service instances on the service design configured for the service offering and on consumer demand.
Service designs	Service designs control the service lifecycle. In topology designs, the layout and relationships between components implicitly	Service providers combine reusable service components into a service design for each cloud service.
	define the service lifecycle. Topology designs delegate lifecycle management to resource providers. In sequenced designs, service designers can explicitly define the service	For topology designs, service providers specify design layout and component relationships to implicitly define the service lifecycle.
		For sequenced designs, service providers assemble hierarchies of service components that define how to instantiate a service offering. Designers specify the service lifecycle by directly defining lifecycle actions on design components, by binding components to resource offerings, or both. Service providers can in turn define lifecycle actions on resource offerings.
Actions	For topology designs, cloud providers define the service lifecycle and its actions. Cloud providers may expose some of these as public actions which consumers can trigger. For sequenced designs, service providers define lifecycle actions directly in designs or by binding components to resource offerings. Designers can expose lifecycle as public actions which consumers can trigger.	The Marketplace Portal automatically displays any public actions for a topology design component as defined by the cloud provider. For sequenced design components, service providers specify which lifecycle actions are visible to consumers. The Marketplace Portal displays all actions designated as visible.
Resource instances	HP CSA deploys and tracks realized design components as resource instances. HP CSA displays the realized components in each	For both topology and sequenced designs, service providers can initialize component properties at design time.
	subscription's service details. With topology designs, cloud providers set and read resource instance properties and attributes.	Designers also specify component properties for lifecycle actions to use. We will explore this further in Adding a sequenced design on page 17.
	With sequenced designs, lifecycle actions set and read resource instance properties and attributes.	

# Integrating HP CSA with other management systems

HP CSA can trigger actions for realizing services on a variety of fulfillment platforms. With sequenced designs, HP CSA may use a process engine such as HP Operations Orchestration (HP 00) to execute actions on the fulfillment platform. When HP

CSA invokes actions through a process engine, the actions interact with the programmatic interface exposed by the fulfillment platform. These actions deploy resources, reconfigure them, manage their state, or retire them.

You can leverage the HP 00 actions—known as *flows*—shipped with HP CSA. You can also create your own actions within the process engine itself. Alternatively, you might work with fulfillment platform administrators to coordinate use of their process engine actions. You must import process engine actions into HP CSA to employ them in sequenced designs. See the HP Cloud Service Automation Pack guide for more information on importing the sample HP 00 flows.

You map process engines actions into specific HP CSA lifecycle states and transitions in either resource offerings or sequenced designs. You can configure the sequencing, concurrency, and error handling behavior of actions in sequenced designs.

HP CSA can also interact with service assurance systems, configuration management systems, and other IT service management systems. HP CSA integrates with the HP ArcSight Logger to collect and analyze log records. HP ArcSight Logger can also correlate logging from multiple process and fulfillment platforms. This logging provides a complete picture of the actions executed for a subscription. You can configure HP CSA external approvals through integration with HP Service Manager. You can use HP Service Manager to implement complex multi-level approval policies. You can integrate HP Asset Manager for tracking asset allocation among organizations and consumers.

# Adding a sequenced design

With this new perspective on HP CSA, let's delve into more examples.

Let's say that your team at Superior Cloud Services Company also offers virtual servers that are provisioned on hardware hosted in your data center. You've long offered these virtual servers to your customers, but your team provisioned them manually. You tackled automatic provisioning of these as your second project.

Your team has used VMware vCenter to manage these virtual servers in your data center. You configured HP CSA to offer your fully automated virtual server subscription with these steps:

- 1. Using the out-of-the-box CSA\_BP\_VCENTER\_COMPUTE\_v3.20.00.zip content archive as a starting point to create a new sequenced design
- 2. Creating an HP CSA resource provider that reflects your data center's VMware vCenter configuration
- 3. Configuring associations between your resource provider and the resource offerings imported with the CSA\_BP\_VCENTER\_COMPUTE\_v3.20.00.zip content archive
- 4. Creating a service offering based on your vCenter service design
- 5. Publishing your service offering in the global catalog

# Importing a sequenced design content archive

Just as you imported a topology design content archive for your initial offering, you can import sequenced design content archives. You imported the CSA\_BP\_VCENTER\_COMPUTE\_v3.20.00.zip content archive in the Designs area of the Cloud Service Management Console, giving it the name VCENTER\_COMPUTE\_3.20. Because resource provider selection is deferred to the time of deployment, you do not need to specify a resource provider for a sequenced design import operation.

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< .	Sequenced Designs		(1) Cloud Service Automation			<b>2</b> · @	
VCENTER_COMPUTE_3.20		Sequenced Designs     VCENTER_COMPUTE_3.20					
Overview Designer Subscriber Options							
			Overvie	w Designer	Subscriber Options		
	Display Name	Image					Simple Compute Server Server
1	CENTER_COMPUTE_3.20						Resource Bindings
					0.00		0 D ×
Description Provisions simple compute server using vCenter. URL Disabled No					eventer Simple Compute Units Struice		Vitager vCenter
		Tags No Tags Defined	Server Group				
			Simple Compute Server			Ufecycle	
						Properties	

## Figure 13 Imported sequenced design

As discussed in Constraining provider selection for sequenced designs on page 15, HP CSA sequenced designs use resource offerings and resource bindings to defer resource provider selection until a service is deployed. The CSA\_BP\_VCENTER\_COMPUTE\_v3.20.00.zip content archive included the resource offerings bound to service design components. As a result, HP CSA also imported two resource offerings during your design import operation. The VCENTER\_COMPUTE\_3.20 resource offering is bound to the Simple Compute Server component of the imported design, as shown in Figure 13. The VCENTER\_COMPUTE\_FLEX\_SERVER\_RESOURCES\_3.20 resource offering is bound to the Server Group component of your service design.

WMware vCenter Offerings		
orienings		
	Q Search	
Display Name *	Description	Category
VCENTER_COMPUTE_3.20	Provisions simple compute server using vCenter	Compute
VCENTER_COMPUTE_FLEX_SERVER_RESOURCES_3.20	Adds/Removes CPU or Memory from all servers in the server group.	Compute
	VMware vCenter Offerings VMware vCenter Offerings C C C C C C C C C C C C C C C C C C C	VMware vCenter Offerings         VMware vCenter         Offerings         Image: Search         Display Name         • Description         Image: VCENTER_COMPUTE_3.20         Provisions simple compute server using vCenter         Image: VCENTER_COMPUTE_FLEX_SERVER_RESOURCES_3.20         Adds/Removes CPU or Memory from all servers in the server group.

Figure 14 Imported resource offerings

# Associating resource offerings with resource providers

For this sequenced design, you need a VMware vCenter resource provider. As with the HP Cloud OS resource provider you created earlier, you defined a new VMware vCenter resource provider in the Providers area of HP CSA's management console. You based this resource provider's details on the VMware configuration in your datacenter. You called this resource provider Datacenter vCenter Server.

You associate the VCENTER\_COMPUTE\_3.20 and VCENTER\_COMPUTE\_FLEX\_SERVER\_RESOURCES\_3.20 resource offerings with this resource provider by adding them to Datacenter vCenter Server's list of offerings.

# **Defining lifecycle actions and properties**

Sequenced designs use lifecycle actions to shepherd a design component or a resource offering through deployment, modification and retirement. Lifecycle actions communicate with resource providers through a process engine such as HP Operations Orchestration. Lifecycle actions also provide other important functions such as generating a notification or selecting a resource provider. For example, you might specify one or more of the following lifecycle actions to deploy a service:

- Start/stop a server
- Deploy an application
- Send a notification
- Deploy a server
- Configure monitoring
- Add to Universal CMDB

For example, the VCENTER\_COMPUTE\_3.20 resource offering includes a lifecycle action for the Deploying state.



## Figure 15 Resource offering lifecycle action

The HP CSA lifecycle engine executes lifecycle actions during lifecycle states. These states can be stable states, transition states, or the modifying state. For example, Deploying is a transition state, including pre-transition, transition, post-transition and failure sub-states. By contrast, Deployed is a stable state, indicating that the deployment activity has been accomplished. The Modifying state indicates that a subscriber has chosen to modify a subscription and that the changes are being processed by the lifecycle engine.



## Figure 16 CSA sequenced design lifecycle

HP CSA supports the following lifecycle states.

Transition states	Stable states
Initializing	Described—lifecycle actions cannot be specified at this state
Reserving	Initialized
Deploying	Reserved
Un-deploying	Deployed
Un-reserving	Finalized—lifecycle actions cannot be specified at this state
Un-initializing	

A subscription can pause when a failure occurs during the following lifecycle states: Initializing, Reserving, and Deploying. You must configure an organization to pause on failures if you want this behavior for the organization's subscriptions.

Sequenced design components provide the framework for the sequencing and coordination of lifecycle actions. The relationships between components in a sequenced design determine the execution order of lifecycle actions. You can configure actions directly on a component, mapped into lifecycle states. You can also collect and map actions in a resource offering, and then bind the resource offering to a sequenced design component.

Lifecycle actions read and set component property values. These values can be set in the design, set by lifecycle actions, or based on user input. You can specify which properties are displayed when a consumer views service details. In your VCENTER\_COMPUTE\_3.20 service design, for example, you set the number of servers to 1 for the Server Group component.

Cloud Servic	e Automation		admin 💄 👻 😮
Sequenced Designs			
VCENTER_CO	OMPUTE_3.20		
Overview <b>Design</b>	er Subscriber Options		
			Server Group
			Resource Bindings
	0		Lifecycle
	-		Properties
	vCenter Simple Compute		C A X
	0		0
			serverCount
	Infra Service		
	Server Group		
	Simple Compute		
	Server		

## Figure 17 Sequenced design component properties

You can also set component properties within a sequenced design by binding it to a subscriber option property.

# **Creating a service offering**

You created a service offering called Linux Test Server based on the VCENTER\_COMPUTE\_3.20 sequenced design and published it in the Global Shared Catalog. HP CSA sets sequenced designs to Enabled by default during the import operation. If you set the sequenced design to Disabled, HP CSA will not create new service offerings based on the design.

# **Configuring a specialized service offering**

You can customize service offerings for different target groups. You can base customized service offerings on the same service design using different attributes for each group. You publish a customized service offering in a catalog that is visible to its target group.

You can configure the following service offering attributes:

- Offering name, description, image and tags
- Option visibility for offerings based on sequenced designs
- Associated profile for offerings based on topology designs
- Subscription pricing
- Attached documents such as service level agreements or terms and conditions
- Associated screenshots or other images

You link each service offering to its target group by publishing the service offering in a catalog for that group. HP CSA uses catalogs to constrain the service offerings displayed for each user. The Marketplace Portal only displays offerings published in catalogs associated with one of the user's groups.

HP CSA manages catalog access through group memberships as configured in the organization's identity management system. HP CSA does not directly manage the creation or maintenance of individual users or organizational groups. You specify an identity management system for each HP CSA organization you create. You then configure the groups that can access the organization's user interface. You also configure catalog access for specific groups within an HP CSA organization. Each organization's group memberships must exist or be created in its identity management system. Often, existing groups naturally correspond to HP CSA access control needs. Sometimes you'll need to create new groups for specific needs.

Let's say that you want to expand your HP CSA pilot to a second customer, Skilled Manufacturing Company. Skilled Manufacturing currently uses your vCenter-based servers to test their automation software. Because this can involve production testing, Skilled Manufacturing requires that all servers have some recovery mechanism. Your customer Advantage, Inc. has no such requirement.

With the expansion of your pilot, you also implement subscription approval requirements.

You use the following steps to create specialized service offerings for Skilled Manufacturing and Advantage, Inc.:

- 1. Configure the Advantage default catalog to use active approval processes and policies
- 2. Move all existing service offerings from the global catalog to the Advantage default catalog
- 3. Create a new HP CSA organization for Skilled Manufacturing Corporation
- 4. Configure the Skilled Manufacturing default catalog to use active approval processes and policies
- 5. Create a new service offering based on your VCENTER\_COMPUTE\_3.20 design
- 6. Publish your new service offering in the default Skilled Manufacturing Corporation catalog

Let's go into more detail on each of these steps.

# Isolating Advantage service offerings

Before you can give Skilled Manufacturing access to HP CSA, you must ensure that your current service offerings are only visible to Advantage consumers. When Advantage was your only consumer organization, you could publish all your offerings in the global catalog, but this is no longer true.

To make your current service offerings visible only to Advantage consumers, you move them to the default Advantage catalog. When you created the Advantage, Inc. HP CSA organization, HP CSA created a default catalog for Advantage, Inc. but did not associate any groups with this catalog. The Advantage identity management system defines a group that includes all Advantage employees. You configure the Advantage default catalog to be visible to this all-employee group.

You have also decided to add approval requirements to all service offerings. When you discuss this with your two customers, you learn that Advantage wants all subscription requests to be approved by the subscriber's direct manager, while Skilled Manufacturing wants all subscription requests to be approved by a member of their automation team.

In the Catalogs area of the Cloud Service Management Console, you follow these steps to enable manager's approval for Advantage subscription requests:

- 1. You switch the approval process for the Advantage default catalog from PASSIVE to ACTIVE.
- 2. You select User Context as the approval policy.

3. You ensure that Advantage HP CSA organization is correctly configured to retrieve a user's manager from the Advantage identity management system.

The steps set the default process and policy for all service offerings published in the Advantage default catalog. You can override these defaults for individual offerings in the catalog.

Finally, you publish your existing service offerings in the Advantage default catalog and delete them from the Global Shared Catalog.

# **Creating Skilled Manufacturing offerings**

You follow the same steps described in Configuring HP CSA organizations and users on page 7 to create a new HP CSA consumer organization for Skilled Manufacturing Company. As part of the organization creation, HP CSA created a default catalog for Skilled Manufacturing Company.

Skilled Manufacturing wants its automation IT team to approve all service requests. In the Catalogs area of the Cloud Service Management Console, you configured a Named Group Approval policy for this default catalog and set Skilled Manufacturing's IT team as the named group. You specify that at least one member of this group must approve a subscription request before HP CSA begins service deployment.

Skilled Manufacturing also requires that all its test systems have a recovery mechanism, while Advantage has no such requirement. You created a separate service offering based on your VCENTER\_COMPUTE\_3.20 design for Skilled Manufacturing so that all selections include recovery.

Your service design includes three subscriber options, which are in turn displayed when you create a service offering. You turn off visibility of the One CPU option for the service offering you'll publish in Skilled Manufacturing's catalog. This ensures that Skilled Manufacturing employees can only request servers with either failover or high availability recovery mechanisms.



## Figure 19 Service offering option visibility

Your existing Linux Test Server service offering appears in the Advantage, Inc. default catalog. You publish your new Linux Server with Recovery service offering in the Skilled Manufacturing default catalog. This means that Advantage consumers will be able to order a Linux virtual server with just one CPU and no recovery mechanism, while Skilled Manufacturing consumers will not.

# **Managing cloud services**

We saw how a consumer requests an action against an active service instance when reviewing how Alice Fairfax suspended a server from the Marketplace Portal. Alice can also review all her current and past subscriptions, get details on each, and modify current subscriptions.

As a cloud service provider, you can also review current and past subscriptions for all consumer users. You can see the resource providers used to fulfill subscriptions. You can also reassign subscriptions if consumers leave an organization. You simply transfer their subscriptions to other consumers within their original organization.

After subscription transfer, the new owners can initiate subscription modification requests. HP CSA will forward requests correctly to the new owner's approver when approval policies are based on relationship to the subscriber—manager approvals, for example. The new owner will receive notifications, can trigger public actions, and can request subscription cancellation.

You can also monitor and manage subscriptions that were paused due to provisioning errors. HP CSA notifies operations staff of paused subscriptions. The Cloud Service Management Console also displays paused subscriptions in the Operations area. You can resume paused subscriptions after addressing the issues that caused the failures or cancel them if the problems cannot be fixed.

# **Exporting and importing HP CSA content**

To expedite service delivery, you can import and export service designs and resource offerings between running instances of HP CSA. You do this from the Cloud Service Management Console or with the command line Content Archive Tool.

HP CSA export operations package service designs and resource offerings into portable content archives. Service design content archives also contain the resource offerings the designs reference. Before importing content, you must first synchronize HP CSA with HP Operations Orchestration (HP OO) to include all HP OO process definitions referenced by HP CSA.

When importing design content, HP CSA determines if the required resource offerings are already installed on the system. HP CSA references existing resource offerings where appropriate. HP CSA imports new resource offerings automatically and links them with the imported service designs.

HP and HP partners also make available pre-built content for common resource providers, designed to be flexible and generally applicable. These qualities allow reuse in multiple service designs. After importing pre-built resource offerings, you identify the resource providers that can fulfill them.

HP CSA is shipped with pre-developed service designs and resource offerings that can be customized for your use. You can import and export this integrated "content" developed for specific HP CSA applications, and adapt it to your business needs. The out-of-the-box integrations shipped with this version of HP CSA are stored in a library folder on the HP CSA media.

You can also download integrations at the HP Live Network website: https://www.www2.hp.com/. Access to this site is restricted. HP customers must have an active HP support agreement ID (SAID) for HP Cloud Service Automation and an HP Passport sign-in to access the data on this site. For more sample services designs and sample resource offerings, see your HP Professional Services Representative.

# **Deploying HP CSA with HP Professional Services**

The HP Professional Services Organization (PSO) provides HP CSA deployment services. PSO staff members closely coordinate deployment planning and activities with on-site personnel. Initial on-site deployment services include basic network and storage set up and server installation for the HP CSA foundation and its component products. HP Professional Services can help you integrate HP CSA into your existing business processes, developing customized solutions that meet the needs of your organization.

HP CSA can be extended and customized to integrate into your business processes. Most high level HP CSA objects and entities can be customized to some degree. You can use the Cloud Service Management Console to extend the following HP CSA objects.

- Leveraging sample service designs and resource offerings: Using sample content archives as a starting point, you can create your own service designs and resource offerings
- Creating provider types: You can create new types of providers. For instance, you may want to add a provider type for database provisioning—say HP Database and Middleware Automation (HP DMA). To do this, you create a provider type, populating this new type with resource providers, such as specific HP DMA servers. Then you create resource offerings with a category—database—that can be filtered to be visible to certain service components.

- Creating component types and templates: Component types provide the starting point when adding a new component to a sequenced design. Component types are organized into component palettes. The component type defines the properties and initial property values of the service component and constrains the relationships that the service component can assume within the service design and with resource offerings.
- Creating customized lifecycle actions: You can create lifecycle actions for both sequenced design service components and
  resource offerings. For example, perhaps you want to email notification to a subscriber when a provisioned server comes
  online. You add the appropriate lifecycle action to the service design to trigger the notification process, first making sure
  synchronization with HP OO is in place, so that the service design generates the correct calls to HP OO flows. Then you
  edit the service component to create and associate the new lifecycle action.
- Creating service catalogs: Although you can have only one Global Shared Catalog, you can create multiple service catalogs per organization, each with a different selection of service offerings. For each catalog associated with an organization, you can associate the required approval process, access control policy, and catalog image.
- Using the HP CSA Application Program Interface (API): A set of API calls underlie HP CSA functionality. These
  representational state transfer (REST) APIs are designed to provide a clean separation of Marketplace Portal functions
  from Cloud Service Management Console functions. Therefore, organizations can build their own catalogs and
  subscription mechanisms on top of HP CSA, replacing the Marketplace Portal with their own alternate portal.

For more information about HP Professional Services or to plan for your HP CSA deployment, contact your HP representative.

For HP CSA installation and configuration procedures, refer to the HP Cloud Service Automation Installation Guide and the HP Cloud Service Automation Configuration Guide.

# **Master glossary**

This glossary defines terminology used throughout HP CSA.

# A

## Access Control

Allows a CSA Administrator or Consumer Service Administrator to control assignment of HP CSA user roles. User roles authorize access to specific parts of the Cloud Service Management Console or access to the Marketplace Portal. Access control also allows a service business manager or CSA Administrator to choose whether a service catalog is visible to all authenticated users of a consumer organization or to a subset of authenticated users of a consumer organization.

## Action

Command available in the Marketplace Portal for active subscriptions. For example, in an active subscription that includes a server component, you might be able to issue commands that start, stop, or suspend the server. Selecting an action in the Marketplace Portal creates a request for the action. Service Designers configure lifecycle actions in the Cloud Service Management Console and designate which lifecycle actions are visible to subscribers as actions. See also *Lifecycle Action*.

## Administrator

See CSA Administrator and Consumer Service Administrator.

## Approval

Response indicating the approval or denial of a service request. Designated approver of requests can view their responses to service requests in the Marketplace Portal under the My Approvals for Others category in the Requests area.

#### **Approval Policy**

Steps that HP CSA follows to determine how and when to approve a service request for a published offering with an active approval process. The CSA Administrator specifies the approval policy for an offering or a catalog by selecting one of three HP CSA templates: Named Approver Template, User Context Template, or Delegated Template. Policies can optionally refer to identity management settings when applied to service requests. See also *Approval Process, Approver* and *Lightweight Directory Access Protocol (LDAP)*.

#### **Approval Process**

One of two methods--Passive or Active--for granting service requests, configured for a service catalog and optionally overridden for individual service offerings. A passive approval process automatically approves requests. An active approval process follows the steps defined in the associated approval policy to determine approval. See also *Approval Policy*, *Approver* and *Lightweight Directory Access Protocol (LDAP)*.

#### Approver

An individual who is authorized to approve service requests from a set of subscribers (members of an organization who request cloud services). See also *Subscriber* and *Service Request*.

#### Artifact

An HP CSA model object that contains the necessary information to create and manage top-level model elements and their relationships.

## Automation Sequencing Topology

A representation of a service lifecycle and the lifecycle of each service component. The automation sequencing topology specifies how automation tasks are associated with service components, how tasks are sequenced and ordered, and how they relate and depend upon each other. The Service Designer lays out the automation topology to define the processing order of the actions associated with each service component and the overall service lifecycle sequence. See also *Service Topology*.

# B

# C

#### **Cloud Computing**

A model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (for example, networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. *From the National Institute of Standards and Technology, Information Technology Laboratory: The NIST Definition of Cloud Computing by Peter Mell and Tim Grance (<u>http://www.nist.gov/itl/cloud/upload/cloud-def-v15.pdf</u>).* 

#### **Cloud Service**

An entity for the delivery of cloud-computing capability to customers that can employ any of the following service models: Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS), or Software-as-a-Service (SaaS).

#### Component

See Service Component.

## **Component Palette**

A component palette contains a group of component types from which you can choose when creating service components in a service design.

## **Component Properties**

Component properties are used in the following ways in HP CSA:

- Service component instances User-defined attributes that allow a service component to send or receive values that are used to provision a service. For example, properties may be defined as a boolean, list, integer, or string.
- Component types A base set of attributes that can be used and edited when creating service components in a service design.
- Component templates A way to provide seed data for service designs in the form of defined attributes and initial, default values, both of which can be edited when used to create service component instances.

## **Component Template**

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 are used in a service design.

## **Component Type**

A component type provides the starting point when creating a service component during service design. The service designer must select a component type when adding a new service component to a service design. The component type defines the properties and initial property values of the service component and constrains the relationships that the service component can assume within the service design.

#### **Consumer Organization**

An organization composed of HP CSA subscribers (or consumers). Consumer organizations provide enterpriseready access to HP CSA cloud services. Members of a consumer organization place cloud service requests from service catalogs assigned to their organization. Consumer Service Administrators or CSA Administrators use the Cloud Service Management Console to set up and maintain consumer organizations. See also *Organization* and *Provider Organization*.

#### **Consumer Service Administrator**

An HP CSA user role. The Consumer Service Administrator configures and manages consumer and provider organizations. See also *CSA Administrator*, *Resource Supply Manager*, *Service Business Manager*, *Service Designer*, *Service Operations Manager*, and *User Roles*.

#### Constraint

Service Designers can configure two varieties 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 might 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 might be allowed resource bindings only to resource offerings assigned the categories Compliance, Compute, and Configuration Management.

#### Content

Programming entities such as HP Operations Orchestration flows and actions, or HP CSA resource offerings and service designs. Content is imported into running instances of HP CSA and the configured HP Operations Orchestration process engine to drive functionality.

# **CSA** Administrator

An HP CSA user role. The CSA Administrator has access to all functionality in the Cloud Service Management Console and initially configures authentication and authorization for HP CSA access. See also *Consumer Service Administrator, Resource Supply Manager, Service Business Manager, Service Designer, Service Operations Manager,* and *User Roles.* 

#### **Custom Properties**

User defined values configured on a service component, resource offering, or resource provider, typically read by HP Operations Orchestration flows during service provisioning. Custom properties can also be used to pass values between components of a service design and are used in conjunction with subscriber options to set properties on a service instance based on subscriber option selections. Certain properties can be made visible and/or editable in the Marketplace Portal. See also *HP Operations Orchestration (HP 00)* and *HP Operations Orchestration Flow*.

# D

# Dashboard

The initial navigation page for HP Cloud Service Automation.

## **Defined Constraint**

A constraint that is specified directly on component types.

#### Defined Property

A property that has been directly added to a component type, template, or resource type.

#### **Display Name**

The name that displays for the property.

# Е

## Environment

A mechanism for grouping related resource providers. One or more resource environments can be linked to a service catalog to restrict provider selection 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.

# F

# G

#### **Global Shared Catalog**

A single cloud-service catalog that is shared across all organizations per HP CSA instance. Service offerings published to the global shared catalog are visible to all users in all Marketplace Portals. The global shared catalog is indicated by the following icon: (••). See also *Provider Organization*.

# H

## **HP Cloud Service Automation**

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

## HP CloudSystem Matrix

An integrated HP CSA component that provides a converged infrastructure platform for private cloud deployments, including HP Matrix Operating Environment infrastructure orchestration (infrastructure orchestration) software for interactive service design and HP BladeSystem for blade architecture.

#### HP Cloud Service Management Console

Software that provides an HP CSA design and administration interface. The Cloud Service Management Console is designed to support the following user roles: Consumer Service Administrator, CSA Administrator, Resource Supply Manager, Service Business Manager, Service Designer, and Service Operations Manager. See also *HP Marketplace Portal*.

#### HP Marketplace Portal

Software that delivers cloud-services to subscribers (customers) by providing one or more service catalogs per organization. The Marketplace Portal is integrated into and shipped with HP CSA.

## **HP** Operations Orchestration

HP Operations Orchestration (HP 00) is a software product that coordinates communication between integrated products and managed devices. Customized HP 00 flows are essential to implementing the HP CSA service lifecycle. See also *HP Operations Orchestration Flow*.

#### **HP** Operations Orchestration Flow

A run-book automation workflow composed of operations, subflows, and integrations which implement a discrete action. Flow are synchronized with HP CSA, and presented as actions which can be configured with Resource

Offerings or directly attached to components. HP Operations Orchestration flows are created, modified, and saved using HP Operations Orchestration Studio. HP CSA includes a set of sample HP Operation Orchestration flows used by the HP CSA sample service designs. See also *Content* and *HP Operations Orchestration (HP OO)*.

## **HP** Professional Services Organization

Members of HP's Professional Services Organization (PSO) install and deploy the HP CSA solution.

#### Hybrid Cloud

A type of cloud-computing that features a flexible, scalable infrastructure that can be deployed using both privately managed and publically hosted resources. HP Cloud Service Automation is optimized for a hybrid cloud environment.

I

laaS

See Infrastructure-as-a-Service.

### Infrastructure-as-a-Service (IaaS)

The capability provided to the consumer is to provision processing, storage, networks, and other fundamental computing resources where the consumer is able to deploy and run arbitrary software, which can include operating systems and applications. The consumer does not manage or control the underlying cloud infrastructure but has control over operating systems, storage, deployed applications, and possibly limited control of select networking components (for example, host firewalls). *From the National Institute of Standards and Technology, Information Technology Laboratory: The NIST Definition of Cloud Computing by Peter Mell and Tim Grance* (<u>http://www.nist.gov/itl/cloud/upload/cloud-def-v15.pdf</u>).</u>

#### **Inherited Constraint**

A constraint that is inherited by component types from the hierarchy of types they are derived from.

#### **Inherited Property**

A property that is inherited from base parent and grandparent component types.

J

# K

## L LDAP

See Lightweight Directory Access Protocol.

## Lifecycle

The stages of programmatically deploying a cloud service: initializing, reserving, and deploying. Or conversely, the stages of removing a cloud service from deployment: un-deploying, un-reserving, and un-initializing. The service lifecycle also has a separate modification state.

## Lifecycle Action

A function that is run automatically at a specified lifecycle state and sub-state. Lifecycle actions reference internal or external process definitions, which perform the specified action, such as initializing, reserving, or deploying a service subscription. Lifecycle actions can be applied to service components or resource offerings as part of the service lifecycle. Lifecycle actions can also be configured on stable states and made visible to subscribers in the Marketplace Portal. See also *Actions, Lifecycle*, and *Process Definition*.

#### Lifecycle State

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

#### Lifecycle Sub-state

A lifecycle sub-state is a further refinement of a lifecycle transition state. Stable states do not have sub-states.

#### Lightweight Directory Access Protocol (LDAP)

An application protocol for accessing and maintaining distributed directory information services over an Internet Protocol (IP) network. Directory services may provide any organized set of records, often with a hierarchical structure, such as a corporate electronic mail directory. *From* <u>http://en.wikipedia.org/wiki/Liqhtweiqht\_Directory\_Access\_Protocol</u>.

In production environments, HP CSA requires configuration of an identity management system such as an LDAP directory of users and groups for authorization, authentication and access control.

# Μ

## Management Console

See HP Cloud Service Management Console.

#### **Modifying State**

A lifecycle state indicating that subscriber options are being modified and that those changes are being processed. See also *Lifecycle, Lifecycle Action, Lifecycle State, Lifecycle Sub-state, Stable State, Subscriber Options,* and *Transition State.* 

# Ν

## Name

A unique name for the property.

#### Notification

An email or portal communication indicating that a subscription-related event has occurred, for example, when a request for a subscription is approved, a subscription is cancelled, or a subscription fails or expires. HP CSA notifies subscribers about any change in subscription status. HP CSA notifies approvers when subscriptions requiring approval are requested or modified.

# 0

### Offering

See Resource Offering and Service Offering.

## Organization

An entity defined by the CSA Administrator, who determines a member's entry point into the cloud system and associates its members with services and resources. An organization can be a company, business unit, department, or group. Membership in an organization is determined by the organization's identity management configuration, which HP CSA accesses to authenticate the user's login credentials. See also *Provider Organization, Consumer Organization*, and *Lightweight Directory Access Protocol (LDAP)*.

# Ρ

## PaaS

See Platform-as-a-Service.

## **Paused Subscription**

A subscription that has halted provisioning in response to a lifecycle action error during the Initializing, Reserving, or Deploying transition state. CSA Administrators configure whether subscriptions should pause on failure for each organization. The Cloud Service Management Console displays paused subscriptions in the Operations area. The Marketplace Portal displays paused subscriptions as Pending.

#### Platform-as-a-Service (PaaS)

The capability provided to the consumer is to deploy onto the cloud infrastructure consumer-created or acquired applications created using programming languages and tools supported by the provider. The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, or storage, but has control over the deployed applications and possibly application hosting environment configurations. *From the National Institute of Standards and Technology, Information Technology Laboratory: The NIST Definition of Cloud Computing by Peter Mell and Tim Grance (<u>http://www.nist.gov/itl/cloud/upload/cloud-def-v15.pdf</u>).* 

#### **Process Definition**

A configuration that runs a specified internal (HP CSA) or external (HP OO flow) action.

## Provider

See Resource Provider.

## **Provider Organization**

A required organization that hosts HP Cloud Service Automation, manages consumer organizations, and manages resources and services, including those offered by third-party or public clouds. 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). A provider organization is indicated by the icon in the Cloud Service Management Console. See also *Organization* and *Consumer Organization*.

#### **Provider Type**

A way to classify resource providers and resource offerings for improved filtering and identification. HP CSA includes pre-defined, out-of-the-box provider types. Each instance of a resource 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 only be associated with providers that share the same provider type.

#### **Public Cloud**

An environment where cloud applications are owned by one or more public service providers (such as HP Cloud Services, Amazon, or Google) and accessed on a fee-basis by individuals or organizations.

#### Properties

See Custom Properties.

# Q

# R

## Resource

A specific instance of software or infrastructure used to enable cloud service delivery. See also Resource Provider.

## **Resource Binding**

A link in a service design between a resource offering and a service component. For example, a resource offering for a specific VMware vCenter VM template can be linked to a Server Group service component. The resource binding ensures that the resource offering is provisioned as part of the service component deployment.

#### **Resource Category**

A classification of resource offerings for improved filtering and identification. HP CSA includes some pre-defined categories out-of-the-box. A category is associated with a resource offering and is also used when assigning resource offerings to service designs. See also *Constraint*.

## **Resource Offering**

A capability offered by a provider (or a group of providers) associated with a service design. Resource offerings are defined in the Cloud Service Management Console. An offering has a single provider type and a single resource category. An offering is associated with providers to indicate which providers support the offering.

#### **Resource Pool**

A pool of resources associated with a resource provider. Note that resource pools apply only to certain provider types, such as HP Matrix Operating Environment and VMware vCenter.

## **Resource Provider**

A management platform that provides either Infrastructure-as-a-Service (laaS) or Software-as-a-Service (SaaS) to the cloud. For example, a provider of HP Matrix Operating Environment services provisions infrastructure and basic applications, while a provider of HP SiteScope services monitors applications.

## **Resource Supply Manager**

An HP CSA user role. The Resource Supply Manager creates and manages cloud resources, such as providers and resource offerings. See also *Consumer Service Administrator*, *CSA Administrator*, *Service Business Manager*, *Service Designer*, *Service Operations Manager*, and *User Roles*.

# S

## Service Business Manager

An HP CSA user role. The Service Business Manager creates and manages service offerings and service catalogs. See also *Consumer Service Administrator, CSA Administrator, Resource Supply Manager, Service Designer, Service Operations Manager,* and *User Roles*.

## Service Blueprint

See Service Design.

## Service

See Cloud Service.

#### Service Catalog

A collection of service offerings, configured in the Cloud Service Management Console. Subscribers see service offerings from organization-specific catalogs when they log into the Marketplace Portal.

#### Service Component

Represents one element required to realize a service subscription and provides a framework to describe the actions and resource offerings required to realize, manage, and retire this element. During the design process, service components are created from component types and component templates.

#### Service Composite

The root component of a service design.

#### Service Consumer

An HP CSA user role. Service Consumers request and manage subscriptions offered to their organizations. See also *User Roles*.

#### Service Design

A template (or blueprint) for an orderable service. A service design includes a hierarchy of service components, plus resource bindings, subscriber options, lifecycle actions, and custom properties, as defined by the Service Designer. See also *Service Designer* and *Service Offering*.

#### Service Designer

An HP CSA user role. The Service Designer designs, implements, and maintains service designs (also referred to as blueprints). See also *Consumer Service Administrator, CSA Administrator, Resource Supply Manager, Service Business Manager, Service Operations Manager*, and *User Roles*.

#### Service Offering

An entity developed by the Service Business Manager to refine existing service designs (or blueprints) and then publish them to a service catalog. A service offering adds pricing, images, and other specific information required for the subscription process. See also *Service Business Manager, Service Designer*, and *Service Design*.

#### Service Operations Manager

An HP CSA user role. The Service Operations Manager views and manages subscriptions and service instances. See also *Consumer Service Administrator, CSA Administrator, Resource Supply Manager, Service Business Manager, Service Designer*, and *User Roles*.

#### Service Request

A request for delivery of cloud services that is initiated by the subscriber (end user) from the Marketplace Portal. After the service request is approved, the request becomes a subscription. See also *Subscriber* and *Subscription*.

#### Service Topology

A topology diagram of a deployed service design (or blueprint), which allows you to see the service components and their relationships.

#### Software-as-a-Service (SaaS)

The capability provided to the consumer is to use the provider's applications running on a cloud infrastructure. The applications are accessible from various client devices through a thin client interface such as a web browser (for example, web-based email). The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, storage, or even individual application capabilities, with the possible exception of limited user-specific application configuration settings. *From the National Institute of Standards and Technology, Information Technology Laboratory: The NIST Definition of Cloud Computing by Peter Mell and Tim Grance* (<u>http://www.nist.gov/itl/cloud/upload/cloud-def-v15.pdf</u>).

#### Stable State

A lifecycle state indicating that an activity has been accomplished. Stable states include the following: Described, Initialized, Reserved, Deployed, and Finalized. See also *Lifecycle, Lifecycle Action, Modifying State, Transition State, Lifecycle State*, and *Lifecycle Sub-state*.

#### Subscriber

Enterprise business users who subscribe to HP CSA cloud services. A subscriber initiates service delivery and resource provisioning by making a service request in the Marketplace Portal, which must be approved according to a pre-configured process. See also *Approval Process, Service Request, Service Offering*, and *User Roles*.

#### Subscriber Options

Elements of a service design used to provide the options that are shown to subscribers (end users) in the Marketplace Portal. Subscriber options can be designated as non-selectable (view-only) or available for editing and modification. See also *Service Design, Service Offering,* and *HP Marketplace Portal*.

#### Subscriber Portal

See HP Marketplace Portal.

#### Subscription

An instance of a service offering as requested by a subscriber and granted through the relevant approval process. Subscriptions incur costs according to a cost structure developed by the Service Business Manager. See also *Subscriber, Service Offering, Service Request, Service Business Manager, and Service Operations Manager.* 

# Т

# **Transition State**

A lifecycle state indicating change from one stable state to another within the service lifecycle. Transition states include Initializing, Reserving, Deploying, Un-deploying, Un-reserving, Un-initializing and Modifying. See also *Lifecycle Action, Modifying State, Stable State, Lifecycle State, and Lifecycle Sub-state.* 

# U

# User Roles

Dedicated HP CSA job responsibilities that have been assigned within an HP CSA organization. A person may have only one role —for example, a dedicated HP CSA Service Designer—or one person can take several user roles. For example, a Service Designer could also take the role of Service Business Manager. User roles are defined in the Organizations area of the Cloud Service Management Console. See also CSA Administrator, Resource Supply Manager, Service Consumer Administrator, Service Designer, Service Business Manager, Service Operations Manager, and Subscriber.

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V
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W

XYZ

## For more information

To access other toolkits to design and extend services running on HP CloudSystem, go to hp.com/go/csdevelopers.

For more information on HP CloudSystem, visit <u>hp.com/qo/cloudsystem</u>.

HP software product manuals and documentation for the following products can be found at <u>http://h20230.www2.hp.com/selfsolve/manuals</u>. You will need an HP Passport to sign in and gain access.

- HP Cloud Service Automation
- HP ArcSight
- HP Operations Orchestration
- HP Server Automation
- HP SiteScope
- HP Universal CMDB

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