Hewlett Packard Enterprise

Cloud Service Automation

Concepts Guide

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Contents

Introduction

This guide describes HPE Cloud Service Automation (HPE CSA) key terminology, significant functionality, and important processes.

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

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

- The HPE 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 HPE 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 HPE 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.

Organization

An organization in HPE CSA determines a member's entry point into the cloud system and associates its members with services and resources. An organization typically represents a business entity, such as a company, business unit, department, or group. HPE CSA queries the organization's identity management system to determine the organization's members and groups and uses this information to authenticate and authorize HPE CSA users and their actions.

HPE CSA defines one provider organization for every CSA instance. You can assign provider organization roles to control access to administrative functions. Using the Cloud Service Management Console, members of the provider organization can create one or more consumer organizations, manage configured organizations, and manage resources and services (such as designing, offering, and publishing resources and services for consumption). The organizations, resources, and services that can be managed are determined by the role(s) assigned to the members of the provider organization. For example, the CSA Administrator manages all organizations, resources, and services, while the Consumer Service Administrator manages only the organizations.

The consumer organizations, using the Marketplace Portal, subscribe to or consume the resources and services set up by the provider organization. There may be multiple consumer organizations configured; however, each consumer or subscriber sees only the information for the consumer organization of which he or she is a member. HPE CSA uses consumer organizations and catalogs, along with identity management system data, to map service offerings to the appropriate subscribers.

HPE Cloud Service Automation User Roles

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

Provider Organization Roles

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

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

Consumer Organization Roles

The consumer organization roles authorize access to the Marketplace Portal.

- Consumer Organization Administrator - In this role, you can:
  - Create, edit, and delete catalogs in your organization's catalogs.
  - Manage service offerings in your organization's catalogs.
  - Manage access controls, approval policies, and categories in your organization.
  - Manage a user's subscriptions in a certain organization by performing actions on a subscription on behalf of the original subscriber.
  - Use HPE IT business analytics to measure and optimize the cost, risk, quality, and value of IT services and processes.
- Service Consumer - The Service Consumer requests and manages subscriptions offered to his organization through the Marketplace Portal. From the Marketplace Portal, the Service Consumer can browse catalogs, subscribe to services, view subscriptions, and approve/deny subscription requests. The Service Consumer cannot log in to the Cloud Service Management Console.

Access Control

You can add or remove directory service groups or organization units to a role by associating the organization unit's distinguished name to the desired role. The authenticated users, who are members of a group or organization unit that is assigned to a role, can perform specific tasks, and can access specific areas of the Cloud Service Management Console. You can assign group or organization unit's distinguished name to more than one role.

Resource providers

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

A provider corresponds to the specific instance of an application that HPE CSA can integrate with to help instantiate service designs. For example, to enable service designs that target HPE Matrix Operating Environment, you must first create a provider (with a provider type of HPE Matrix Operating Environment) in the Cloud Service Management Console. During this definition, you specify details such as user credentials and the URL for your HPE Matrix Operating Environment service access point.

Components

Components are elements of service design, sequenced or topological. Only topological components are displayed in the Components tab. Sequenced components are not associated with providers or provider types. From the Components tab, you can view the topological components associated with a specific provider instance and manage the topological components.

Service designs

To provide on-demand, automated service delivery, you create, configure, and modify service designs, which are the recipes for automating the cloud, and which are comprised of reusable service components. Service components and their relationships in a service design define the framework for creating the service.

Service designs also provide a structure for options that consumers can select when ordering a service. You can re-use designs for multiple service offerings, with each service offering customized to meet the needs of different consumer organizations and groups. You can also leverage service designs shipped with HPE CSA as well as exporting and importing designs between HPE CSA systems.

You can create the following types of designs:

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

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

- **Sequenced Design** - Sequenced designs specify directed execution of the service component lifecycle and provide mechanisms for controlling resource selection as each component is deployed. When creating sequenced designs, you specify resource bindings on service components to constrain provider selection. These bindings link the component to one or more resource offerings that provision the component. Use sequenced designs for complex services and services that rely on run book automation, such as integrations with legacy data center systems. Create a sequenced design as a directed component hierarchy to define lifecycle execution. Sequenced designs use components to group multiple automation providers within a single entity, and they permit explicit specification of lifecycle actions.

- **Subscriber Options –** Subscriber options allow you to expose service design options in the Offerings. These are sets of options for a service design. The options sets are made available in the Offerings. The subscriber options can further be refined by setting pricing for options, hiding options, and setting values for option properties. The subscriber options are then available to the Subscribers.

Service offerings

Service offerings encapsulate all the information consumers need to select the most appropriate services. Each service offering references a service design, which defines the service options and components of the service. You can tailor service offerings for each consumer group with specifics such as customized terms and conditions, option visibility, and pricing. When you are ready to expose the design to subscribers, you publish the service offering in a catalog in the Marketplace Portal.

Create a service offering from a sequenced or topology service design when you are ready to expose the design to subscribers in a catalog in the Marketplace Portal. You can create an offering from a sequenced or topology design. Pricing is configured on a service offering and supports initial, recurring, and option-specific pricing. You can choose to show or hide the initial or recurring price details to a subscriber in the Marketplace Portal. You can also attach documents to a standard service offering (e.g., service level agreements, terms, and conditions) and screenshots, which are images and captions that provide the user with a visual representation of the offering in the Marketplace Portal.

Customizing service offerings

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
- Subscription pricing
- Attached documents such as service level agreements or terms and conditions
- Associated screenshots or other images
- Multiple versions per service offering

You link each service offering to its target group by publishing the service offering in a catalog for that group. HPE 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. Pricing details can be hidden from the subscriber in the Marketplace Portal if configured in the service offering.

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

Catalogs

Catalogs map service offerings to specific groups within a consumer organization. Publishing a service offering in a catalog makes the offering visible in the Marketplace Portal to the groups associated with the catalog. You can configure each catalog as visible to specific groups within the catalog's associated organization, and you can also specify the default approval process and the available approval policies for each catalog. In addition, you can publish a service offering in multiple catalogs to make it visible to more than one set of consumers.

You can start by configuring the automatically created, default catalog (Global Shared Catalog,) or you can manually create a new catalog and associate it with an organization. Multiple catalogs can be associated with the same organization, and any changes made to the Global Shared Catalog will be visible in every organization's Marketplace Portal.

Service instances

Use the Operations area of the Cloud Service Management Console to view and manage subscriptions and service instances for all consumer organizations. A subscription originates with a subscription request, which is a request for delivery of cloud services that is initiated by the subscriber (end user) using a service catalog in the Marketplace Portal. After a subscription request is approved, a service instance is created.

HPE CSA constructs service instance artifacts during service deployment and 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. HPE CSA bases service instances on the service design configured for the service offering and on consumer demand.

Upgrading service instances based on sequence service designs

HPE CSA provides a **unique** ability to upgrade service instances based on sequence designs beyond the definition of original service design, for the purpose of adding additional operational control and capabilities. Through this capability you can accomplish a variety of use cases as explained in the following examples.

Take an example of a sequence service design that can be used for deploying virtual machines. Service instances based on this service design contain server components that represent virtual machines deployed during the creation of service instances. Through the service-instance upgrade process you can add additional capabilities to service instances, such as providing monitoring of virtual machines, configuring additional firewall rules on virtual machines, patching virtual machines with important updates, and deploying applications on top of virtual machines. Through the upgrade process, additional operational control can also be provided to the service instance, such as adding more public actions on top of existing public actions.

Take another example of a sequence service design that can used for deploying a multi-tiered application. As newer versions of the same application are available, or as application architecture changes over time, service instances representing the multi-tiered application can be upgraded to represent newer versions of the application or the new architecture of the application.

The service-instance upgrade process generally involves creating an upgrade version of a service design, creating an upgrade version of a service offering based on the upgrade version of the service design, publishing the upgrade version of a service offering into a catalog, and upgrading service subscriptions through the operations console or through a REST API.

For additional information on upgrading sequence design-based service instances, see the service instance upgrade whitepaper.

Exporting and importing HPE CSA content

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

HPE 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 HPE CSA with HPE Operations Orchestration (HPE OO) to include all HPE OO process definitions referenced by HPE CSA.

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

HPE and HPE 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.

HPE 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 HPE CSA applications, and adapt it to your business needs. The out-of-the-box integrations shipped with this version of HPE CSA are stored in a library folder on the HPE CSA media.

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

Continuous delivery with HPE Codar

HPE Codar facilitates continuous delivery in which every change to the system is releasable and that every code change can be deployed in production. Codar enables automation of continuous delivery where every code change triggers a build. Once the build is deployed, automated unit tests are executed, and the application is automatically deployed to an environment based on policies that are defined in a runbook automation flow. Continuous delivery aims to deliver frequently and get fast feedback from users. Elements of the core value proposition include the following:

- Declarative Based Modeling
- Infrastructure as Code (IaaC)
- Application Pipeline Management
- Open and Extensible APIs

Shopping for Cloud Services in the Marketplace portal

HPECSA delivers cloud services through an innovative, enterprise-ready Marketplace Portal. The Dashboard, the home page of the Marketplace Portal, provides a variety of ways you can shop for service offerings and manage your catalogs, service offerings, requests and subscriptions.

In the Dashboard banner, click Start Shopping to kick-start your shopping experience—to browse and order services by certain categories, by keyword search, and by quick links to service offering filters. You can also use the global search feature to browse for services and subscriptions.

Use the Sidebar Menu for quick and direct navigation to and from any view in the Marketplace Portal.

In the Dashboard, scroll up and down the rows of tiles to select and order service offerings by category and manage your subscriptions.

When you are logged in as a tenant administrator, you can access the Administration tiles to:

- Manage a user's subscriptions in your organization, on behalf of the original subscriber.
- View, create, edit, and delete catalogs in your organization.
- View, create, delete, publish, and unpublish services offerings in your organization's catalogs.
- Manage access controls, approval policies, and categories in your organization.
- Launch HPE IT Business Analytics, which automatically gathers metrics from CSA to build key performance indicators.
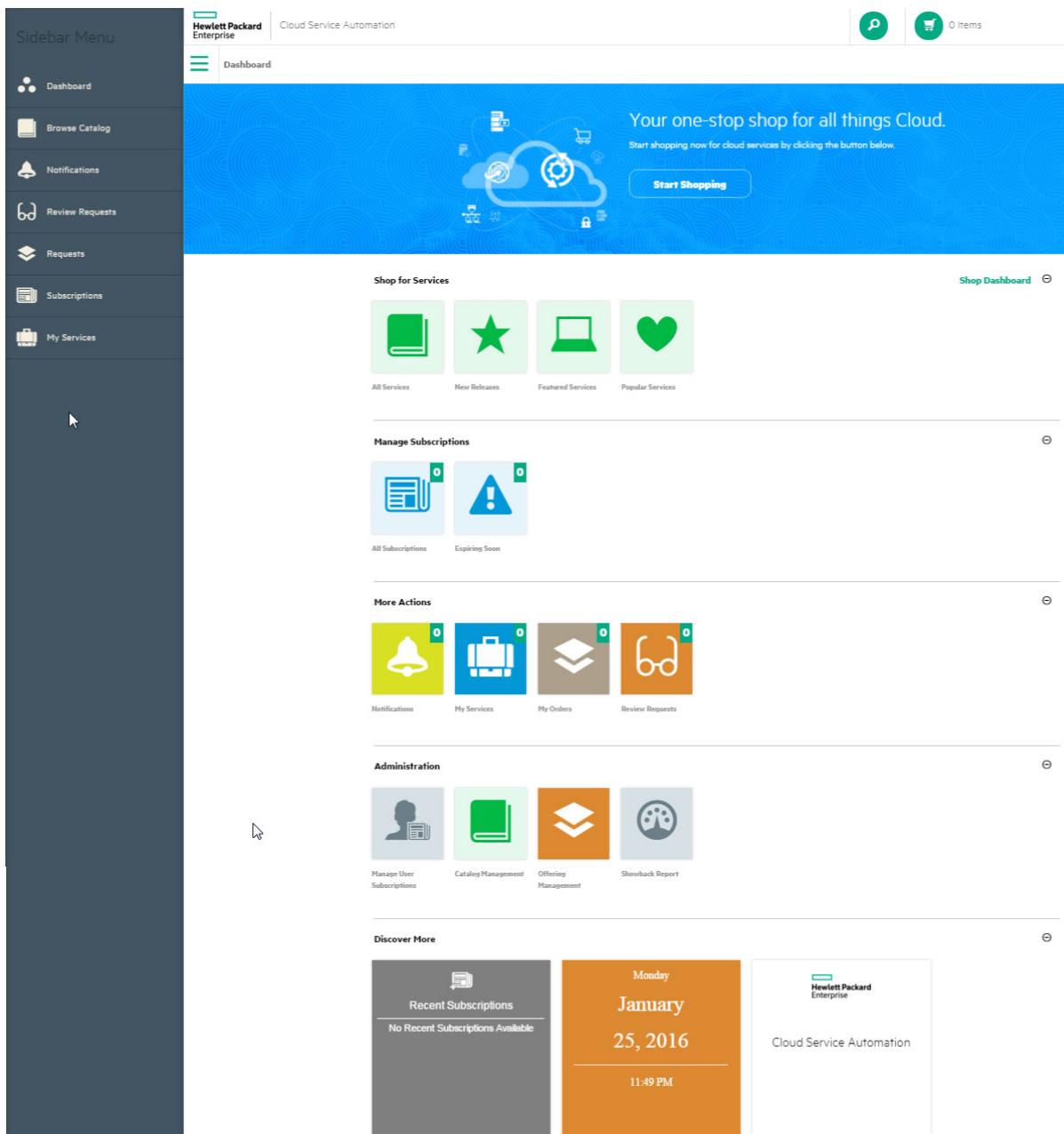

Figure 1 Marketplace Portal Dashboard

Navigating in the Cloud Service Management Console

Use the Cloud Service Management Console dashboard to navigate to the areas where you complete tasks, such as configuring organizations and users, creating designs, and managing catalogs. You can always click Cloud Service Automation in the title bar of the Cloud Service Management Console to return to the dashboard.

Depending on your role, you will see, and be able to access, specific areas of the Cloud Service Management Console. See the HPECSA Cloud Service Management Console Help for more information about the dashboard and about managing and configuring cloud services.
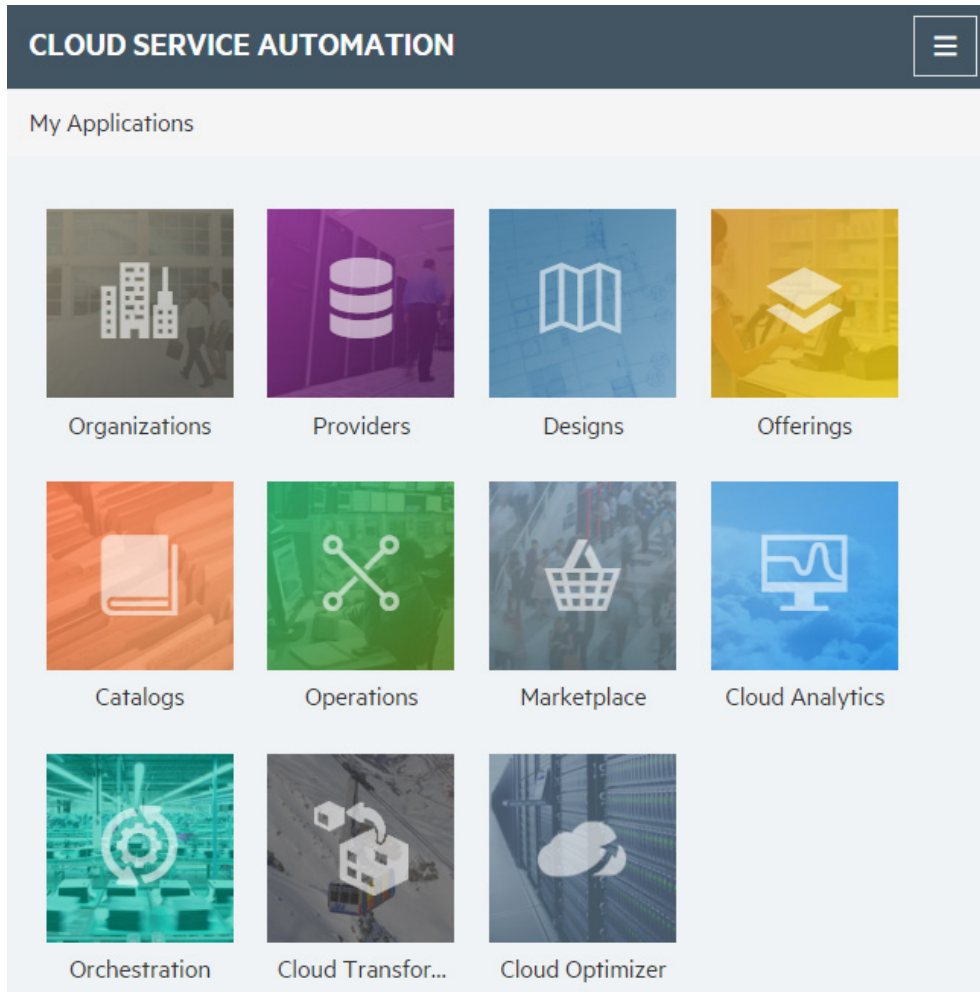

Figure 3 Cloud Service Management Console Dashboard

Deploying HPE CSA with HPE Professional Services

The HPE Professional Services Organization (PSO) provides HPE 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 HPE CSA foundation and its component products. HPE Professional Services can help you integrate HPE CSA into your existing business processes, developing customized solutions that meet the needs of your organization.

HPE CSA can be extended and customized to integrate into your business processes. Most high level HPE CSA objects and entities can be customized to some degree. You can use the Cloud Service Management Console to extend the following HPE 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 HPE Database and Middleware Automation (HPE DMA). To do this, you create a provider type, populating this new type with resource providers, such as specific HPE 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 for sequenced designs: 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 for sequenced designs: 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 HPE OO is in place, so that the service design generates the correct calls to HPE 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 HPE CSA Application Program Interface (API): A set of API calls underlie HPE 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 HPE CSA, replacing the Marketplace Portal with their own alternate portal.

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

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

Licenses

The following license types are available:

HPE CSA permanent license only.

HPE Codar permanent license only.

If you install HPE CSA, you must add an HPE CSA license first; if you install HPE Codar, you must install an HPE Codar license first. After you apply a base license, you can add an upgrade license, if desired.

For more information, refer to the HPE Codar Concepts Guide and other documentation available at https://softwaresupport.hp.com/

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