

HP CloudSystem 8.0 Installation and Configuration Guide

About this guide

This information is for use by administrators using **HP CloudSystem Foundation and Enterprise Software 8.0**, who are assigned to configure and provision compute resources for deployment and use in virtual data centers.



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The open source code used by HP CloudSystem is available on the HP web at <http://www.hp.com/software/opensource>.

Contents

1	Welcome to HP CloudSystem.....	5
	Explanation of solution components.....	6
	Management hypervisors and integrated tools.....	7
	CloudSystem Foundation components.....	8
	CloudSystem Enterprise components.....	8
	CloudSystem networks.....	9
2	Before you begin.....	10
	Audience.....	10
	Assumptions.....	10
3	HP CloudSystem installation prerequisites.....	11
	Understand the installation process.....	11
	Hardware requirements.....	12
	Physical configuration hardware requirements.....	12
	Management hypervisors.....	12
	Compute nodes.....	13
	SAN and Storage.....	14
	Virtual appliance requirements — CloudSystem virtual appliances.....	14
	Software requirements.....	15
	Networking requirements.....	15
	Overview of network topology.....	16
	Network definitions.....	17
	Configuration of management networks.....	18
	Browser requirements.....	19
	Tools requirements.....	20
4	Prepare for the installation.....	21
	Installation kits.....	21
	Contents of CloudSystem .zip files.....	21
	Preparing to install on ESX.....	23
	Preparing to install on KVM.....	24
5	Installing CloudSystem on an ESX cluster.....	26
	Understanding the network infrastructure.....	26
	Create the ESX management hypervisor and configure the network infrastructure.....	27
	Configuring the ESX management environment.....	28
	Selecting hypervisor security level for CloudSystem installation.....	29
	Configuring the Foundation base appliance on ESX.....	29
6	Installing CloudSystem on a KVM hypervisor.....	33
	Creating the management hypervisor.....	33
	Preparing the hardware.....	33
	Installing RHEL.....	33
	Creating a local YUM repository and validating RHEL RPMs.....	34
	Configuring the CloudSystem network infrastructure.....	35
	Configure the network infrastructure on the KVM management hypervisor.....	36
	Configuring the KVM management environment.....	40
	Selecting hypervisor security level for CloudSystem installation.....	40
	Configuring the Foundation base appliance on KVM.....	41
7	Setting up the CloudSystem Console for the first time.....	44
	Configuring cloud networking.....	44
	Performing time synchronization on the Foundation base appliance.....	44

8 CloudSystem Foundation installation next steps.....	46
9 Preparing HP Operations Orchestration for CloudSystem Foundation.....	47
Using OO Central.....	47
Installing OO Studio	47
10 Installing CloudSystem Enterprise.....	49
Installing the Enterprise appliance.....	49
11 Troubleshoot installation issues.....	52
Basic troubleshooting techniques.....	52
csstart errors.....	53
OO Studio installation errors.....	55
Enterprise upgrade errors.....	55
12 Support and other resources.....	57
Information to collect before contacting HP.....	57
How to contact HP.....	57
Registering for software technical support and update service.....	57
HP authorized resellers.....	58
Documentation feedback.....	58
Related information.....	58
HP CloudSystem documents.....	58
HP Software documents.....	59
Finding documents on the HP Software Product Manuals web site.....	59
HP Insight Management documents.....	59
Third-party documents.....	59
HP 3PAR StoreServ Storage documents.....	60
Finding documents on the HP Support Center web site.....	60
HP ProLiant servers documents.....	61
A Command line interfaces.....	62
Preparing to use CLIs.....	62
Installing OpenStack CLIs on Windows.....	62
Installing OpenStack CLIs on Linux.....	62
Using CLI commands.....	63
csstart commands.....	63
csadmin CLI and OpenStack CLI.....	64
Additional CLI tasks.....	64
Using the csstart CLI to install the Foundation base appliance.....	64
Enabling REST API for storage drivers.....	66
Using the CLI to access the Enterprise console.....	66
B Configuring additional providers for CloudSystem Enterprise.....	67
Configuring HP Operations Orchestration to integrate with HP CSA.....	67
Importing Operations Orchestration flows.....	69
Importing a service design.....	70
Configuring a Matrix OE resource provider.....	71
C Configuring a large-scale CloudSystem deployment.....	72

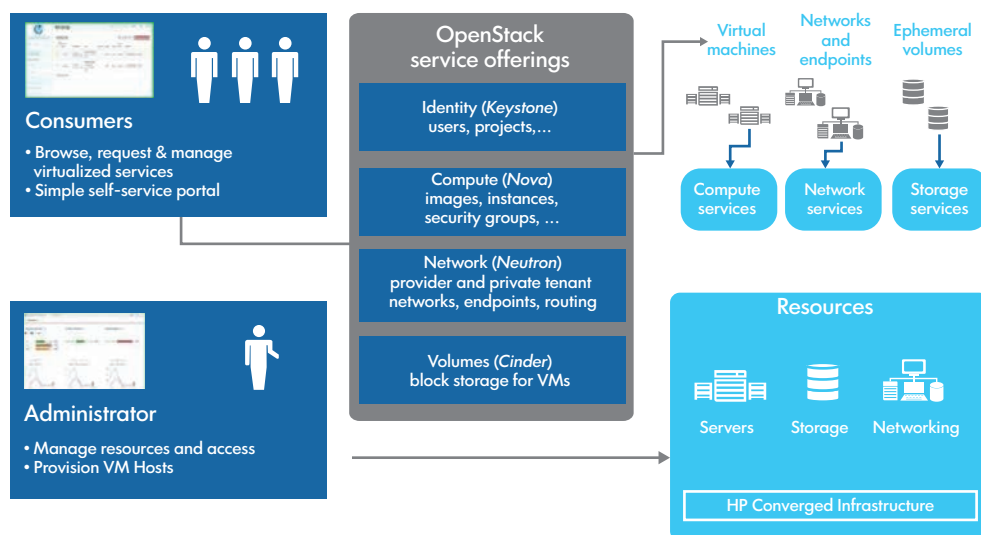
1 Welcome to HP CloudSystem

HP CloudSystem provides a software-defined approach to managing the cloud in a converged infrastructure environment. CloudSystem consists of two offerings:

- **HP CloudSystem Foundation** is based on the HP Cloud OS distribution of OpenStack Cloud Software. It integrates hardware and software to deliver core Infrastructure as a Service (IaaS) provisioning and lifecycle management of compute, network and storage resources. You can manage CloudSystem Foundation from an administrative console, self-service portal, CLIs, and OpenStack APIs. It provides an appliance-based deployment console to simplify installation and maintenance, and an embedded version of HP Operations Orchestration (OO) for automating administrative processes.

See [CloudSystem Foundation components \(page 8\)](#).

Figure 1 CloudSystem Foundation

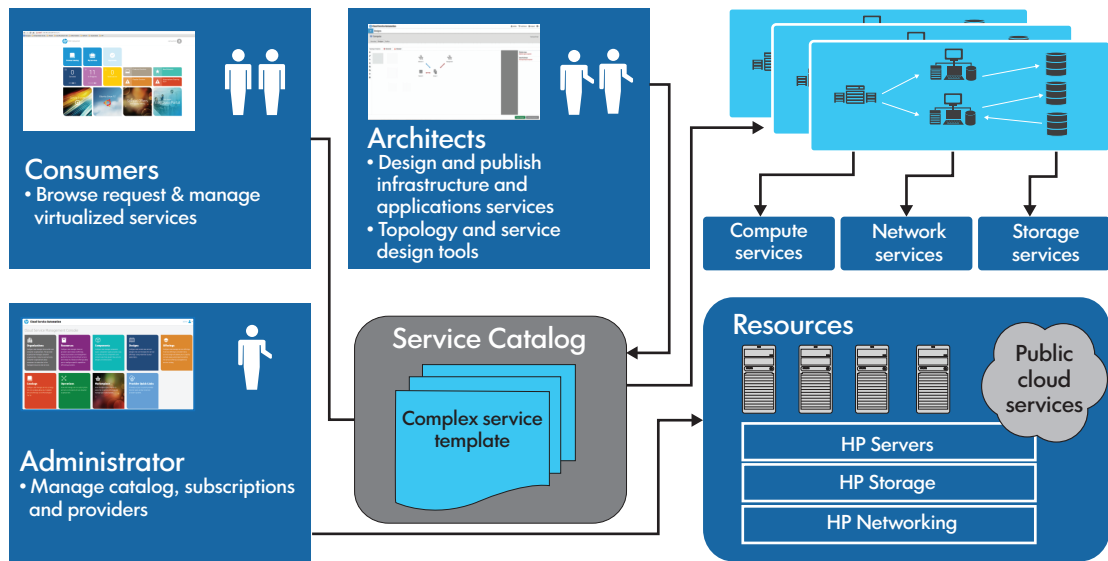


- **HP CloudSystem Enterprise** expands on CloudSystem Foundation to integrate servers, storage, networking, security, and management to automate the lifecycle for hybrid service delivery. Template architects can use Enterprise to create infrastructure templates and offer them as services in a Marketplace Portal. Users select services from a catalog and manage their subscriptions. When a service is requested, Enterprise automatically provisions the servers, storage, and networking. Enterprise also includes an enhanced set of Operations Orchestration workflows.

CloudSystem Enterprise provides a hybrid cloud management platform where you can manage all cloud services.

See [CloudSystem Enterprise components \(page 8\)](#).

Figure 2 CloudSystem Enterprise

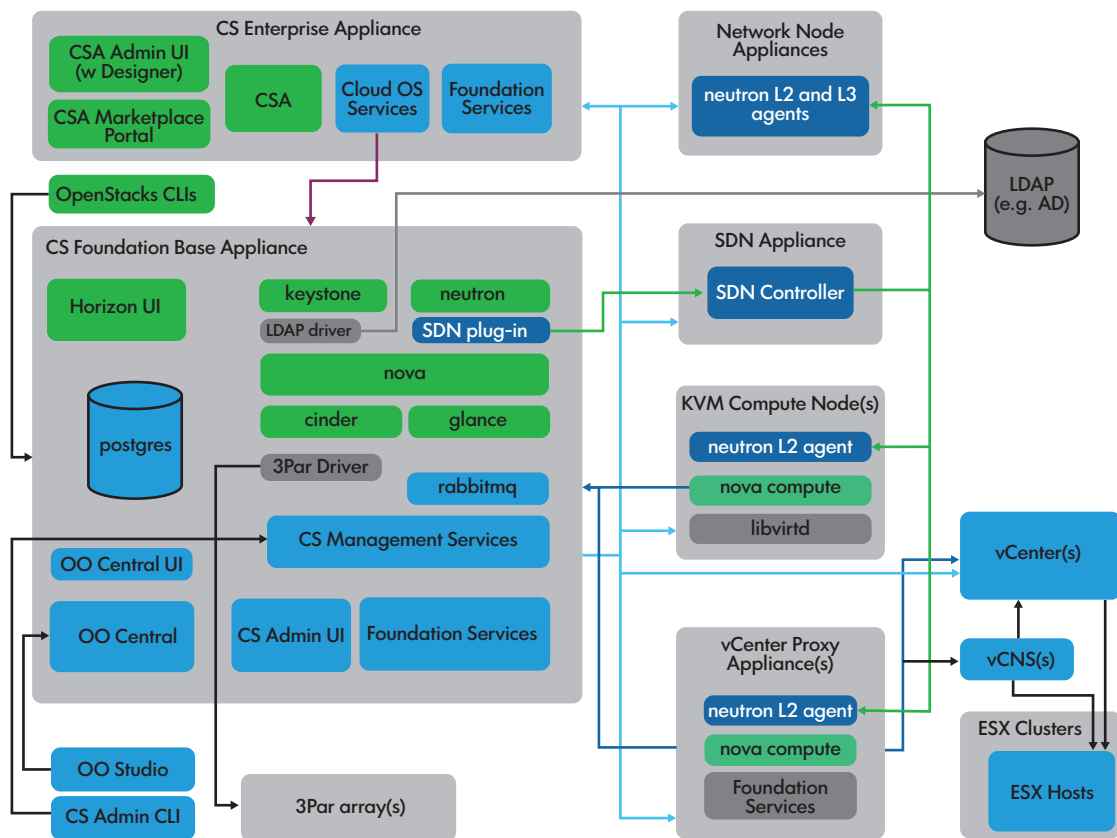


Explanation of solution components

The components of CloudSystem Foundation and CloudSystem Enterprise are explained below.

- [Management hypervisors and integrated tools \(page 7\)](#)
- [CloudSystem Foundation components \(page 8\)](#)
- [CloudSystem Enterprise components \(page 8\)](#)
- [CloudSystem networks \(page 9\)](#)

Figure 3 CloudSystem architecture



Management hypervisors and integrated tools

- **Management hypervisors** host the various virtual machine appliances that make up the CloudSystem solution. Both ESX and KVM hypervisors are supported.
- **VMware vCenter Server** acts as a central administrator for ESX clusters that are connected on a network. vCenter Server allows you to pool and manage the resources of multiple hosts, as well as monitor and manage your physical and virtual infrastructure. You can import and activate ESX clusters in the CloudSystem Console after you register a connection with vCenter Server.
VMware vCloud Networking and Security (**vCNS**) provides security for the ESX compute hosts.
- An **HP 3PAR storage system** provides a method of carving storage for boot and data disks. Block storage drivers are imported from the HP 3PAR storage system to the CloudSystem Console.
- An **FC SAN**, **ISCSI** or **Flat SAN** connects the HP 3PAR storage system to compute nodes or ESX clusters.

CloudSystem Foundation components

- **CloudSystem Foundation** is the IaaS solution used for provisioning virtual machine instances. Management tasks for both Foundation and Enterprise are performed from Foundation's CloudSystem Console. Foundation includes the following components, which all run on virtual machines on one or more management hypervisors:
 - The Foundation **base appliance** contains the core services and functionality of the CloudSystem Console. The CloudSystem Portal, OpenStack services, OO Central and supporting CLIs also reside on the Foundation base appliance.
 - The **SDN** (Software Defined Networking) **appliance** is the control center for the network infrastructure of the Foundation base appliance. When the OpenStack Neutron service needs to define a new router or a plugin on the Foundation base appliance, the request is sent to the SDN appliance.

CloudSystem Foundation automatically creates the SDN appliance after the Foundation base appliance is installed and the Cloud Networking settings are saved in the CloudSystem Console.
 - The **network node appliances** manage various network services, such as DHCP and L3 (routing) services, for provisioned virtual machines and provisioned virtual networks. The SDN appliance manages the network node appliances as a cluster. When the SDN appliance receives a request to create a new router, it creates the router in one of the network node appliances.

Multiple network node appliances are created during installation, after the base appliance is installed and Cloud Networking settings are saved in the CloudSystem Console.
 - A **vCenter proxy appliance** supports ESX configurations. OpenStack Nova and Neutron agents reside in the vCenter proxy appliance, which acts as a proxy for the ESX management hypervisor. The management hypervisor accepts each vCenter Server cluster as one large compute node. This configuration allows your cloud to take advantage of HA and load balancing features supported in vCenter Server.

The vCenter proxy appliance runs the OpenStack agents for up to 12 ESX clusters. Foundation automatically creates the first vCenter proxy appliance when the first ESX cluster is activated in the CloudSystem Console.
 - The **CloudSystem Console** GUI supports administrative tasks, such as creating storage templates, activating compute nodes, setting up networks, monitoring the Foundation base appliance, and performing maintenance tasks on the appliance.
 - The **CloudSystem Portal** GUI is accessed from a modified Foundation base appliance URL by appending **portal** to the Foundation IP address. Example:
`https://Foundation_IP/portal`. Instances are created and managed from this portal.
 - **HP Operations Orchestration (OO) Central** provides the ability to run scripted workflows on the Foundation base appliance. Access OO Central from the Integrated Tools screen in the CloudSystem Console.

HP OO Studio provides the ability to edit the OO workflows. It has a separate installer, which is included in the HP CloudSystem-OO-Studio-8.0.0.20 zip file.
See [Preparing HP Operations Orchestration for CloudSystem Foundation \(page 47\)](#).

CloudSystem Enterprise components

- **HP CloudSystem Enterprise** expands on CloudSystem Foundation by integrating servers, storage, networking, security, and management to automate the lifecycle for hybrid service delivery. Template architects use Enterprise to create infrastructure templates, which are offered as services in the Marketplace Portal. When a cloud user requests a service from the catalog, Enterprise automatically provisions the servers, storage, and networking designed in the service.

Enterprise is installed from Foundation and uses the Foundation platform to conduct management tasks. Enterprise includes the following components:

- The **Enterprise appliance** contains the core functionality of the Enterprise offering, including HP Cloud Service Automation (HP CSA), the Marketplace Portal, Topology Designer and Sequential Designer.
 - The **Marketplace Portal** displays offerings that can be purchased and applied to a cloud environment.
 - Enterprise includes two designers, **Topology Design** and **Sequential Design**. The Topology Designer is an easy to use solution for infrastructure provisioning designs. Sequential Designer handles more complex application provisioning designs. Designs from both designers are offered as services in the Marketplace Portal.
 - **HP CSA** is the administrative portal for the Enterprise appliance. Designs are created in the HP CSA portal.

CloudSystem networks

See [Network definitions \(page 17\)](#).

2 Before you begin

HP CloudSystem is a flexible cloud management solution that supports multiple installation options. This guide does not cover all possible options. If the installation required by your organization does not match the installation described in this guide, contact an HP Support representative for assistance.

Audience

This guide is intended for experienced system administrators with a working knowledge of the following concepts.

- TOR switches for networking
- CLI commands for Windows and Linux
- VMware vCenter Server functionality, if using ESX hypervisors and compute nodes
- VMware distributed and standard vSwitches
- Red Hat KVM hypervisor configuration and use

If you plan to use the OpenStack CLI and APIs to manage some of the cloud resources from the command line, it is helpful to have experience with OpenStack technologies such as Nova, Glance, Cinder and Neutron.

Assumptions

This installation guide makes the following assumptions about your readiness for the installation. Make sure these assumptions match the state of your environment before you begin the installation.

- All hardware required to support a CloudSystem installation is installed and configured. You can use the requirements chapter to verify this before installation. See [HP CloudSystem installation prerequisites \(page 11\)](#).
- If you are using ESX, then VMware vCenter Server is installed and ready to connect to CloudSystem.
- If you plan to use block storage, then an HP 3PAR storage system is configured and ready to connect to CloudSystem.
- You have a list of user names and passwords for VMware vCenter Server and HP 3PAR storage system.
- You have a set of IP addresses that you can assign to CloudSystem virtual appliances.

Next steps: [HP CloudSystem installation prerequisites \(page 11\)](#).

3 HP CloudSystem installation prerequisites

This chapter outlines the recommended and minimum hardware and software requirements, the networking pre-configuration, and the solution integration tools that must be in place before installing CloudSystem.

[Hardware requirements \(page 12\)](#)

[Software requirements \(page 15\)](#)

[Networking requirements \(page 15\)](#)

[Browser requirements \(page 19\)](#)

[Tools requirements \(page 20\)](#)

Understand the installation process

A high-level overview of the CloudSystem installation path is provided in the table below. The **Additional resources** column contains links to information in this guide, as well as information from other documentation sources.

Table 1 Installation process

<input checked="" type="checkbox"/>	Installation step	Additional resources
	Verify that the target environment satisfies the hardware, software, and networking prerequisites described in this guide.	See Hardware requirements (page 12) Software requirements (page 15) Networking requirements (page 15)
	Configure the HP 3PAR storage system to support storage requirements for compute nodes and virtual machine instances. This guide does not cover the specific steps required to accomplish this. <ul style="list-style-type: none">• The 3PAR storage system server certificate must contain a Fully Qualified Domain Name (FQDN) in the CN attribute Subject field.• For block storage volumes, use the OpenStack interfaces that are dependent on block storage support.• For ephemeral storage, define the storage in the flavor definitions.	See Openstack Cinder documentation HP 3PAR documentation
	Set up the management hypervisor solution (ESX or KVM) per CloudSystem requirements. If using ESX, configure vCenter Server.	See Installing CloudSystem on an ESX cluster (page 26) Installing CloudSystem on a KVM hypervisor (page 33) VMware vSphere Documentation at VMware
	Use csstart to deploy the Foundation base appliance.	See Configuring the ESX management environment (page 28) Configuring the KVM management environment (page 40)
	Enter and save Cloud Networking settings in the CloudSystem Console.	See Setting up the CloudSystem Console for the first time (page 44)
	Optional: Install OO Studio, if you want to customize workflows.	See Preparing HP Operations Orchestration for CloudSystem Foundation (page 47)
	Optional: Install CloudSystem Enterprise.	See Installing CloudSystem Enterprise (page 49)

Table 1 Installation process (continued)

<input checked="" type="checkbox"/>	Installation step	Additional resources
	Stage and prepare compute nodes. This guide does not cover the specific steps required to accomplish this.	See "Resource Configuration in CloudSystem Foundation: Compute node creation" in the <i>HP CloudSystem 8.0 Administrator Guide</i> at Enterprise Information Library
	Build and manage cloud resources. This guide does not cover the specific steps required to accomplish this.	See "Cloud service provisioning, deployment, and service management in CloudSystem" in the <i>HP CloudSystem 8.0 Administrator Guide</i> at Enterprise Information Library

Hardware requirements

Hardware requirements for management hypervisors, compute nodes, virtual appliances, and SAN and Storage are provided in this section.

Physical configuration hardware requirements

Management hypervisors

The following table lists the recommended and minimum hardware requirements for a single ESX or KVM management hypervisor. Only HP servers are supported as management hypervisors.

In an HA configuration, both the primary and failover hypervisors must meet the hardware requirements described in this table.

Table 2 Management hypervisor hardware requirements

Requirements	Cores	RAM	Storage
Recommended	16 cores	128 GB	See the formula below.
Minimum supported	8 cores	96 GB	See the formula below.

Formula to determine the storage requirements for the management hypervisor

The formula used to determine the management hypervisor storage requirements is *appliance storage + glance images/snapshots = management hypervisor storage*

- appliance storage: **600 GB**
 - 25 GB for templates
 - 160 GB (3) for the Foundation base appliance, vCenter proxy appliance and Enterprise appliance
 - 20 GB (3) for the network node appliances
 - 25 GB for the SDN appliance
- glance images/snapshots: **varies**

Table 3 Glance repository sizing guidelines

Glance repository	Linux images (4 GB each)	Windows images (16 GB each)	Snapshots (20 GB each)	TOTAL
Small	15	10	15	520 GB
Medium	20	15	40	1.2 TB
Large	25	30	500	10.1 TB

Use the links in the table below to verify component compatibility and find a list of supported hardware.

Table 4 Verify compatibility and supported versions

Additional resources	Use this to...	Where do I find it...
HP Insight Management Support Matrix version 7.3.1	Refer to the supported HP servers tables. CloudSystem supports all servers supported in the HP Matrix Operating Environment, version 7.3.1. <ul style="list-style-type: none"> • Table 26 • Table 28 • Table 29 • Table 30 The server must have a check in the Matrix OE column.	http://www.hp.com/go/insightmanagement/docs
HP Support Center	Verify the compatibility of the servers, drivers, firmware and software	http://www.hp.com/go/hpsc
HP Customized ESXi images for management hypervisor	Find customized ESXi images. Supported versions are 5.0 Update 3, 5.1 Update 2, and 5.5.	http://h18004.www1.hp.com/products/servers/software/vmware/esxi-image.html

Compute nodes

Compute node sizes vary according to your resource needs. The following questions are provided to guide you as you determine the size of your compute node.

- What flavor settings will the provisioned instances use?
- What oversubscription rate is supported for each compute resource? See the **Compute Node Management** chapter in the *HP CloudSystem 8.0 Administrator Guide* at [Enterprise Information Library](#).
- How many instances will each compute node support?

After answering the questions above, determine the amount of CPU cores, memory, and storage to allocate to each compute node. You can also use the **HP Sizer for Server Virtualization** website to determine hypervisor sizing for compute nodes.

Table 5 Hardware requirements

Additional resources	Use this to...	Where do I find it...
HP Sizer for Server Virtualization website	Find details on sizing hypervisors for compute nodes	http://h71019.www7.hp.com/ActiveAnswers/us/en/size

Use the links in the table below to verify component compatibility and find a list of supported hardware.

Table 6 Verify compatibility and supported versions

Additional resources	Use this to...	Where do I find it...
HP Insight Management Support Matrix version 7.3.1	Refer to the supported HP servers tables. CloudSystem supports all servers supported in the HP Matrix Operating Environment, version 7.3.1. <ul style="list-style-type: none"> • Table 26 • Table 28 • Table 29 • Table 30 The server must have a check in the Matrix OE column.	http://www.hp.com/go/insightmanagement/docs
HP Support Center	Verify the compatibility of your servers, drivers, firmware and software	http://www.hp.com/go/hpsc

SAN and Storage

The table below contains SAN and storage requirements for ephemeral and block storage.

Table 7 Hardware requirements

Requirements	Purpose	Find more information...
Ephemeral storage	This storage is used for provisioned instances and is defined in the flavor. When an instance is deleted, this storage is released.	See HP Matrix Operating Environment, version 7.3.1. http://www.hp.com/go/insightmanagement/docs <ul style="list-style-type: none"> • Chapter 4 Managed system hardware
Block storage 3 PAR F-Class, P7000, P10000 series Fibre Channel fabric support <ul style="list-style-type: none"> • pre-configured zones where storage system is zoned to the appropriate virtual machine host • open zoning where no zoning configuration is enabled FC SAN iSCSI Flat SAN NOTE: REST API interface must be enabled on the HP 3PAR storage system.	Block storage allocates storage to virtual machine instances (attach/detach). Storage is presented to a single instance via the compute node where the instance is hosted.	See HP 3PAR documentation

Virtual appliance requirements — CloudSystem virtual appliances

The table below lists all CloudSystem virtual appliances, along with compute, memory and storage requirements.

Table 8 Hardware requirements

Virtual appliance	Cores	RAM	Storage
Foundation base appliance	8vCPUs	32 GB	160 GB (Thin Provisioned) Glance image storage of 2–4 TB is provided by a

Table 8 Hardware requirements *(continued)*

Virtual appliance	Cores	RAM	Storage
			separate mounted volume in a production environment.
SDN appliance (Foundation)	4vCPUs	8 GB	25 GB (Thin Provisioned)
network node appliances (Foundation)	3(2vCPUs)	3(4 GB)	3(21 GB) (Thin Provisioned)
vCenter proxy appliance (Foundation) NOTE: 1 vCenter proxy appliance is required for every VMware vCenter Server	4vCPUs	16 GB	160 GB (Thin Provisioned)
Enterprise appliance	8vCPUs	16 GB	160 GB (Thin Provisioned)
Total of all Foundation and Enterprise appliances	30 vCPUs (15 cores)	84 GB	568 GB (Thin Provisioned)

Software requirements

Refer to the table below for a list of supported software versions.

Software	Version	Location
3PAR Inform	Inform OS 3.1.2 MU2	Contact your HP 3PAR support representative for additional information.
VMware vSphere	ESXi 5.0.3, 5.1.2 and 5.5b (Custom HP image) For ESXi hosts, 5.5 is supported, instead of 5.5b	Available from http://software.hp.com . Select the virtualization software link.
VMware vCloud Networking and Security (vCNS) Required on ESX compute nodes to support security groups for provisioned instances.	5.5	See Third-party documents (page 59)
Red Hat Enterprise Linux	6.4	See Third-party documents (page 59)
OO Studio	10.02	The upgrade executable file is available in the OO Studio zip file. System requirements must be met to support the upgrade to OO Studio. You can confirm requirements here: HP Orchestration Operations System Requirements document

Networking requirements

Before installing CloudSystem, plan for the following networks.

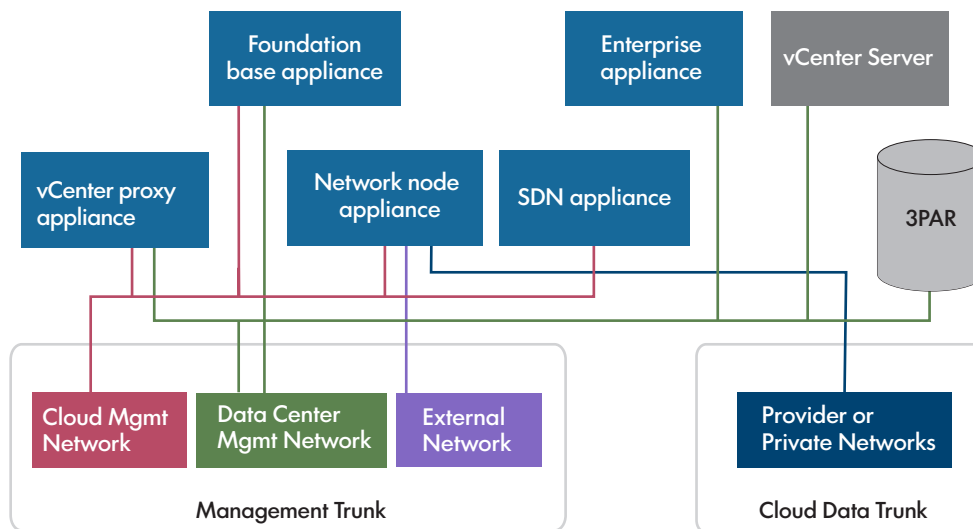
Table 9 Network planning

<input checked="" type="checkbox"/>	Network	Number	Purpose	Connected to...
	Data Center Management Network	1	This network connects virtual appliances to HP 3PAR, VMware vCenter Server, VMware vCloud Networking and Security (vCNS) and enclosures.	Foundation base appliance VMware proxy appliance Enterprise appliance VMware vCenter Server
	Cloud Management Network	1	This network connects the Foundation base appliance, vCenter proxy appliance, network node appliances, SDN appliance and KVM compute nodes. This is a private network.	Foundation base appliance SDN appliance network node appliances VMware proxy appliance KVM compute nodes
	External Network	1	This network allows cloud end users to attach public IP addresses to their provisioned virtual machine instances.	network node appliances
	Provider Networks and/or Private Networks	at least 1	A Provider Network is a data center network routed through the existing data center infrastructure. A Private Network is created from a pool of VLANs. Both networks support instance communication.	Cloud Data Trunk network node appliances

Overview of network topology

Networks are organized into two trunks. The **Management trunk** holds all infrastructure networks that connect the virtual appliances, vCenter Server and the HP 3PAR storage system. The **Cloud Data Trunk** holds the networks that connect provisioned virtual machines to the cloud.

Figure 4 Network trunks




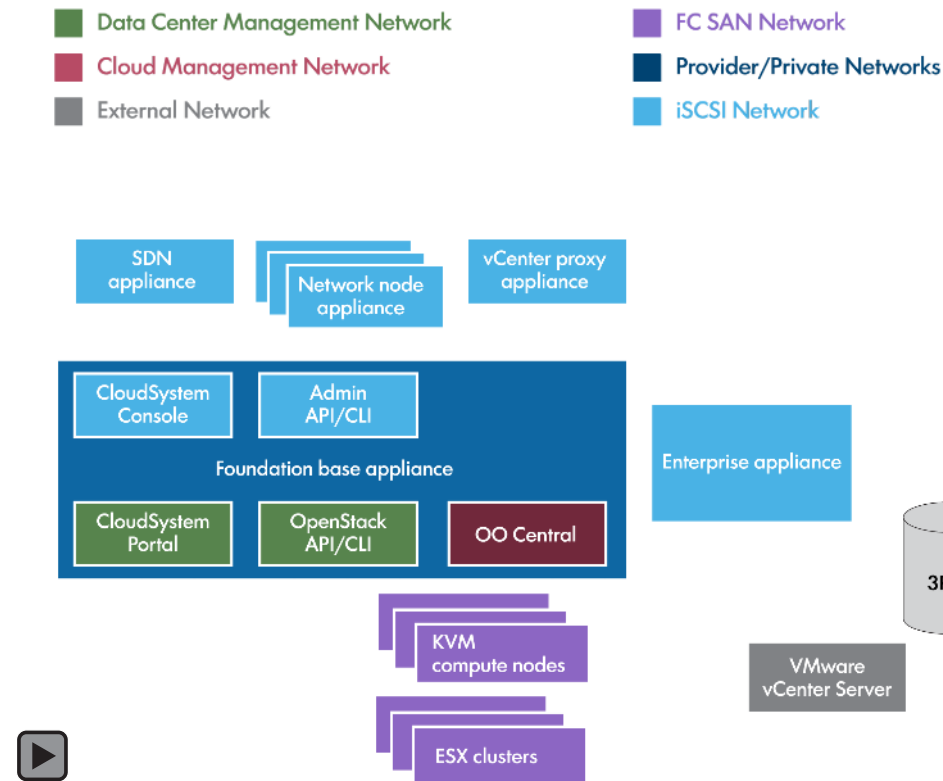
You can use the following interactive graphic to see how each network connects to the CloudSystem virtual appliances. Click the play button  to enable the graphic, then click a network name to see which virtual appliances are supported by the network.

Figure 5 Interactive network diagram

Click a network name to see it attach to the virtual appliances.



Network definitions

Management Trunk

The Management trunk contains the following networks.

- **Data Center Management Network:** This network provides access to the CloudSystem Console, which is the interface for the Foundation base appliance. REST APIs calls are made from this

network. The Foundation base appliance and the Enterprise appliance access vCenter Server and the HP 3PAR storage system over this network.

Three or more vCenter Server are supported.

- The Foundation base appliance uses this network to access the vCenter Server that is managing the management hypervisor.
- The vCenter proxy appliance uses this network to access the vCenter Server that is managing ESX compute clusters. This can be a separate vCenter Server or the same vCenter Server used by the Foundation base appliance.
- The Enterprise appliance also uses this network to access vCenter Server. Enterprise can be configured to use a third vCenter Server, or it can access one of the two existing vCenter Servers.

- **Cloud Management Network:** This private network for the cloud is typically a VLAN, but could also be a physical network. The Foundation base appliance runs a DHCP server for this network.

❗ **IMPORTANT:** The Cloud Management Network should be a dedicated private network for Cloud System Management use only. Some of the contents transmitted between compute nodes and the cloud controller are unencrypted. Network isolation should be used to prevent unwanted exposure to sensitive data.

- **External Network:** This network is automatically connected to the network node appliances after Cloud Networking settings are saved during the CloudSystem Console first time setup. Subnets must be defined in the CloudSystem Portal before using this network.

Virtual machines are not connected directly to this network. Internal provider or private networks connect directly to a virtual machine, then a virtual router is used to connect the internal and external networks. A networking service routes outgoing traffic to the External Network. When the External Network subnet assigns Floating IPs to virtual machines, then the External Network can access them.

Cloud Data Trunk

This network must be configured as a group of VLANs. It hosts the VLANs that OpenStack networking makes available to users. CloudSystem uses specific VLANs on this trunk as Private Networks. Some VLANs may not be dedicated to CloudSystem. All compute nodes in the cloud must be connected to this network.

The Cloud Data Trunk contains the following production networks.

- **Provider Network:** A Provider Network is a data center network routed through the existing data center infrastructure. Adding a Provider Network allows you to add an existing data center network to any number of virtual machine instances in the cloud.
- **Private Networks:** Private Networks are created from a pool of VLANs. The cloud administrator configures this pool in the CloudSystem Console. Then, when the cloud administrator switches to the CloudSystem Portal and creates a Private Networks, the OpenStack Neutron networking service assigns a VLAN from the pool.

OpenStack Neutron networking manages all aspects of this network, including external routing.

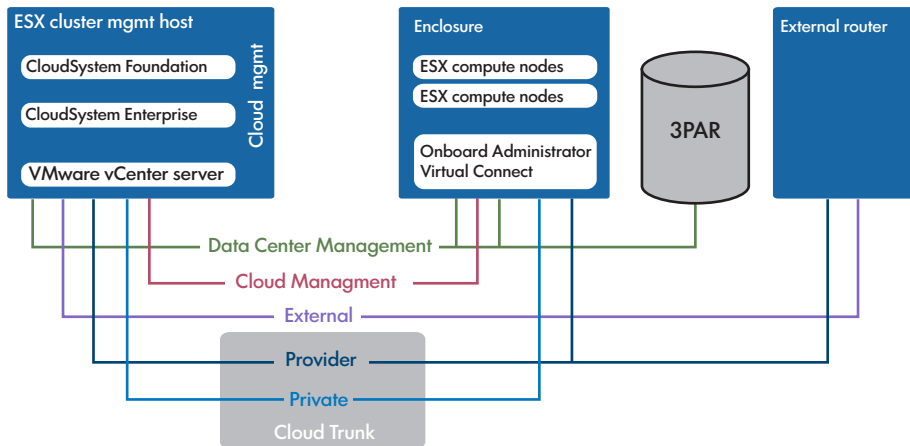
❗ **IMPORTANT:** All of the networks described above must be distinct networks, with the exception of the **External Network**. You can use the same network for the External Network and the Data Center Management Network.

Configuration of management networks

Management network configuration varies depending on the management hypervisor configuration.

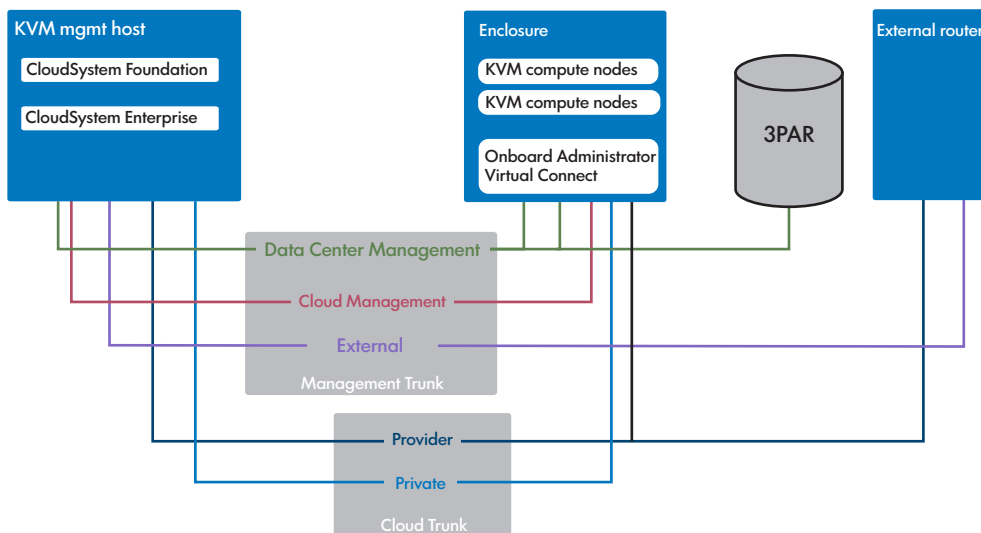
The following figure shows a sample configuration with an ESX management host, networks and ESX compute nodes.

Figure 6 ESX management host with ESX compute nodes



The following figure shows a sample configuration with a KVM management host, networks and KVM compute nodes.

Figure 7 KVM management host with KVM compute nodes



For a detailed explanation of the network configuration, see

[Installing CloudSystem on an ESX cluster \(page 26\)](#)

[Installing CloudSystem on a KVM hypervisor \(page 33\)](#)

Browser requirements

The following browsers are supported for the CloudSystem installation.

Vendor	Product	Version
Microsoft	Internet Explorer	9, 10
Mozilla	Firefox Extended Support Release (ESR)	24

Vendor	Product	Version
	Personal Edition	Latest version
Google	Chrome	33

Tools requirements

The CloudSystem-Tools-8.0.0.20.zip file contains a `csstart` installation script and several CLI packages. The requirements for the systems running these tools are listed in the table below.

CloudSystem Tool	Product	Version
csstart	Windows	Version 7, 2008 R2 (32-bit and 64-bit)
	Linux	RHEL 6.4
CLI packages	Windows	Version 7, 2008 R2 (32-bit and 64-bit)
	Linux	CentOS 6.2, 6.3, 6.4, Ubuntu 12.04

Next step: [Prepare for the installation \(page 21\)](#)

4 Prepare for the installation

Before you begin the installation, it is important to have all of the required images and tools unpacked and staged. The installation path varies, depending on whether you are installing CloudSystem on an ESX or KVM management hypervisor.

- [Installation kits \(page 21\)](#)
- [Preparing to install on ESX \(page 23\)](#)
- [Preparing to install on KVM \(page 24\)](#)

Installation kits

Download the CloudSystem release kit from HP Software Depot at <http://software.hp.com>.

There are six .zip files that contain the installation components needed for CloudSystem Foundation and CloudSystem Enterprise. The installation components vary, depending on the type of management hypervisor you plan to install. The table below shows the .zip files and which installation path they support.

Table 10 Components included in HP CloudSystem zip files

Installation components	Foundation ESX	Foundation KVM	Enterprise ESX	Enterprise KVM
HP CloudSystem Foundation ESX 8.0 Mar 2014 (contains ESX images for base, SDN appliance, and network node appliances)	x		x	
HP CloudSystem Foundation KVM 8.0 Mar 2014 (contains KVM images for base, SDN appliance, and network node appliances)		x		x
HP CloudSystem Enterprise ESX 8.0 Mar 2014 (contains the ESX image for the Enterprise appliance)			x	
HP CloudSystem Enterprise KVM 8.0 Mar 2014 (contains the KVM image for the Enterprise appliance)				x
HP CloudSystem Tools 8.0 Mar 2014 (contains the csstart installation script and the CLI packages))	x	x	x	x
HP CloudSystem OO Studio 8.0 Mar 2014 (contains OO content packs and OO Studio installation and upgrade)	x	x	x	x

Signature files

Each zip file has a corresponding signature file. Signature files are used to verify the authenticity of the downloaded files.

See [HP GPG or RPM signature Verification](#).

Contents of CloudSystem .zip files

The contents of each CloudSystem .zip file are described in the following section.

NOTE: Each `qcow2` file comes with a corresponding `sha1` checksum file. When `csstart` runs, it uses the checksum file to verify that the files are copied to the hypervisor without errors.

HP CloudSystem Foundation ESX-8.0 Mar 2014 `Z7550-01317.zip`

- **CS-Base-8.0.0.20.ova:** Open Virtualization Format (OVF) package for the base appliance on an ESX hypervisor.
- **CS-Base-8.0.0.20.ova:** OVF package for the SDN appliance on an ESX hypervisor.
- **CS-NN-8.0.0.20.ova:** OVF package for the network node appliance on an ESX hypervisor.

HP CloudSystem Foundation KVM 8.0 Mar 2014 `Z7550-01318.zip`

- **CS-Base-8.0.0.20.qcow2:** Disk image for the base appliance on a KVM hypervisor.
- **CS-SDN-8.0.0.20.qcow2:** Disk image for the SDN appliance on a KVM hypervisor.
- **CS-NN-8.0.0.20.qcow2:** Disk image for the network node appliance on a KVM hypervisor.

NOTE: Each `qcow2` file comes with a corresponding `sha1` checksum file. When `csstart` runs, it uses the checksum file to verify that the files are copied to the hypervisor without error.

HP CloudSystem Enterprise ESX 8.0 Mar 2014 `Z7550-01323.zip`

- **CS-Enterprise-8.0.0.20.ova:** OVF package for the Enterprise appliance on an ESX hypervisor.

HP CloudSystem Enterprise KVM 8.0 Mar 2014 `Z7550-01324.zip`

- **CS-Enterprise-8.0.0.20.qcow2:** Disk image for the Enterprise appliance on a KVM hypervisor.

NOTE: Each `qcow2` file comes with a corresponding `sha1` checksum file. When `csstart` runs, it uses the checksum file to verify that the files are copied to the hypervisor without error.

HP CloudSystem Tools 8.0 Mar 2014 `Z7550-01325.zip`

- **csstartgui-secure.bat:** Program used to deploy and configure the management appliances on the management host. When `csstart` runs, it verifies the SSL certificate from the hypervisor, and also verifies any additional virtual appliances created. This is for Windows or Linux systems.
- **csstartgui-auto-accept.bat:** Program used to deploy and configure the management appliances on the management host. When `csstart` runs, it does not verify the SSL certificate from the hypervisor, but will inject the certificate into the Foundation base appliance and check all subsequent virtual appliances when they are created. This is for Windows or Linux systems.
- **csstartgui-insecure.bat:** Program used to deploy and configure the management appliances on the management host. When `csstart` runs, it does not verify any certificates for the initial base appliance installation or for subsequent virtual appliances. This is for Windows or Linux systems.
- **csstart-linux.tar:** Contains the command line to install CloudSystem from a Linux system.
- **csstart-windows.zip:** Contains the command line to install CloudSystem from a Windows system. This is packaged as a folder of files, along with three `.bat` files, which are used to invoke the command.
- **csadmin:** Provides Linux command line access to perform administrative functions such as storage management, support dump actions for management virtual appliances, and password setting for management appliance console access.
- **csdamin.exe:** Provides Windows command line access to perform administrative functions such as storage management, support dump actions for management virtual appliances, and password setting for management appliance console access.

- **isc-remote-client-8.0.0.20.msi**: Installs the Windows version of the commands for OpenStack Keystone, Nova, Neutron and Cinder.
- **isc-remote-client-8.0.0.20.rpm**: Installs the Linux version of the commands for OpenStack Keystone, Nova, Neutron and Cinder.
- **rhel-kvm-deps-8.0.0.20.rpm**: When run in a YUM repository, this file checks for required RHEL RPMs and returns a list of any that are missing.

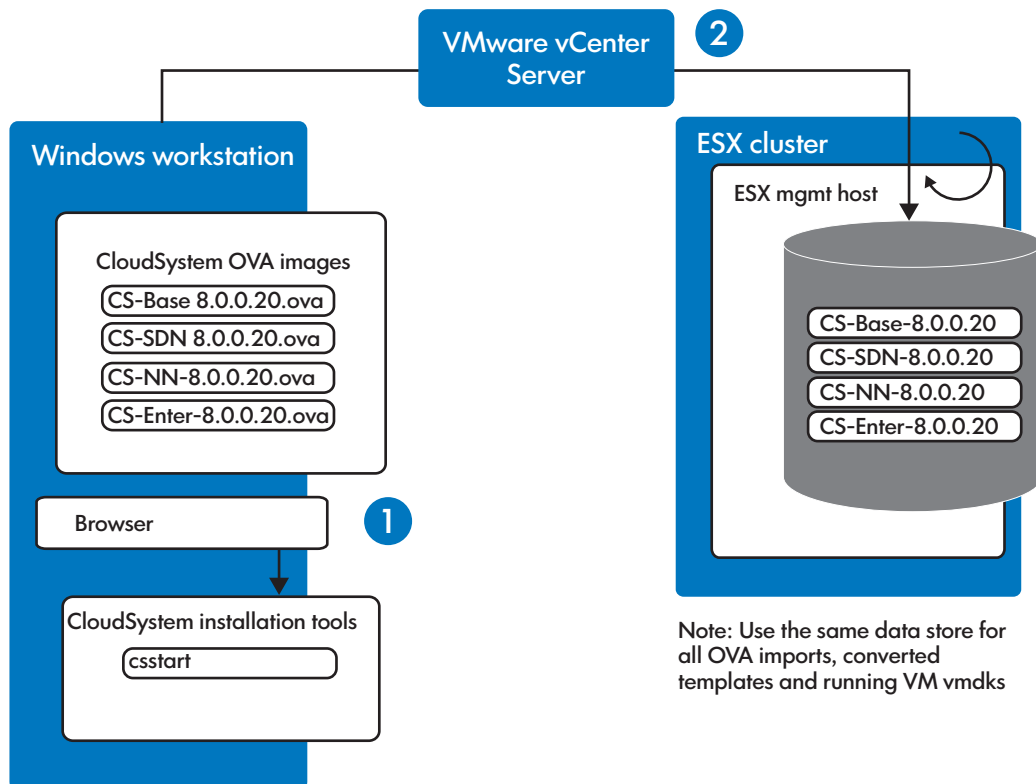
HP CloudSystem OO Studio 8.0 Mar 2014 Z7550-01319.zip

- Content packs that can be installed and edited in OO Studio:
 - OO-HP-Solutions-cp.jar
 - OO-Systems-cp.jar
 - OO-virtualization-cp.jar
 - OO-Base-cp.jar
 - OO-cloud-cp.jar
- **OO-installer.exe**: Used to install OO Studio.
- **OO-studio-upgrade.zip**: Used to upgrade OO Studio to 10.02.

Preparing to install on ESX

This section covers the steps required to download the contents of the release package and stage the files on a Windows workstation. You can also use a Linux workstation to stage the files.

Figure 8 Path to install from a Windows workstation



Prerequisites

- You have a Windows staging server with access to your vCenter Server. Required disk storage is approximately 35GB.
- You have administrator privileges to log in to VMware vCenter Server.

Procedure 1 Downloading .zip files and extracting ESX contents

1. Log on to the Windows workstation.
2. Open a browser and navigate to the HP Software Depot at <http://software.hp.com>.
3. In the Search field, type **CloudSystem**.
4. Select the **HP CloudSystem 8.0** offering.
5. Sign in with your HP Passport or create a new passport account.
6. Accept the license agreement.
7. Follow the HP Software Depot instructions for downloading the release files.
8. Move the following .zip files to the Windows workstation.

The Windows workstation used to stage the files must have access to the vCenter Server that you plan to use to deploy the OVAs.

- **HP CloudSystem-Foundation-ESX-8.0.0.20.zip**
- **HP CloudSystem-Enterprise-ESX-8.0.0.20.zip**
- **HP CloudSystem-Tools-8.0.0.20.zip**

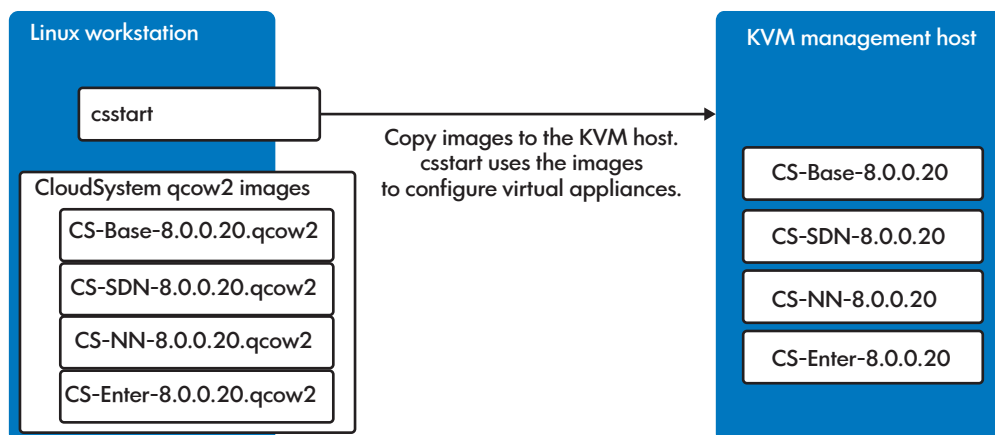
9. Extract the .zip file content on your workstation.
10. Make sure the **csstart** folder and the three **csstart-XXX.bat** files are extracted from the **HP CloudSystem-Tools-8.0.0.20.zip** on your workstation so that you can run them later.

Next step: [Installing CloudSystem on an ESX cluster \(page 26\)](#)

Preparing to install on KVM

This section covers the steps required to download the contents of the release package and stage the files on a Linux workstation. You can also use a Windows workstation to stage the files, but you will need to substitute Windows commands in the procedures below.

Figure 9 Path to install from a Linux workstation



Prerequisites

- You have a Linux workstation to stage the KVM kit and run installation tools. Required disk storage is approximately 35 GB.
- You have administrator privileges to log in to the KVM management hypervisor.

Procedure 2 Downloading .zip files and extracting KVM contents

1. Log on to the Linux workstation.

NOTE: If you prefer, you can use the KVM management host for staging instead of the Linux workstation. Make sure you have at least 3 GB of extra space to stage the kits.

2. Open a browser and navigate to the HP Software Depot at <http://software.hp.com>.
3. In the Search field, type **CloudSystem**.
4. Select the **HP CloudSystem 8.0** offering.
5. Sign in with your HP Passport or create a new passport account.
6. Fill in the required form details and accept the license agreement.
7. Follow the HP Software Depot instructions for downloading the release files.
8. Move **HP CloudSystem Foundation KVM 8.0 Mar 2014**, **HP CloudSystem Enterprise KVM 8.0 Mar 2014** and **HP CloudSystem Tools 8.0 Mar 2014** files to your Linux workstation or KVM management host.
9. Log in to the management hypervisor and run:
`gunzip`
This command unpacks the .zip files.
10. Move the qcow2 image files and the checksum (.sh1) files to the /CloudSystem/images directory.
11. In the **HP CloudSystem Tools 8.0 Mar 2014** file there is a `csstart-linux.tar` file. Unpack the .tar file.
12. Copy **csstart.exe** to any directory on the Linux workstation or KVM management host.

Next step: [Installing CloudSystem on a KVM hypervisor \(page 33\)](#)

5 Installing CloudSystem on an ESX cluster

This chapter contains the procedures required to set up the network infrastructure and install the CloudSystem Foundation base appliance on an ESX management hypervisor. The checklist below provides an overview of the installation path.

Table 11 ESX management hypervisor installation path

<input checked="" type="checkbox"/>	Installation step	Related information
	Create the management host and define the vSwitch or port group IDs and network security settings in vCenter Server.	Understanding the network infrastructure (page 26)
	Choose the type of security checks to perform when running <code>csstart</code> .	Configuring the ESX management environment (page 28)
	Launch <code>csstart</code> and install the Foundation base appliance.	Configuring the Foundation base appliance on ESX (page 32)

Understanding the network infrastructure

Multiple networks provide the communication platform for CloudSystem, vCenter Server and the HP 3PAR storage system. The configuration of the networks is flexible. This section explains the major components of the networking infrastructure and provides an example of a supported configuration. This is only a guide. Modify the procedure below to fit your network configuration needs. For example, the VLAN IDs can vary according to your environment.

Explanation of networks

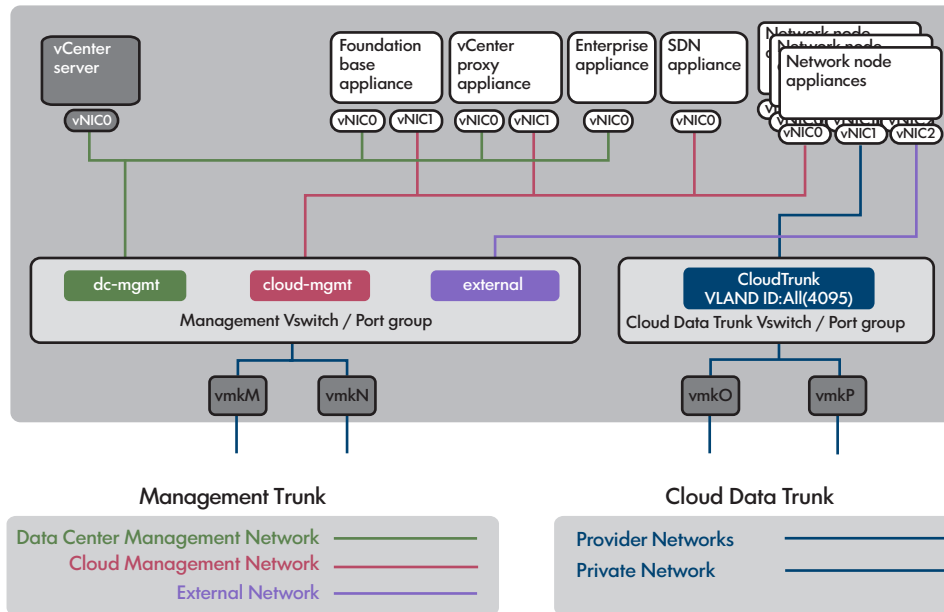
Network	CloudSystem virtual appliance	Management hypervisor vNICs	Example names for vSwitch or port group (matches figure below)
Data Center Management Network	Foundation base appliance vCenter proxy appliance Enterprise appliance vCenter Server ESX compute nodes	vNIC0	dc-mgmt
Cloud Management Network	Foundation base appliance SDN appliance network node appliances vCenter proxy appliance KVM compute nodes	vNIC1 on Foundation base appliance and vCenter proxy appliance vNIC0 on SDN and network node appliances	cloud-mgmt
External Network	network node appliances	vNIC2	external
Cloud Data Trunk	network node appliances all compute nodes	vNIC1	CloudTrunk

❗ **IMPORTANT:** All of the networks described above must be distinct networks, with the exception of the **External Network**. You can use the same network for the External Network and the Data Center Management Network.

For a detailed explanation of the networks, see [Overview of network topology \(page 16\)](#).

The figure below shows a visual representation of the recommended configuration for networks.

Figure 10 ESX sample network configuration



Create the ESX management hypervisor and configure the network infrastructure

The following procedure describes the steps required to create the ESX management hypervisor and configure the network interfaces. The procedure is based on the information provided in the image above, but you can modify the configuration to fit your network needs.

Do not begin the procedures in this section until you read the following important notes about configuring networks.

Table 12 Important network configuration information

Important to know	Why it matters
Do not configure the iSCSI initiators on the management hypervisor.	iSCSI initiators are set up on the compute nodes, not the management hypervisor. Initiators check to see which storage resource on the network are available.
Standard or distributed vSwitch names must be unique to each host in vCenter Server.	vCenter Server requires that all vSwitch names on a host be unique names. (Step 4)
Generic names are used in this procedure. Make sure to substitute the actual names of your interfaces (ifcfg-eth<ID>), bonds (ifcfg-bond<ID>), tagged VLANs (bond<ID>.<VLANID>) and bridges (ifcfg-br-<Name>) when configuring the network.	It is important to use the same names defined in the hardware profile when assigning the networks in the management hypervisor. If the names do not match, then network communication errors will occur. (Step 4) Return to procedure

Prerequisites

- You have administrator privileges to log in to VMware vCenter Server

Procedure 3 Configuring the network infrastructure

- Log in to vCenter Server with the administrator user name and password.

2. Create the management hypervisor (host) in vCenter Server.
See [Important network configuration information \(page 27\)](#).
If you plan to use more than one host to manage the virtual appliances, they must be in a cluster.
3. Select the management host and click the **Configuration** tab, then click the **Networking** link on the left menu.
4. Set up the Management vSwitch or port group IDs according to the configuration that you defined on the server profile and the dedicated network switch. You can also refer to the sample diagram above for guidance on setting port group IDs.
See [Important network configuration information \(page 27\)](#).
5. Set the Cloud Data Trunk port group VLAN.
 - a. To set the port group on a standard vSwitch, set the port group VLAN to 4095 (all VLANs).
 - b. To set the port group on a distributed vSwitch, list the exact range of VLANs assigned to the Cloud Data Trunk.
Example: 1–4, 5, 6, 10–100.
6. Add the following security settings to the Cloud Data Trunk port group.
 - Set Promiscuous mode to **ACCEPT**.
 - Set MAC Address Changes to **ACCEPT**.
 - Set Forged Transmits to **ACCEPT**.
7. Add the following security settings to the External Network port group.
 - Set Promiscuous mode to **ACCEPT**.
 - Set MAC Address Changes to **ACCEPT**.
 - Set Forged Transmits to **ACCEPT**.

Configuring the ESX management environment

The management environment consists of a single management hypervisor host or a cluster of management hypervisor hosts that contain the following virtual appliances.

- A Foundation base appliance
- An SDN appliance
- An optional vCenter proxy appliance

One vCenter proxy appliance is needed for each vCenter that is managing compute nodes in your cloud. If your cloud contains only KVM compute nodes, then you do not need any vCenter proxy appliances.

- Three network node appliances
- An optional Enterprise appliance, if you are using CloudSystem Enterprise

The `csstart` installation script launches a setup assistant to guide you through the installation process. When you run `csstart`, the setup assistant opens and displays fields for capturing details about the new virtual appliance, network configuration, and vCenter Server connections. The information is saved in a configuration file called `deployer.conf`.

Running `csstart` applies the configuration information saved in `deployer.conf` to the virtual appliance designated to host the Foundation base appliance. When the installation completes, the Foundation base appliance appears in the management cluster in vCenter Server.

The SDN appliance and the network node appliances are automatically created after the Cloud Networking settings are entered and saved.

Selecting hypervisor security level for CloudSystem installation

You can select one of three security options when you run the `csstart` setup assistant.

- **Enable full security checks.** When `csstart` runs, it validates certificates to ensure that it is accessing the correct hypervisor. In an ESX environment, `csstart` searches for the stored vCenter Server certificate and matches it to the vCenter Server defined in the installation setup. The stored certificate file must have the hypervisor's certificate along with the complete signing authority chain, unless it is a valid, self-signed certificate. The name of the stored certificate file is specified using the `--os-cacert <filename>` command from the `csstart` CLI. If `csstart` cannot open the file or validate the certificate, then it will fail.

The Foundation base appliance also verifies certificates before starting up each additional virtual appliance.

See [csstart commands \(page 63\)](#).

- **Disable security checks for csstart, but enable security when creating the remaining virtual appliances.** When `csstart` runs, it injects the certificate into the Foundation base appliance, but does not try to verify vCenter Server. When the additional virtual appliances are created by the Foundation base appliance, the certificate is used to verify that the correct hypervisor is used. This is selected by running `--auto-accept-cert` from the command line, or by running the `csstartgui-auto-accept.bat` file to start the installation setup assistant on Windows.

See [csstart commands \(page 63\)](#).

- **Disable security checks.** When `csstart` runs, it does not verify the SSL certificate from the hypervisor. The Foundation base appliance does not perform security checks when starting up the other virtual appliances. This is selected by running `--insecure` from the command line, or by running the `csstartgui-insecure.bat` file to start the installation setup assistant on Windows.

See [csstart commands \(page 63\)](#).

See also

- [Using the csstart CLI to install the Foundation base appliance \(page 64\)](#)
- [Troubleshoot installation issues \(page 52\)](#)

Configuring the Foundation base appliance on ESX

Read the following important notes before configuring the Foundation base appliance.

Table 13 Important CloudSystem configuration information

Important to know	Why it matters
HP recommends that you sync the management hypervisor with a good set of external NTP servers. If CloudSystem is deployed on ESX, configure the Foundation and Enterprise appliances to sync with the same NTP servers configured for the ESX hosts.	Data records can get out of sync between appliances when time is not set to automatically sync with the NTP server. If the Foundation and Enterprise appliance date/time is out of sync, then you will not be able to create designs in HP CSA.
The management hypervisor must be configured with a FQDN (not an IP address).	The FQDN is necessary when attaching block storage volumes using the 3PAR storage system.
You cannot have multiple copies of an appliance image stored in vCenter Server.	<code>csstart</code> looks for appliance image names at random and could select the wrong image. Using different datastores or different folders does not resolve the issue. If you need two copies of an appliance image on a single instance of vCenter, then you must have unique names for each image. Edit the <code>deployer.conf</code> file with a text editor to point to the correct image.

Table 13 Important CloudSystem configuration information *(continued)*

Important to know	Why it matters
The vCenter Server user running <code>csstart</code> only needs the top level privileges for Datastore , Network , Resource , and Virtual machine .	The vCenter Server user that is stored in the base appliance by <code>csstart</code> does not need full administrator privileges on the Windows server running vCenter Server. The user does not need full access to vCenter Server. Allocating the lowest allowed level of privileges optimizes data center security.
The <code>deployer.conf</code> file contains confidential information, such as passwords, and should be kept secure.	When installing with Windows, you should run the <code>csstart</code> setup assistant from a directory with restricted access in order to protect this file. (Step 2)
DRS is recommended for use in a cluster that is also hosting virtual machines other than the CloudSystem management hypervisors.	The automatic placement of CloudSystem management hypervisors in the cluster may overload some hypervisors if DRS is not in use.
If you use a single management host that is not part of a DRS cluster, then make sure you have enough resources to host all CloudSystem virtual appliances.	<code>csstart</code> creates the virtual appliances in the first host of a non-DRS cluster. There is no way to select a specific host. All hosts in the non-DRS cluster need to be large enough to support all CloudSystem virtual appliances.
When you run the <code>csstart</code> setup assistant, you will be asked for a Glance disk size. The installation creates a Glance disk on the same datastore where the base appliance template is stored. See Formula to determine the storage requirements for the management hypervisor (page 12) for sizing calculations.	You must have sufficient space for the virtual appliance boot disks, as well as the Glance disk, or the installation process will not be able to complete. (Step 3) Return to procedure
Each OVA in the datastore needs to have a unique name. You cannot use separate folders in the datastore.	Instances are started in the same datastore that contains the OVA. If multiple OVAs with the same name are stored in the datastore, <code>csstart</code> will not know which one to use to create the instance.
The Enterprise image must be deployed in the same datastore as the other CloudSystem virtual appliance images.	The Enterprise installation will fail if the Enterprise OVA is not included in the same datastore as the other virtual appliance images.
Do not move or delete images, or rename the images, after you create the base appliance.	In order to speed up virtual machine boot times and save disk space, <code>csstart</code> does not make a full copy of the image. Changing the name or location of the image disrupts the operation of the shared copy encoded by <code>csstart</code> .

Prerequisites

- The management hypervisor network infrastructure is in place.
See [Create the ESX management hypervisor and configure the network infrastructure \(page 27\)](#).
- You have administrator privileges to log in to vCenter Server.
- One large datastore is created with approximately 2 TB to support the virtual appliance boot drives plus additional storage for OpenStack Glance images.
See [Formula to determine the storage requirements for the management hypervisor \(page 12\)](#).
- The management hypervisor has connectivity to the HP 3PAR storage system. This is required if you are using block storage for instances.
See [HP 3PAR StoreServ Storage documents \(page 60\)](#).

- The ESX management hypervisor can run as a standalone host. Multiple management hypervisor hosts are configured in a cluster.
- The **csstartgui.bat** and the full **csstart** folder are extracted from **CloudSystem-Tools-8.0.0.20.tar.gz** to a Windows workstation.

Procedure 4 Preparing the CloudSystem virtual machine images

1. Log in to vCenter Server using the VMware vSphere Client or a web browser.
2. Select **Inventory**→**Hosts and Clusters** and select your management cluster.
3. Select **File**→**Deploy OVF template**.
4. Follow the screen prompts. Use the **CS-Base-8.0.0.20.ova** image file that was staged on your Windows workstation. Make sure to name the template **CS-Base-8.0.0.20**. The name should match the ova file name.
 - a. Best practice is to select thin provisioning. Installation is much faster with this option. Thick provisioning requires about an hour for the Foundation base appliance, vCenter proxy appliance and Enterprise appliance to install and it requires 560 GB of space.
 - b. The location where the OVA images are stored is the same location where **csstart** creates the virtual machine appliances. Make sure the datastore you plan to use has 500 GB of space.
5. Verify that the virtual appliance was created. It should be listed on the left side of the screen under the **VMs and templates** view.
Do NOT boot the virtual appliance.
6. Repeat steps 3-6 for the SDN appliance, selecting the **CS-SDN-8.0.0.20.ova** image file that was staged on your Windows workstation. Make sure to name the template **CS-SDN-8.0.0.20**. The name should match the ova file name.
7. Repeat steps 3-6 for the network node appliance, selecting the **CS-NN-8.0.0.20.ova** image file that was staged on your Windows workstation. Make sure to name the template **CS-NN-8.0.0.20**. The name should match the ova file name.
8. Repeat steps 3-6 for the Enterprise appliance, selecting **CS-Enterprise-8.0.0.20.ova** image file that was staged on your Windows workstation. Make sure to name the template **CS-Enterprise-8.0.0.20**. The name should match the ova file name.

Procedure 5 Configuring the Foundation base appliance on ESX

1. Gather the following information, which you will enter later in the `csstart` setup assistant.
See [Important CloudSystem configuration information \(page 29\)](#).
 - Foundation base appliance host name and IP address, if using static IP
 - Glance disk size
 - Foundation base appliance new secure password
 - Data Center Management Network subnet mask
 - Gateway address (jump box on the management network)
 - Preferred DNS server IP address
 - vCenter Server IP address or host name
 - vCenter Server user name and password
 - Management cluster name
 - vCenter Server name for the Data Center Management Network
Refer to **Cluster→Host→Configuration→Networking** in vCenter Server to find the network name.
 - vCenter Server name for the Cloud Management Network
 - vCenter Server name for the Cloud Data Trunk
 - vCenter Server name for the External Network
2. Log on to the Windows server that has network connectivity to the vCenter Server managing the management hypervisor.
See [Important CloudSystem configuration information \(page 29\)](#).
3. Navigate to the **csstart-XXX.bat** file with the preferred security checks and double-click to launch `csstart`.
See [Selecting hypervisor security level for CloudSystem installation \(page 29\)](#).
Opening the `.bat` file launches a browser, opens URL `localhost:5000`, and starts the `csstart` setup assistant.
4. Follow the prompts in the `csstart` setup assistant, using the information you gathered in step one.
See [Important CloudSystem configuration information \(page 29\)](#).
5. When the installation is complete, verify that the Foundation base appliance appears in the management cluster in vCenter Server.
The SDN appliance and network node appliances are created after entering Cloud Network settings in the CloudSystem Console.

See [Troubleshoot installation issues \(page 52\)](#).

Next step: [Setting up the CloudSystem Console for the first time \(page 44\)](#)

6 Installing CloudSystem on a KVM hypervisor

This chapter contains the procedures required to set up the network infrastructure and install the CloudSystem Foundation base appliance on a KVM management hypervisor. The checklist below provides an overview of the installation path.

Table 14 KVM management hypervisor installation path

<input checked="" type="checkbox"/>	Installation step	Related information
	Create the management hypervisor.	Creating the management hypervisor (page 33)
	Configure the network infrastructure.	Configuring the CloudSystem network infrastructure (page 35)
	Choose the type of security checks to perform when running <code>csstart</code> .	Selecting hypervisor security level for CloudSystem installation (page 40)
	Launch <code>csstart</code> and install the Foundation base appliance.	Configuring the Foundation base appliance on KVM (page 41)

Creating the management hypervisor

Use the procedures in this section to create the KVM management hypervisor.

Preparing the hardware

1. If using a blade, edit the server profile.
2. On blades or standalone DLs, perform the following two tasks.
 - a. Define the management networks.
 - b. Define the Cloud Data Trunk and identify the VLANs to include in the trunk.

Installing RHEL

Obtain the installation media from <http://www.redhat.com>. Red Hat distributions and documentation are titled generically as RHEL6, instead of 6.3, 6.4 and so on. Check the documentation revision history or distribution version to be certain you are referencing the correct information.

Prerequisites

- An iLO connection is established.
- The time is set in the BIOS.
- Smart arrays are disabled in the BIOS.
- The iLO virtual media or physical DVD is presented.

Using the RHEL installation media, mount the DVD or ISO image and complete the following steps.

Procedure 6 Installing RHEL on the management hypervisor

1. Test the media.
2. Set the language.
3. Set the keyboard for the language.
4. Configure the installation device types:
 - a. Select **Specialized Storage Devices**.
 - b. Click the **Multipath Devices** tab.
 - c. Select **Boot Volume**.



TIP: Take a screen capture of the boot volume to use as a reference for later configuration.

- d. Acknowledge the storage device warning (typically Yes, discard any data).
5. Set the Fully Qualified Domain Name (FQDN) as the Hostname.
6. Click **Next** and skip configuring the network until later.
7. Select the time zone.
8. Set the root password.
9. Select **Use All Space** and check the option to **Review and modify partitioning layout**.
10. Define logical volumes.

The root directory needs to have enough space to accommodate the appliance images and Glance repository.

See [Formula to determine the storage requirements for the management hypervisor \(page 12\)](#).
11. Write changes to disk.
12. Select the **Minimum** install.
13. Unmount the DVD or ISO image and **reboot**.
14. Update the RHEL installation with the latest security patches from <https://access.redhat.com/security/updates>.
15. Log in to the management host.
16. Configure DHCP_HOSTNAME to allow the management host to register itself with the DNS server:

```
vi /etc/sysconfig/network
DHCP_HOSTNAME=management host name
```
17. Add the DNS server IP address:

```
$ vi /etc/sysconfig/network-scripts/ifcfg-eth0
DNS1=192.0.2.2
```
18. Restart the network service:

```
service network restart
```

Creating a local YUM repository and validating RHEL RPMs

An empty RPM file, **rhel-kvm-deps-8.0.0.20rpm**, is included in the **CloudSystem-Tools-8.0.0.20.tar.gz**. This file lists all the required RHEL RPMs. After creating the YUM repository, run the RPM file and download any missing RPMs. Add the missing RPMs to your local YUM repository.

See [Third-party documents \(page 59\)](#).

Prerequisites

- **rhel-kvm-deps-8.0.0.20rpm** is extracted from the **CloudSystem-Tools-8.0.0.20.tar.gz** file and moved to the Linux workstation.

Procedure 7 Creating a local YUM repository and validating dependencies

For the configuration in this section, use a utility such as WinSCP, which can be downloaded from <http://winscp.org>.

1. Make a new directory and copy RHEL 6.4 to a directory location such as `/home/kits`:

```
# mkdir /home/kits
```
2. Make a new directory for the DVD mount point:

```
# mkdir /dvd
```

3. Mount the DVD:


```
# mount -o loop /home/kits/rhel-server-6.4-x86_64-dvd.iso /dvd
```
4. Create the repository:
 - a.

```
# cd /etc/yum.repos.d/
```
 - b.

```
# vi LocalDCRhel.repo
```

```
[RHELDVD]
```

```
name=Locally Mounted RHEL 6.4 ISO
```

```
baseurl=file:///dvd/
```

```
enabled=0
```
5. Import the GPG-Key (GNU Privacy Guard):
 - a.

```
# rpm --import /etc/pki/rpm-gpg/RPM-GPG-KEY-redhat-release
```
 - b.

```
# yum clean all
```
 - c.

```
# yum update
```
6. Install the RPM file:


```
yum install -y rhel-kvm-deps-8.0.0.xx.rpm --enablerepo=RHELDVD
```

Missing RHEL RPMs are identified and installed.
7. Verify that the **libguestfs** and **libguestfs-tools** packages were installed:


```
yum list | grep libguestfs*
```

Configuring the CloudSystem network infrastructure

Several networks provide the communication platform for HP CloudSystem and the suite of integrated tools. The configuration of the networks is flexible. This section explains the major components of the networking infrastructure and provides an example of a supported configuration. This is only a guide. Modify the procedures below to fit your network configuration needs. For example, the bridge names can vary according to your environment.

Explanation of CloudSystem networks

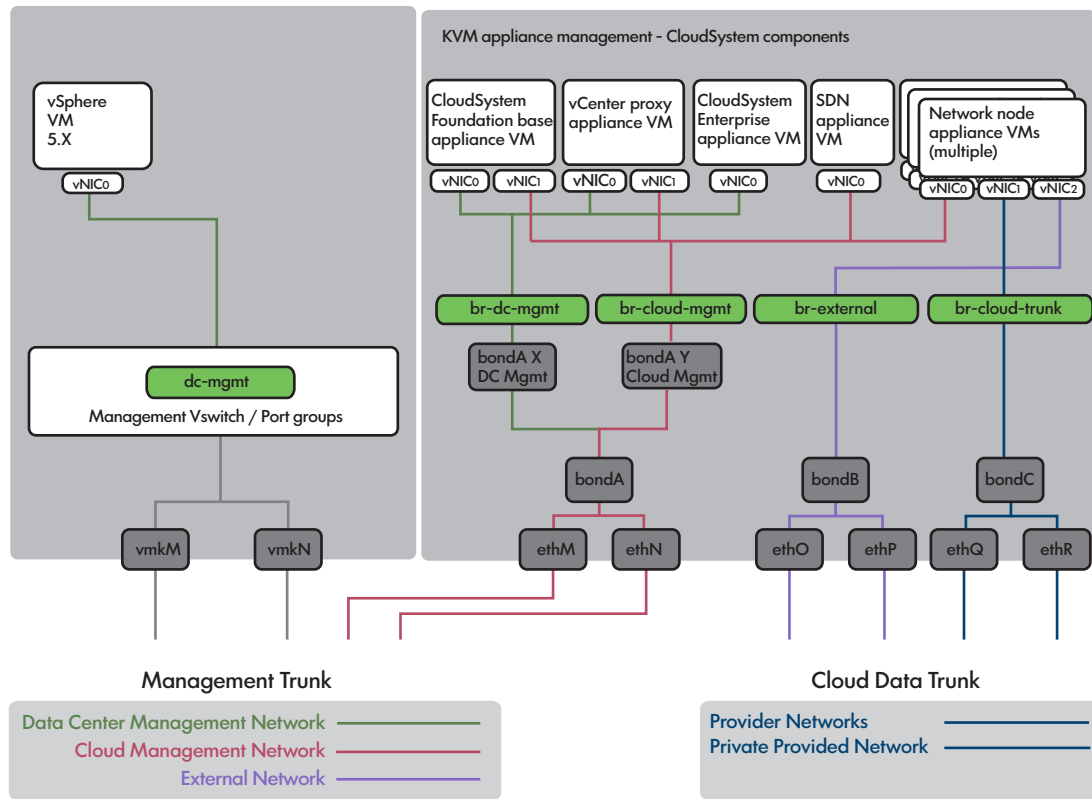
Network	CloudSystem virtual appliance	Management hypervisor interface	Example names for bridges (matches figure below)
Data Center Management Network	Foundation base appliance vCenter proxy appliance Enterprise appliance	vNIC0 vNIC0 vNIC0	br-dc-mgmt
Cloud Management Network	Foundation base appliance vCenter proxy appliance SDN appliance KVM compute nodes	vNIC1 vNIC1 vNIC0 vNIC0	br-cloud-mgmt
Cloud Data Trunk	network node appliances	vNIC1	br-cloud-trunk
External Network	network node appliances	vNIC2	br-external

- ❗ **IMPORTANT:** All of the networks described above must be distinct networks, with the exception of the **External Network**. You can use the same network for the External Network and the Data Center Management Network.

For a detailed explanation of the networks, see [Overview of network topology \(page 16\)](#).

The figure below shows a visual representation of the recommended configuration for networks.

Figure 11 KVM sample network configuration



NOTE: The vCenter proxy appliance shown in the figure is only used if you are managing ESX compute nodes from a KVM management hypervisor.

Configure the network infrastructure on the KVM management hypervisor

The following procedure describes the steps needed to configure the network interfaces on a KVM hypervisor. The procedure is based on the information provided in the image above, but you can modify the configuration to fit your network needs.

Read the following important information before you configure the networks for the Foundation base appliance.

Table 15 Important network configuration information

Important to know	Why it matters
Make sure the VLANs in the Management Trunk are actually assigned to cables plugged into the interface network ports.	A network of cables must be physically connected to allow the supported virtual appliances to communicate over the networks. Make sure the virtual and physical components have correct association such that data can transfer between points (between appliances, hypervisors, servers, nodes, etc.)
Do not configure the iSCSI initiators on the management hypervisor.	iSCSI initiators are set up on the compute nodes, not the management hypervisor. Initiators check to see which storage resource on the network are available.
Generic names, as shown on the sample configuration figure above, are used in this procedure. Make sure to	It is important to use the same names defined in the hardware profile when assigning the networks in the management hypervisor <code>ifconfig</code> files. If the names do not match, then network communication errors will occur.

Table 15 Important network configuration information *(continued)*

Important to know	Why it matters
substitute the actual names of your interfaces (<code>ifcfg-eth<ID></code>), bonds (<code>ifcfg-bond<ID></code>), tagged VLANs (<code>bond<ID>.<VLANID></code>) and bridges (<code>ifcfg-br-<Name></code>) when configuring the network.	(Steps 3-5)
Do not include spaces in bridge name.	<code>csstart</code> does not support spaces in bridge names. (Steps 3-5) Return to procedure

Prerequisites

- Red Hat Enterprise Linux 6.4 is installed on the management host.
- You are using a Linux server as your staging environment.
- The management hypervisor has connectivity to the HP 3PAR storage system. This is required if you are using block storage for instances. See [HP 3PAR StoreServ Storage documents \(page 60\)](#).

Procedure 8 Configuring the network infrastructure

1. Log in to the management hypervisor.
2. Change the directory to `etc/sysconfig/network-scripts`.
3. Create the interface, bond and bridge configuration files for the Data Center Management Network and the Cloud Management Network.

See [KVM sample network configuration \(page 36\)](#).

See [Important network configuration information \(page 36\)](#).

- a. Open the **`ifcfg-ethM`** file and add the following lines:

```
MASTER=bondA
SLAVE=yes
NM_CONTROLLED=no
```

Save the change and close the file.

- b. Open the **`ifcfg-ethN`** file and add the following lines:

```
MASTER=bondA
SLAVE=yes
NM_CONTROLLED=no
```

Save the change and close the file.

- c. Create a new bond configuration file using the name **`ifcfg-bondA`**. This bond connects to `bondA.X` for the Data Center Management Network and `bond A.Y` for the Cloud Management Network. The configuration file should contain the following lines:

```
DEVICE=bondA
BOOTPROTO=none
ONBOOT=yes
NM_CONTROLLED=no
USERCTL=no
BONDING_OPTS="mode=5 miimon=100"
```

Save and close the file.

- d. Create a new bond configuration file using the name **`ifcfg-bondA.X`**. This bond connects to the Data Center Management Network bridge. The configuration file should contain the following lines:

```
DEVICE=bondA.X
BOOTPROTO=none
ONBOOT=yes
NM_CONTROLLED=no
```

```
USERCTL=no
VLAN=yes
BRIDGE=br-dc-mgmt
```

Save and close the file.

- e. Create a new bond configuration file using the name **ifcfg-bondA.Y**. This bond connects to the Cloud Management Network bridge. The configuration file should contain the following lines:

```
DEVICE=bondA.Y
BOOTPROTO=none
ONBOOT=yes
NM_CONTROLLED=no
USERCTL=no
VLAN=yes
BRIDGE=br-cloud-mgmt
```

Save and close the file.

- f. Create a new bridge configuration file using the name **ifcfg-br-dc-mgmt**. This bridge connects the Foundation base appliance, the optional vCenter proxy appliance and the Enterprise appliance to the Data Center Management Network. The configuration file should contain the following lines:

```
DEVICE=br-dc-mgmt
TYPE="Bridge"
DNS1=name_of_the_primary_DNS_server
IPADDR=IP_address_of_the_KVM_management_host
NETMASK=netmask_ID
BOOTPROTO=static
ONBOOT=yes
NM_CONTROLLED=no
DELAY=0
# dc-mgmt, vlan 10
```

Save and close the file.

- g. Create a new bridge configuration file using the name **ifcfg-br-cloud-mgmt**. This bridge connects the Foundation base appliance, the optional vCenter proxy appliance, the SDN appliance and the network node appliances to the Cloud Management Network. The configuration file should contain the following lines:

```
DEVICE=br-cloud-mgmt
TYPE="Bridge"
NM_CONTROLLED=no
BOOTPROTO=none
ONBOOT=yes
DELAY=0
# region mgmt, vlan 12
```

Save and close the file.

4. Create the interface, bond and bridge configuration for the External Network.

See [KVM sample network configuration \(page 36\)](#).

- a. Open the **ifcfg-ethO** file and add the following lines:

```
MASTER=bondB
SLAVE=yes
NM_CONTROLLED=no
```

Save the change and close the file.

- b. Open the **ifcfg-ethP** file and add the following lines:

```
MASTER=bondB
SLAVE=yes
NM_CONTROLLED=no
```

Save the change and close the file.

- c. Create a new bond configuration file using the name **ifcfg-bondB**. This bond connects to the External Network bridge. The configuration file should contain the following lines:

```
DEVICE=bondB
BOOTPROTO=none
ONBOOT=yes
USERCTL=no
NM_CONTROLLED=no
BONDING_OPTS="mode=5 miimon=100"
BRIDGE=br-external
```

Save the change and close the file.

- d. Create a new bridge configuration file using the name **ifcfg-br-external**. This is the bridge that connects the network node appliances to the External Network. The configuration file should contain the following lines:

```
DEVICE=br-external
TYPE="Bridge"
BOOTPROTO=none
ONBOOT=yes
NM_CONTROLLED=no
DELAY=0
```

5. Create the interface, bond and bridge configuration files for the Cloud Data Trunk.

See [KVM sample network configuration \(page 36\)](#).

- a. Open the **ifcfg-ethQ** file and add the following lines:

```
MASTER=bondC
SLAVE=yes
NM_CONTROLLED=no
```

Save the change and close the file.

- b. Open the **ifcfg-ethR** file and add the following lines:

```
MASTER=bondC
SLAVE=yes
NM_CONTROLLED=no
```

Save the change and close the file.

- c. Create a new bond configuration file using the name **ifcfg-bondC**. This bond connects to the Cloud Data Trunk bridge. The configuration file should contain the following lines:

```
DEVICE=bondC
BOOTPROTO=none
ONBOOT=yes
USERCTL=no
NM_CONTROLLED=no
BONDING_OPTS="mode=5 miimon=100"
BRIDGE=br-cloud-trunk
```

Save the change and close the file.

- d. Create a new bridge configuration file using the name **ifcfg-br-cloud-trunk**. This is the bridge that connects the network node appliance to the Cloud Data Trunk. The configuration file should contain the following lines:

```
DEVICE=br-cloud-trunk
TYPE="Bridge"
BOOTPROTO=none
ONBOOT=yes
NM_CONTROLLED=no
DELAY=0
# cloud trunk, vlan all
```

Save the change and close the file.

6. Run the following command to restart networking and allow the new configuration to take effect:
`service network restart`
7. Run the following command to see a list of the bridges that were created and the interfaces for each bridge:
`brctl show`
8. Run the following command to make sure all of the interfaces, bridges and bonds are configured and running:
`ifconfig`
9. Verify that the network is configured correctly by pinging the DNS server or the gateway server for the Foundation base appliance.

Configuring the KVM management environment

The management environment consists of a single management hypervisor host or a cluster of management hypervisor hosts that contain the following virtual appliances.

- A Foundation base appliance
- An SDN appliance
- Three network node appliances
- An optional vCenter proxy appliance for ESX compute nodes
- An optional Enterprise appliance, if you are using CloudSystem Enterprise

The `csstart` installation script launches a setup assistant to guide you through the installation process. When you run `csstart`, the setup assistant opens and displays fields for capturing details about the new virtual appliance and network configuration. The information is saved in a configuration file called `deployer.conf`.

Running `csstart` applies the configuration information saved in `deployer.conf` to the virtual appliance designated to host the Foundation base appliance. When the installation completes, the Foundation base appliance appears in the management hypervisor appliance list.

The SDN appliance and the network node appliances are automatically created after the Cloud Networking settings are entered and saved during [first time setup](#).

Selecting hypervisor security level for CloudSystem installation

You can select one of three security options when you run the `csstart` setup assistant.

- **Enable full security checks.** When `csstart` runs, it requests the SSH key from the hypervisor and then verifies the key against the `ssh/known_hosts` file in the Users directory.
The Foundation base appliance continues to use this certificate to verify that it is communicating with the correct hypervisor before starting up any virtual appliances.
See [csstart commands \(page 63\)](#).
- **Disable security checks for csstart, but enable security when creating the remaining virtual appliances.** When `csstart` runs, it injects the certificate into the Foundation base appliance, but does not perform security checks. When the additional virtual appliances are created by the Foundation base appliance, that certificate is used to verify that the correct hypervisor is used.
See [csstart commands \(page 63\)](#).
- **Disable security checks.** When `csstart` runs, it does not verify the SSL certificate from the hypervisor. The Foundation base appliance does not perform security checks when starting up the other virtual appliances.
See [csstart commands \(page 63\)](#).

See also

- [Using the csstart CLI to install the Foundation base appliance \(page 64\)](#)
- [Troubleshoot installation issues \(page 52\)](#)

Configuring the Foundation base appliance on KVM

Read the following important notes before configuring the Foundation base appliance.

Table 16 Important CloudSystem configuration information

Important to know	Why it matters
HP recommends that you set the time on the management hypervisor to automatically sync with the NTP server. The Foundation and Enterprise appliances should be synced with the virtual machine host running the management hypervisor.	Data records can get out of sync between appliances when time is not set to automatically sync with the NTP server.
If you are using the RHEL default driver, Broadcom TG3 NIC , then you must update the driver. See HP Support Center .	Using an outdated driver will prevent you from accessing a provisioned instance with a floating IP.
If you are using the Emulex driver, be2net , then you must upgrade the driver to version 4.4.245.0 or later. See Citrix support .	Using an outdated driver will interrupt SSH and TCP network traffic.
When installing with Linux, you should run the <code>csstart</code> setup assistant from a directory with restricted access in order to protect this file.	The <code>deployer.conf</code> file contains confidential information, such as passwords, and should be kept secure. (Step 2)
The installation images and the corresponding checksums should be placed in the default <code>/CloudSystem/images</code> directory	The <code>csstart</code> setup assistant does not provide a way to change the image location. You must update that directly in the <code>deployer.conf</code> file. See Using the csstart CLI to install the Foundation base appliance (page 64) .
Exit the <code>csstart</code> setup assistant before using a text editor to change the advanced fields in the deployer.conf file.	The setup assistant caches the contents of the <code>deployer.conf</code> file in memory. If you edit <code>deployer.conf</code> outside of the setup assistant, then the updates are not captured and applied during installation. See Using the csstart CLI to install the Foundation base appliance (page 64) .
When you run the <code>csstart</code> setup assistant, you will be asked for a Glance disk size. Make sure to size the disk appropriately. See Formula to determine the storage requirements for the management hypervisor (page 12) for sizing calculations.	The installation creates a Glance disk on the same datastore where the base appliance template is stored. You must have sufficient space for the virtual appliance boot disks, as well as the Glance disk, or the installation process will not be able to complete. (Step 7)
Do not move, delete or rename images after you create the base appliance.	In order to speed up virtual machine boot times and save disk space, <code>csstart</code> does not make a full copy of the image. Changing the name or location of the image disrupts the operation of the shared copy encoded by <code>csstart</code> . Return to procedure

Prerequisites

- **CloudSystem-Foundation-KVM-8.0.0.20** is downloaded from the release site and images are unpacked on a Linux server.
- A `/CloudSystem` directory is created on the management hypervisor.

- A `/CloudSystem/images` directory is created on the management hypervisor and the `qcow2` images and checksums are moved to this directory. The `/CloudSystem/images` directory should be owned by root and should have permissions set to 755. This setting allows write access only to the root user for the files owned by root.
- 128 GB of memory is available on the management hypervisor for image storage
See [HP CloudSystem installation prerequisites \(page 11\)](#).
- The `csstart` folder and the three `csstart-XXX.bat` files are moved to the management hypervisor.
See [Prepare for the installation \(page 21\)](#).
- The network `ifcfg` files are created in the management hypervisor `etc/sysconfig/network-scripts` directory.
See [Configure the network infrastructure on the KVM management hypervisor \(page 36\)](#).

Procedure 9 Configuring the Foundation base appliance on KVM

1. Gather the following information, which you will enter later in the `csstart` setup assistant.
 - Foundation base appliance host name and IP address, if using static IP
 - Glance disk size
 - Foundation base appliance new secure password
 - Data Center Management subnet mask
 - Gateway address (jump box on the management network)
 - Preferred DNS server IP address
 - Management hypervisor host name, user name and password
 - Name of the Data Center Management Network bridge
 - Name of the Cloud Management Network bridge
 - Name of the Cloud Data Trunk bridge
 - Name of the External Network bridge
2. Log in to the management hypervisor.
See [Important CloudSystem configuration information \(page 41\)](#).
3. Set permissions to run `csstart`:

```
chmod 700 csstart
```
4. Add a hole in the firewall for port 5000 on the Linux system:

```
iptables -I INPUT 3 -p tcp -m state --state NEW -m tcp --dport 5000 -j ACCEPT
```
5. Launch the `csstart-XXX.bat` file with the preferred security checks.
See [Selecting hypervisor security level for CloudSystem installation \(page 40\)](#).
6. Open a supported browser and type `http://IP_address_of_the_KVM_management_host:5000`
7. Follow the prompts in the `csstart` setup assistant, using the information you gathered in step one.
See [Important CloudSystem configuration information \(page 41\)](#).
8. When the installation completes, log in to the management hypervisor and verify that the Foundation base appliance was created:

```
virsh list -all
```


The SDN appliance and network node appliances are created after entering Cloud Network settings in the CloudSystem Console.

See [Troubleshoot installation issues \(page 52\)](#).

Next step: [Setting up the CloudSystem Console for the first time \(page 44\)](#)

7 Setting up the CloudSystem Console for the first time

To complete the final step of the CloudSystem Foundation installation, add Cloud Networking information to the CloudSystem Console. Once the network setting is saved, the Foundation base appliance automatically creates the SDN appliance and network node appliances.

For definitions of the SDN appliance and network node appliances, see [CloudSystem Foundation components \(page 8\)](#).


Configuring cloud networking

- ❗ **IMPORTANT:** Before you apply the Cloud Networking configuration in the CloudSystem Console, verify that you have the correct subnets. Cloud Networking is intended to be configured only once. If you need to change Cloud Networking after compute nodes are activated, you will need to delete all of the compute nodes first.
-

Prerequisites

- Minimum required privileges: Infrastructure administrator
- The appliance is physically connected to the network.
- The Foundation base appliance is installed.

Procedure 10 Configuring cloud networking for the first time

1. Open a supported browser and enter the url `https://<IP address of the Foundation base appliance>`.
2. Log in to the CloudSystem Console using the administrator user name and the new secure password you defined in `csstart`.
The console opens to the Dashboard screen.
3. Expand the help icon  along the right side of the screen.
4. Under the Recommended actions heading, select **Edit Cloud Networking**.
The Cloud Networking window opens.
5. Enter the **Cloud Management subnet** in the field provided. This is the Cloud Management Network you established in [Configuring the CloudSystem network infrastructure \(page 35\)](#) or [Understanding the network infrastructure \(page 26\)](#).
6. Click **OK** to save the settings.
7. Verify that the SDN appliance and network node appliances are created and running:
 - For ESX, check vCenter Server to make sure the appliances are in the cluster.
 - For KVM, log in to the management hypervisor and run the command
`virsh list`

Performing time synchronization on the Foundation base appliance

CloudSystem services can encounter errors and unpredictable system behavior can occur if the time on the Foundation base appliance, vCenter proxy appliance and the Enterprise appliance differ by more than a few minutes. Make sure the correct Time and Language synchronization setting in the CloudSystem Console is selected before CloudSystem is available for general use.

Prerequisites

- Foundation base appliance is successfully installed on a management hypervisor.
- Management hypervisor where the Foundation base appliance was installed is synchronized with a set of NTP servers.

Procedure 11 Synchronizing the Foundation base appliance with the management hypervisor NTP servers

1. Log in to the CloudSystem Console.
2. From the **Settings** screen, click the **Edit** icon in the **Appliance** panel.
 - For ESX:
 1. In the Time and Language settings section, change the setting to **Synchronize with time server**.
 2. Enter the IP address of the external NTP servers.
These servers should be the same NTP servers used by the management hypervisor.
 - For KVM:
 1. In the Time and Language settings section, keep the setting **Synchronize with VM host**.
3. Save the changes.


Next steps: Choose any of the following next steps.

- Refer to the *HP CloudSystem 8.0 Administrator Guide* at [Enterprise Information Library](#) for additional information on configuring ESX and KVM compute nodes, configuring cloud resources and deploying instances.
- [Preparing HP Operations Orchestration for CloudSystem Foundation \(page 47\)](#)
- [Installing CloudSystem Enterprise \(page 49\)](#)

8 CloudSystem Foundation installation next steps

The CloudSystem Foundation installation is complete, but you still need to prepare and build resources for the cloud. The table below provides links to resources that will help you complete these tasks.

Table 17 Cloud preparation steps

	Installation Step	Additional Resources
	Stage and prepare compute nodes.	See the Resource configuration in CloudSystem: Compute node creation chapter in the <i>HP CloudSystem 8.0 Administrator Guide</i> at Enterprise Information Library
	Build and manage cloud resources.	See Cloud service provisioning, deployment and service management in CloudSystem in the <i>HP CloudSystem 8.0 Administrator Guide</i> at Enterprise Information Library

If you are not ready to prepare your cloud, you can go to:

- [Preparing HP Operations Orchestration for CloudSystem Foundation \(page 47\)](#)
- [Installing CloudSystem Enterprise \(page 49\)](#)

9 Preparing HP Operations Orchestration for CloudSystem Foundation

HP Operations Orchestration (OO) is a next generation IT Process Automation solution. OO supports CloudSystem in two ways.

- HP Operations Orchestration Central (OO Central) is integrated with CloudSystem Foundation. It allows you to run workflows to perform administrative tasks in Foundation.
- HP Operations Orchestration Studio (OO Studio) is a separate installation. It allows you to customize workflows, which you can then run in OO Central.

Using OO Central

To access OO Central, open the CloudSystem Console and select **Integrated Tools** from the main menu.

OO Central comes with five general use workflows, which perform administrative tasks for CloudSystem Foundation. You can run these workflows from OO Central.

- **base-cp**: This workflow provides support for integrations with various solutions (email, excel, active directory, file system, etc). It also includes basic operations used by other the content packs.
- **systems-cp**: This workflow provides support for integrating operating systems such as AIX, FreeBSD, HP UX, Red Hat, Solaris, SUSE Linux and Windows.
- **virtualization-cp**: This workflow supports integration with virtualization platforms such as Citrix Xen Server, Hyper-V, KVM, SCVMM and VMware.
- **hp-solutions-cp**: This workflow provides support for integrating HP solutions such as HP ArchSight, HP Fortify, HP Load Runner, HP Application Lifecycle Management, and HP Onboard Administrator.
- **cloud-cp**: This workflow supports exposed APIs from cloud providers like OpenStack, Amazon EC2, IAM, S3 and VMware vCloud.

Once the workflows are loaded, you can run them at any time. For more information about HP Operations Orchestration, see <http://www.hp.com/go/oo>.

Installing OO Studio

There are two parts to the OO Studio installation.

- [Installing OO Studio \(page 47\)](#)
- [Upgrading OO Studio \(page 48\)](#)

Installing OO Studio allows you to customize workflows. Customized flows are saved as content packs and exported to a local directory. You can then pull the customized flows into OO Central and run them to perform administrative tasks in CloudSystem Foundation.

Prerequisites

- Foundation is fully installed and first time setup is completed.
- You have access to a Windows workstation.
- System requirements are met. Refer to *HP Operations Orchestration System Requirements at Enterprise Information Library*.

Procedure 12 Installing OO Studio

1. Unzip the **HP CloudSystem OO Studio 8.0 Mar 2014** .zip file (Z7550-01319.zip).
2. Untar the zip file.

3. Launch the `OO-installer.exe` file.
 - a. Take all default settings when moving through the installation setup, until the Content packs screen.
 - b. Do not import content packs at this time. Skip to the next screen.
 - c. Click **Next** and finish the installation.
4. Complete the OO Studio upgrade procedure. Upgrading to OO Studio 10.02 is required.

Procedure 13 Upgrading OO Studio

1. From the unzipped HP CloudSystem OO Studio 8.0 Mar 2014 .zip file, find `oo-studio-upgrade.zip`.
2. Unzip the `oo-studio-upgrade.zip` file into the `C:/Program Files/Hewlett-Packard/HP Operations Orchestration` folder.
A new folder named **upgrade** is created.

-
- ① **IMPORTANT:** Make sure to extract the zip file directly in the main installation folder, and not a sub-folder. The **apply-upgrade.bat** script will only work if the upgrade folder is directly under the main installation folder.
-
3. Open a Windows command line and perform the following directory changes:


```
cd/ HP Operations Orchestration
cd/ upgrade
cd 10.02
cd bin
```
 4. Make sure OO Studio is closed. You should not execute the following command with the program open.
 5. Run the command


```
apply-upgrade.bat
```
 6. Type `Y` to apply the upgrade.
 7. Wait for the UPGRADE SUCCESS message to verify that the upgrade completed without errors. This can take several minutes.
 8. **Optional:** If you want to edit the content packs included in OO Central, import the content packs using the following steps:
 - Open OO Studio.
 - Under Dependencies, click **Import Content Pack**.
 - Select all the jar files extracted from the `OOContentPacks.zip` and click **Open**.
 - Verify that the content packs display in the Dependencies section.

Next steps

- Refer to the OO Studio documentation bundled with the OO Studio program files for additional information on using workflows.
- Refer to the *HP CloudSystem 8.0 Administrator Guide* at [Enterprise Information Library](#) for additional information.

10 Installing CloudSystem Enterprise

CloudSystem Enterprise is an IaaS, PaaS and SaaS solution used for complex cloud provisioning. Administrators create infrastructure templates and provide them as service offerings in the Marketplace Portal. Enterprise includes designer software, the Marketplace Portal, and full HP CSA functionality. See [Explanation of solution components \(page 6\)](#) for a detailed description of components.

- ❗ **IMPORTANT:** Do not change the Foundation base appliance network configuration (host name, IP address, subnet mask, gateway address, DNS server or alternate DNS server) *after* Enterprise is installed. Doing so will break communication between Foundation and Enterprise and you will not be able to create subscriptions, create or edit designs or manage existing subscriptions in HP CSA.

Installing the Enterprise appliance

Use the CloudSystem Console to launch the Enterprise installation. When you install Enterprise, a new virtual appliance is created on the management hypervisor. The entire installation process should take about 20 minutes.

Table 18 Important CloudSystem configuration information

Important to know	Why it matters
The management hypervisors hosting the Foundation appliance and Enterprise appliance must use the same NTP servers for time sync.	When the two appliances are out of sync, then you will not be able to create designs using HP CSA.
Enterprise and Foundation must use the same IP address conventions.	If Foundation was configured to support DHCP address assignments, this configuration will apply automatically to Enterprise. If Foundation was configured to support static IP addresses, you must enter an IP address for the new Enterprise virtual appliance.
If you want to enable strong OpenLDAP or Active Directory certificate validation for authentication to the CloudSystem Portal, review the steps in the “Enabling strong certificate validation in the CloudSystem Portal” appendix of the <i>HP CloudSystem 8.0 Administrator Guide</i> before you install Enterprise.	Strong certificate validation may require a change to the alternate DNS server on the Foundation base appliance. Any changes to the Foundation base appliance network configuration must be made before Enterprise is installed, because Enterprise uses these settings to communicate with Foundation.

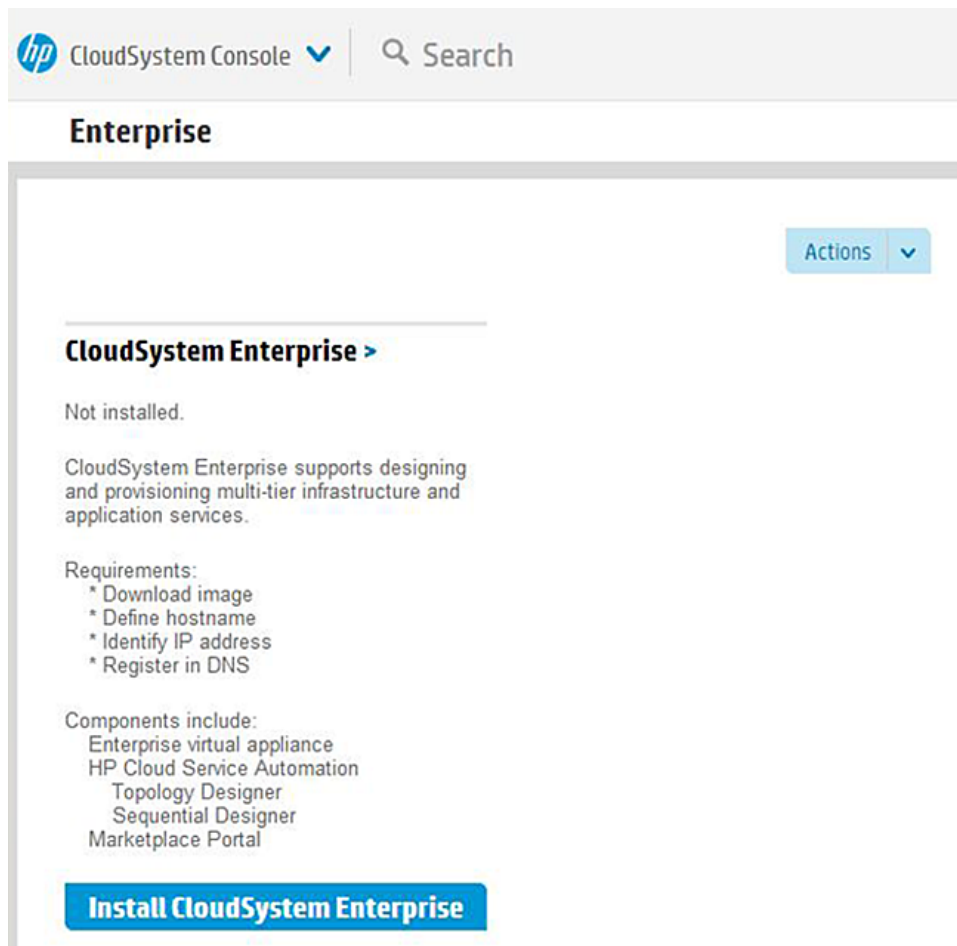
Prerequisites

- Foundation is fully installed and [first time setup](#) is complete.
- In an ESX configuration, the Enterprise OVA is added to the datastore that supports the management cluster in vCenter Server.
- In a KVM configuration, the Enterprise qcow2 image is saved to the Linux or Windows server where you ran `csstart` to install the Foundation base appliance.
- You are using a supported Chrome browser. See [HP CloudSystem installation prerequisites \(page 11\)](#).
- You have selected an IP address, if using static IPs, and registered the FQDN for the Enterprise appliance with the DNS server.

Procedure 14 Installing CloudSystem Enterprise

1. Log in to the CloudSystem Console.
 2. Select **Enterprise** from the main menu.
 3. Click the **Install CloudSystem Enterprise** button.
- The installation window opens.

Figure 12 Enterprise screen in CloudSystem Foundation



4. Review the installation instructions, then click **Next**.
5. In the Enterprise appliance host name field, enter the FQDN that you registered with the DNS server.
6. Enter the static IP address for the new Enterprise appliance.

NOTE: If the Data Center Management Network configured in Foundation uses DHCP, skip this step.

7. Click **Next**.
8. Enter the user name and password required to log in to OO Central.
OO Central runs on the Foundation base appliance. The user name and password are the same as the user name and password used to access the CloudSystem Console, except that you must enter the OO user name with all lower case letters. Once you log in to OO Central for the first time, you can change the user name and password.
9. Click **Install**.
10. Verify that the appliance was created successfully.
After Enterprise is installed, a **Tools** and **Configuration** pane are added to the Enterprise screen. The Tools pane displays links to the Cloud Service Management Console and the Marketplace Portal.

All existing Foundation functionality will continue to be available. Enterprise appliance details can be monitored in the CloudSystem Console from the **Enterprise** screen. Perform all management tasks for the Enterprise appliance in the CloudSystem Console on the **Settings** screen.

Procedure 15 Configure Enterprise to use the Foundation NTP servers for time sync

If you are using an ESX management hypervisor to manage the Enterprise appliance, then you will need to perform the following procedure.

1. Enable the console user for the Enterprise appliance.
See appendix C, "Supported console operations on the CloudSystem Foundation appliance" in the *HP CloudSystem 8.0 Administrator Guide* at the [Enterprise Information Library](#).
2. Log in as `cloudadmin` through the Enterprise console. You can use `CTRL+ALT+F1` to switch to the console log in prompt.
3. Edit the NTP configuration file to add the server entries:

```
sudo vi/etc/ntp.conf
```
4. Restart the NTP service:

```
sudo service ntpd restart
```
5. Restart the Enterprise appliance.

See also: Refer to the *HP CloudSystem 8.0 Administrator Guide* at the [Enterprise Information Library](#) for additional information on using HP CSA to create designs.

Next steps: See "Understanding CloudSystem Enterprise" in the *HP CloudSystem 8.0 Administrator Guide* at [Enterprise Information Library](#).

11 Troubleshoot installation issues

- [csstart errors \(page 53\)](#)
- [OO Studio installation errors \(page 55\)](#)
- [Enterprise upgrade errors \(page 55\)](#)

NOTE: For additional troubleshooting information, see the **Troubleshooting** chapters in the *HP CloudSystem 8.0 Administrator Guide*, available at [Enterprise Information Library](#).

Basic troubleshooting techniques

HP CloudSystem has a variety of troubleshooting tools you can use to resolve issues. By following a combined approach of examining screens and logs, you can obtain a history of activity and the errors encountered.

- The **Activity** screen in the CloudSystem Console displays a log of all changes made on the appliance, whether user-initiated or appliance-initiated. It is similar to an audit log, but with finer detail and it is easier to access from the UI.
The **Activity** screen also provides a log of health alerts and status notifications.
- You can download an audit log in the CloudSystem Console to help you understand what security relevant actions took place on the system.
- You can create a support dump file in the CloudSystem Console to gather logs and other information required for debugging into an encrypted, compressed file that you can send to your authorized support representative for analysis.

Recommendation	Details
Look for a message	<p>About syntax errors:</p> <ul style="list-style-type: none">• The user interface checks for syntax when you enter a value. If you make a syntax error, an instructional message appears next to the entry. The user interface or command line continues to display messages until you enter the correct value. <p>About network setup errors:</p> <ul style="list-style-type: none">• Before applying them, the appliance verifies key network parameters like the IP address and the fully qualified domain name (FQDN), to ensure that they have the proper format.• After network settings are applied, the appliance performs additional validation, such as reachability checks and host name to IP lookup. If a parameter is incorrect, the appliance generates an alert that describes validation errors for the Network Interface Card (NIC), and the connection between the browser and the appliance can be lost.
Examine the Activity screen	<p>To find a message for an activity:</p> <ol style="list-style-type: none">1. Locate recent activities with a severity of Critical, Warning, or Unknown.2. Read the message for problem identification and potential solutions.3. Expand the activity to add notes to the activity details.
Examine the appliance virtual machine	<p>When VM host is down or nonresponsive:</p> <ol style="list-style-type: none">1. From the local computer, use the <code>ping</code> command to determine if you can reach the appliance.<ul style="list-style-type: none">• If the <code>ping</code> command is successful, determine that the browser settings, especially the proxy server, are correct. Consider bypassing the proxy server.• If the <code>ping</code> command did not reach the appliance, ensure that the appliance is connected to the network.2. Log onto hypervisor to verify that the hypervisor is running.

Recommendation	Details
	<ol style="list-style-type: none"> Verify that the virtual guest for the appliance is operational. Ensure that the VM host configuration is valid. Verify the accuracy of the IP address and other network parameters for the VM host. From the management console, ensure that the appliance network settings are accurate. Examine the hypervisor performance data. If the appliance is running at 100% utilization, restart the hypervisor.
Enable console access	<p>About console access:</p> <ul style="list-style-type: none"> Use the following <code>csadmin console-users</code> CLI commands to enable console access and set the password. After running the command, you can locate logs for additional troubleshooting information. The <code>VM_name</code> is the virtual machine where you want to execute the command. The <code>csadmin console-users</code> commands are supported on the Foundation base appliance, the Enterprise appliance, and the Proxy appliances. <p>To enable console access:</p> <ol style="list-style-type: none"> Open the CLI. Enter the command: <code>csadmin console-users enable --vm-name VM_name</code> <p>To set the password console access:</p> <ul style="list-style-type: none"> Open the CLI. Enter the command: <code>csadmin console-users set-password --password CAPasswd --vm-name VM_name</code> <p>Where <code>CAPasswd</code> is the password for the Cloud Administrator.</p> <p>For more information on the use of CLI, see <i>HP CloudSystem 8.0 Administrator Guide at Enterprise Information Library</i>.</p>

csstart errors

The log file is the best resource for identifying the type of error that occurred. Check the log file first to narrow down error possibilities. You can also review the problems and recommendations listed below.

Table 19 ESX troubleshooting tips

Symptom	Possible cause and recommendation
You see the error Installation failed. Please correct the error and try again.	<p>The csstart web UI does not run correctly on a Japanese Windows system</p> <ul style="list-style-type: none"> Before running <code>csstart</code>, set the environment variable <code>PYTHONIOENCODING=UTF-8</code> in the steps below. <ul style="list-style-type: none"> If you are running <code>csstart</code> using one of the <code>csstartgui-*.bat</code> files, set this variable in the <code>csstartgui-*.bat</code> file that you are using. If you are running <code>csstart</code> from a command prompt window, set this variable in the <code>csstartgui-*.bat</code> file before running the <code>csstart gui --start-browser ...</code> command.

Table 19 ESX troubleshooting tips *(continued)*

Symptom	Possible cause and recommendation
	<ol style="list-style-type: none"> 1. Edit <code>csstartgui-*.bat</code>. 2. Add <code>set PYTHONIOENCODING=UTF-8</code> as the first line of the file, and save the file. 3. Double-click the file. <ul style="list-style-type: none"> • Run the Linux version of <code>csstart</code>. When you install CloudSystem on a KVM host, you can run <code>csstart</code> on the hypervisor. • Set English or Chinese as the preferred language in the web browser.
<p><code>csstart</code> fails to install CloudSystem on vCenter Server and you see the error message</p> <pre>[Intlmp1-ESX] cloneFromTemplate, com.vmware.vim25.No Permission</pre>	<p>User does not have proper privileges in vCenter Server to create virtual machines</p> <ol style="list-style-type: none"> 1. Log in to vCenter Server. 2. Add the privilege for clone operations to the role that is running <code>csstart</code>. This operation allows users to allocate space in the datastore, create virtual machines, power up and down virtual machines and delete virtual machines on the management cluster. 3. From the Host and Cluster view, select the management cluster. 4. Right-click the management cluster and select Add Permissions. The Assign Permissions window opens. 5. In the left pane, select the role that is running <code>csstart</code>. This is the role that receives the new permission. 6. In the right pane, scroll down to Virtual machine and expand Provisioning. 7. Select the clone virtual machine permission. 8. Click OK to save the new permission for the role.
<p>Security check fails when running <code>csstart</code> and you see the message</p> <pre>Warning: Different certificates are being used for SSL and Solution users. Manual intervention is required.</pre> <p>Security checks fail when running <code>csstart</code> and you see the message</p> <pre>Using certificate file: No File Found Error: Failed to validate your vCenter using ssl.</pre>	<p>Certificate files do not match</p> <ol style="list-style-type: none"> 1. Press CTRL-C to interrupt <code>csstart</code>. 2. Query the hypervisor where vCenter Server is installed: <code># keytool -printcert -rfc -sslserver servername[:port]</code> 3. Copy everything from <code>-----BEGIN CERTIFICATE-----</code> to <code>-----END CERTIFICATE-----</code> into a new file. 4. Add a name to the file: <code>--os-cert option <filename></code> 5. Move the file to the same directory where <code>csstart</code> is located. 6. Retry the procedure Configuring the Foundation base appliance on ESX (page 32).
<p>Security checks fail because the SSL certificate expired or is invalid due to a hypervisor host name change</p>	<p>Certificate file is missing</p> <ol style="list-style-type: none"> 1. Use the Add CA Cert option in the vCenter Server Registration screen to add the new SSL certificate. 2. Retry the procedure Configuring the Foundation base appliance on ESX (page 32).
<p>You see the message</p> <pre>Certificates do not conform to algorithm constraints</pre>	<p>An upgraded version of vCenter Server has a server certificate with a 512 bit key length</p> <ol style="list-style-type: none"> 1. Generate a new certificate for vCenter Server. 2. Retry the procedure Configuring the Foundation base appliance on ESX (page 32).

Table 19 ESX troubleshooting tips *(continued)*

Symptom	Possible cause and recommendation
	<p>Modify the java.security file to accept RSA keys shorter than 1024 bits</p> <ol style="list-style-type: none"> 1. Log on to the Foundation base appliance. 2. Open /usr/lib/jvm/jre-1.7.0-openjdk.x86_64/lib/security/java.security 3. Comment out the following line: jdk.certpath.disabledAlgorithms=MD2, RSA keySize < 1024 <p>IMPORTANT: Make sure that you understand the security implications of using shorter keys before you modify the java.security file.</p>

Table 20 KVM troubleshooting tips

Symptom	Possible cause and recommendation
RHEL default drivers are not able to manage VLANs	<p>Broadcom TG3 NIC driver needs to be upgraded</p> <ol style="list-style-type: none"> 1. Find the driver and firmware here: HP Support Center. 2. Install the upgrade and retry the procedure Configuring the Foundation base appliance on ESX (page 32).
Security checks fail when running csstart and you see the message Using certificate file: No File Found Error: Failed to validate your vCenter using ssl.	<p>Users directory does not contain an SSH key</p> <ol style="list-style-type: none"> 1. Log on to Foundation base appliance. 2. Edit the known_hosts file with the SSH key value. 3. Run csstart again.

OO Studio installation errors

Symptom	Possible cause and recommendation
Anti-virus software prevents OO Studio install and displays the message vbasic error	<p>OO Studio version needs an upgrade</p> <ol style="list-style-type: none"> 1. Apply the OO Studio upgrade using the Upgrading OO Studio (page 48) procedure.

Enterprise upgrade errors

The table below contains errors that can occur during an Enterprise upgrade or when using the HP CSA management console.

Support dump details: You can create a support dump from the csadmin CLI, if you have it installed on your Windows or Linux server. It is included in the CloudSystem-Tools-8.0.0.20.tar. Once csadmin is installed, there are two relevant commands:

- \$csadmin appliance list: lists the names of the available management virtual machines. This lets you find the appropriate appliance name.
- \$csadmin appliance supportdump -av <appliance_name>: creates a dump of all relevant logs and stores it on the management hypervisor. The support dump is saved to your staging server.

Table 21 Enterprise troubleshooting tips

Symptom	Possible cause and recommendation
The Enterprise installation progress indicator is not visible	<p>The console session was terminated</p> <ol style="list-style-type: none"> While the installation is in progress, keep your console session active. <ul style="list-style-type: none"> Do not refresh the Enterprise screen. Do not log off the CloudSystem Console. <p>NOTE: While the installation is in progress, you can navigate to other console screens and see the progress indicator when you return to the Enterprise screen.</p>
You see the message CloudSystem Enterprise installation failed	<p>CloudSystem-Enterprise-8.0.020 was not added to the ESX cluster or KVM management hypervisor</p> <ol style="list-style-type: none"> For ESX: <ul style="list-style-type: none"> Log in to vCenter Server and make sure the CS-Enterprise-8.0.0.20 OVA is saved to the datastore supporting the management cluster. The image name must be CS-Enterprise-8.0.0.20. For KVM: <ul style="list-style-type: none"> Log in to the management hypervisor and make sure the CloudSystem-Enterprise-8.0.0.20 image is saved in /CloudSystem/images.
You see the message CloudSystem Enterprise installation succeeded, but could not start up due to a communication problem	<p>Enterprise appliance is not done booting</p> <ol style="list-style-type: none"> Wait a few minutes. The Enterprise appliance is not ready. Retry the login action.
When logging in to HP CSA for the first time you see the message Default organization not found	<p>Enterprise appliance is not ready</p> <ol style="list-style-type: none"> Wait a few minutes. The Enterprise appliance is not ready and is still trying to bring up the HP CSA appliance or is still recovering from a reboot. Retry the login action.

12 Support and other resources

- ❗ **IMPORTANT:** This product contains a technical feature that will allow an on-site authorized support representative to access your system, through the system console, to assess problems that you have reported. This access will be controlled by a password generated by HP that will only be provided to the authorized support representative. You can disable access at any time while the system is running.

HP technical support personnel are not granted remote access to the appliance.

- [Information to collect before contacting HP \(page 57\)](#)
- [How to contact HP \(page 57\)](#)
- [Registering for software technical support and update service \(page 57\)](#)
- [HP authorized resellers \(page 58\)](#)
- [Documentation feedback \(page 58\)](#)
- [Related information \(page 58\)](#)

Information to collect before contacting HP

Be sure to have the following information available before you contact HP:

- Software product name
- Hardware product model number
- Operating system type and version
- Applicable error message
- Third-party hardware or software
- Technical support registration number (if applicable)

How to contact HP

Use the following methods to contact HP:

- To obtain HP contact information for any country, see the Contact HP worldwide website:
<http://www.hp.com/go/assistance>
- Use the **Get help from HP** link on the HP Support Center:
<http://www.hp.com/go/hpsc>
- To contact HP by telephone in the United States, use the Contact HP – Phone Assist website to determine the telephone number that precisely fits your needs. For continuous quality improvement, conversations might be recorded or monitored.
<http://www8.hp.com/us/en/contact-hp/phone-assist.html#section1>

Registering for software technical support and update service

HP CloudSystem includes one year of 24 x 7 HP Software Technical Support and Update Service. This service provides access to HP technical resources for assistance in resolving software implementation or operations problems.

The service also provides access to software updates and reference manuals, either in electronic form or on physical media as they are made available from HP. Customers who purchase an electronic license are eligible for electronic updates only.

With this service, HP CloudSystem customers benefit from expedited problem resolution as well as proactive notification and delivery of software updates. For more information about this service, see the following website:

<http://www.hp.com/services/insight>

Registration for this service takes place following online redemption of the license certificate.

HP authorized resellers

For the name of the nearest HP authorized reseller, see the following sources:

- In the United States, see the U.S. HP partner and store locator website:
http://www.hp.com/service_locator
- In other locations, see the Contact HP worldwide website:
<http://www.hp.com/go/assistance>

Documentation feedback

HP is committed to providing documentation that meets your needs.

To help us improve the documentation, send your suggestions and comments to:

docsfeedback@hp.com

In your mail message, include the following information. They are located on the front cover.

- Document title
- Published date
- Edition number

Help us pinpoint your concern by posting the document title in the Subject line of your mail message.

Related information

- [HP CloudSystem documents \(page 58\)](#)
- [HP Software documents \(page 59\)](#)
- [HP Insight Management documents \(page 59\)](#)
- [Third-party documents \(page 59\)](#)
- [HP 3PAR StoreServ Storage documents \(page 60\)](#)
- [HP ProLiant servers documents \(page 61\)](#)

Use this section to learn about available documentation for HP CloudSystem components and related products.

HP CloudSystem documents

The latest versions of HP CloudSystem manuals and white papers can be downloaded from the *Enterprise Information Library* at <http://www.hp.com/go/CloudSystem/docs>, including the following documents:

- *HP CloudSystem 8.0 Release Notes*
- *HP CloudSystem 8.0 Installation and Configuration Guide*
- *HP CloudSystem 8.0 Administrator Guide*
- *HP CloudSystem Help*
- *HP CSA Concepts Guide*
- *HP CSA Release Notes*

- *HP CSA API Quick Start Guide*
- *HP CSA Troubleshooting*
- *HP CSA API Reference*
- *HP CSA Documentation List*
- *HP Operations Orchestration Concepts*
- *HP Operations Orchestration Central User Guide*
- *HP Operations Orchestration Application Program Interface (API) Guide*

Online help for the CloudSystem Console is available by clicking the help control button: 

The help control button expands the help sidebar. Links in the sidebar open UI screens for **Recommended Tasks**, help for the current screen (**Help on this page**), and help for all tasks and procedures (**Browse help**).

HP Software documents

The latest versions of HP Software product manuals and white papers can be downloaded from the *HP Software Product Manuals* web site at <http://support.openview.hp.com/selfsolve/manuals>.

Finding documents on the HP Software Product Manuals web site

Follow these instructions to access all technical manuals for **HP Cloud Service Automation** and **HP Operations Orchestration**.

1. Go to the *HP Software Product Manuals* web site (<http://support.openview.hp.com/selfsolve/manuals>).
2. Log in with your HP Passport user name and password.
OR
If you do not have an HP Passport, click **New users — please register** to create an HP Passport, then return to this page and log in.
3. In the **Product** list box, scroll down and select a product name.
4. In the **Product Version** list, select the version of the manuals that you are interested in.
5. In the **Operating System** list, select the relevant operating system.
6. Click the **Search** button to see a list of linked titles.

HP Insight Management documents

The latest versions of HP Matrix Operating Environment manuals, white papers, and the *HP Insight Management Support Matrix* can be downloaded from the *HP Enterprise Information Library* at <http://www.hp.com/go/matrixoe/docs>, including the following documents:

- *HP Matrix Operating Environment Release Notes*
- *HP Insight Management Support Matrix*
- *HP Matrix Operating Environment Infrastructure Orchestration User Guide*
- *Cloud bursting with HP CloudSystem Matrix infrastructure orchestration*

Third-party documents

CloudSystem incorporates OpenStack technology (listed below), and interoperates with other third-party virtualization software.

OpenStack Havana

- [OpenStack Documentation for Havana releases](#)
 - *Cloud Administrator Guide*
 - *Virtual Machine Image Guide*
 - *API Quick Start*
 - *Admin User Guide*
 - *End User Guide*
 - Command reference
 - Keystone commands
 - Glance commands
 - Neutron commands
 - Nova commands
 - Cinder commands

Red Hat

- [Red Hat Enterprise Linux 6 documents](#)

VMware

- [VMware vSphere documents](#)

HP 3PAR StoreServ Storage documents

The latest versions of HP 3PAR StoreServ Storage manuals can be downloaded from the *HP Support Center*, including the following documents:

- *HP 3PAR StoreServ Storage Concepts Guide*
- *HP 3PAR StoreServ Storage Troubleshooting Guide*

Finding documents on the HP Support Center web site

Follow these instructions to access all technical manuals hosted on the HP Support Center.

1. Go to the *HP Support Center* web site (<http://www.hp.com/go/support>).
2. Select the **Drivers & Software** tab.
3. Type a product name in the **Find by product** box and click **Go**.
4. Select a specific product from the resulting list.
5. On the specific product support page, locate the search fields at the top right of the web page. The top search field will contain the product name that you selected earlier in your search.
6. In the second search field below the first, type “manuals” and press **Enter**.
If the list of documents is long, it might take a few seconds to load the page with the search results.
7. You can refine the search results using the sorting options in the document table headers or by further refining your search criteria in the search feature that is located immediately above the document list.

HP ProLiant servers documents

- The *HP Integrated Lights-Out QuickSpecs* contain support information and are available from the iLO product website:
<http://www.hp.com/go/ilo>
- HP ProLiant servers:
 - ProLiant BL BladeSystem servers:
<http://www.hp.com/go/blades>
 - ProLiant DL series rack mount servers:
<http://www.hp.com/servers/dl>
 - ProLiant ML series tower servers:
<http://www.hp.com/servers/ml>
 - ProLiant SL series scalable system servers:
<http://h10010.www1.hp.com/wwpc/us/en/sm/WF02a/15351-15351-3896136.html>

A Command line interfaces

Four command line interfaces (CLIs) are packaged in the CloudSystem release download.

- **csstart.exe**: provides command line access to run CloudSystem installation commands.
- **csadmin.exe**: provides command line access to run CloudSystem administrative commands.
- **CS-client-CLI-8.0.0.2.msi**: provides the ability to run CloudSystem and OpenStack command lines from a Windows command prompt.
- **CS-client-CLI-8.0.0.2.rpm**: provides the ability to run CloudSystem and OpenStack command lines from a Linux system.

Preparing to use CLIs

The CLIs are packaged in the **CloudSystem-Tools-8.0.0.20** release tar. The `csstart` and `csadmin` CLIs do not require additional installation steps.

The OpenStack CLIs must be installed on either a Windows or Linux workstation.

Installing OpenStack CLIs on Windows

Prerequisite

- If using an ESX management hypervisor, the `CS-client-CLI-8.0.0.2.rpm` file is in the cluster datastore.
- If using a KVM management hypervisor, the `CS-client-CLI-8.0.0.2.msi` is in the **/CloudSystem** directory.

Procedure 16 Installing the OpenStack CLI on a Windows workstation

1. From a Windows workstation, double-click the MSI file to execute it and launch the Windows installer.
2. Follow the Windows installer screen instructions to complete the installation.
The executable is installed in `c:\Program Files\Hewlett-Packard\RemoteCli`.
3. Open the Windows command prompt and execute the CLI.

See also

- For a list of unsupported OpenStack Havana CLI commands, see the *Limitations on support for OpenStack CLI commands* appendix in the *HP CloudSystem 8.0 Administrator Guide at Enterprise Information Library*.
- For a list of all OpenStack Havana CLI commands, see [OpenStack Documentation for Havana releases](#).

Installing OpenStack CLIs on Linux

Prerequisite

- If using an ESX management hypervisor, the `CS-client-CLI-8.0.0.2.rpm` file is in the cluster datastore.
- If using a KVM management hypervisor, the `CS-client-CLI-8.0.0.2.msi` is in the **/CloudSystem** directory.

Procedure 17 Installing the OpenStack CLI on a Linux workstation

1. From a Linux workstation run:

```
yum install CS-client-CLI-8.0.0.2.rpm
```


The executable is installed under `/usr/bin`.
2. Open an SSH client and execute the CLI.

See also

- For a list of unsupported OpenStack Havana CLI commands, see the *Limitations on support for OpenStack CLI commands* appendix in the *HP CloudSystem 8.0 Administrator Guide* at [Enterprise Information Library](#).
- For a list of all OpenStack Havana CLI commands, see [OpenStack Documentation for Havana releases](#).

Using CLI commands

csstart commands

Table 22 csstart commands

Task	CLI command	Example	What it does
View the EULA before accepting it	save-eula	csstart save-eula	This command saves a copy of the EULA to your local directory. Search for eula.html . You can open the file and read the EULA before accepting it.
Create a sample configuration file	create-config [--config]	csstart create-config	This command creates the configuration file. The default name is deployer.conf . The [--config] flag allows you to create a unique name for the file, if you don't want to use the default name.
Secure start of csstart	start [--config] --os-cacert<filename> --eula accepted	csstart start --eula accepted	Starts the Foundation base appliance virtual machine and checks the vCenter certificate (ESX) or SSH key (KVM) before creating the base appliance. Certificates and keys are also checked before starting the other virtual appliances. The [--config] flag allows you to specify a configuration file, if you didn't use the default deployer.conf name. The --os-cacert<filename> flag identifies the file used to verify the certificate or key. The EULA is automatically accepted. See Installing CloudSystem on an ESX cluster (page 26) for instructions on pointing to the certificate. See Installing CloudSystem on a KVM hypervisor (page 33) for instructions on pointing to the SSH key.
Semi-secure start of csstart	start [--config] --auto-accept-cert --eula accepted	csstart start --auto-accept-cert --eula accepted	Automatically accepts the vCenter Server certificate (ESX) or SSH key (KVM) and uses it to verify additional virtual appliances started by the Foundation base appliance.

Table 22 csstart commands *(continued)*

Task	CLI command	Example	What it does
			<p>The <code>--config</code> flag identifies the configuration file if you chose not to use the default <code>deployer.conf</code> file name.</p> <p>The EULA is automatically accepted.</p>
Insecure start of csstart	<code>start [--config] --insecure --eula accepted</code>	<code>csstart start --insecure --eula accepted</code>	<p>Starts the Foundation base appliance without checking the vCenter certificate (ESX) or SSH key (KVM) before creating the base appliance. Virtual appliances are also started without certificate checks.</p> <p>The <code>--config</code> flag identifies the configuration file if you chose not to use the default <code>deployer.conf</code> file name.</p> <p>The EULA is automatically accepted.</p>
Start a web server listening on a specific port	<code>gui [--listen ipaddr:port]</code>	<code>csstart gui [--listen 127.0.0.1:5000]</code>	<p>The <code>ipaddr:port</code> defaults to <code>127.0.0.1:5000</code> which means the web server only listens to a web browser running on the local host. A very common value for the <code>listen</code> flag is <code>--listen 0.0.0.0:5000</code>. The web server listens for connections from any host, such as your workstation.</p>

csadmin CLI and OpenStack CLI

For an explanation of csadmin CLI commands, see the *Working with the csadmin CLI* appendix in the *HP CloudSystem 8.0 Administrator Guide* at [Enterprise Information Library](#).

For a list of all OpenStack Havana CLI commands, see [OpenStack Documentation for Havana releases](#).

Additional CLI tasks

- [Using the csstart CLI to install the Foundation base appliance \(page 64\)](#)
- [Enabling REST API for storage drivers \(page 66\)](#)
- [Using the CLI to access the Enterprise console \(page 66\)](#)

Using the csstart CLI to install the Foundation base appliance

Procedure 18 Using the csstart CLI to install the Foundation base appliance

1. Log in to the management hypervisor.
2. Run the command to create the **deployer.conf** configuration file:

```
./csstart create-config
```

This will create a sample configuration file. The default name is **deployer.conf**, but you can specify a unique name by putting it inside the `--config` tag.

3. Open the config file:
`vi deployer.conf`
4. Fill in the Hypervisor section of the configuration file. The hints provided in the configuration file explain the hypervisor entries.
5. Fill in the Image file location section of the configuration file.
 - If you created the `/CloudSystem/images` directory and placed images there, then enter **default** for each image location. The configuration file hints show each default location.
 - If you created a different directory, then enter the actual path to the image location. Example: `/CloudSystem/templates/CS-SDN-8.0.0.20.qcow2`
6. Fill in the Appliance setup section of the configuration file.
 - Enter a new administrator password to use when accessing the CloudSystem Console.
 - Enter a support access option. **Enabled** allows HP support to access your system in the event of an error. **Disabled** will not allow access.
 - Enter the amount of space to allocate to the Glance disk, in GBs.
7. Fill in the Appliance Networking section of the configuration file. The hints provided in the configuration file explain the hypervisor entries.
8. Add the network configuration to the Network Mapping section. The information below corresponds to the sample provided in the network infrastructure section.

❗ **IMPORTANT:** The following information must match exactly the configuration you created in the network infrastructure section. See, [Configure the network infrastructure on the KVM management hypervisor \(page 36\)](#). You may alter this information to fit your specific configuration needs as long as it corresponds to the setup you performed previously.

NOTE: Delete any trailing spaces after bridge names. The bridge names should not contain any white space.

```
[Data Center Management Network]
bridge="br-dc-mgmt"

[Cloud Management Network]
bridge="br-cloud-mgmt"

[Cloud Data Trunk]
bridge="br-cloud-trunk"

[External Network]
bridge="br-external"
```

9. Save and close the configuration file:
`:wq`
10. Run the script to create the Foundation base appliance:
`./csstart start --[type of security] --eula accepted`
 See [csstart commands \(page 63\)](#) for details on the secure, semi-secure or insecure mode for csstart.

NOTE: You can modify the above command if you want to generate a log file, which is helpful in the event of an error. Use `./csstart start -v --log-file <name of log file>`.

11. Verify that the Foundation base appliance was created on the management hypervisor:
 The SDN appliance and network node appliances are created later after entering Cloud Networking settings in the CloudSystem Console.

-
- ❗ **IMPORTANT:** Do not move or delete images after you create the Foundation base appliance. In order to speed up virtual machine boot times and save disk space, `csstart` does not make a full copy of the image. A copy is shared across all of the virtual machines.
-

See [Troubleshoot installation issues \(page 52\)](#).

Next step: [Setting up the CloudSystem Console for the first time \(page 44\)](#)

Enabling REST API for storage drivers

This is a condensed version of the OpenStack instructions. You can see the complete instructions here: [Enabling the HP 3PAR Fibre Channel and iSCSI Drivers](#)

Prerequisites

- **HP3PARFCDriver** is installed with OpenStack software
- **HP3PARISCSIDriver** is installed with OpenStack software

Procedure 19 Enabling REST API for storage drivers

- Verify that the HP 3PAR WebServices API server is enabled and running on the HP 3PAR storage system.
 - a. Using administrator credentials, log on to the HP 3PAR storage system:

```
#ssh 3parad@<HP 3PAR IP Address>
```
 - b. Check the current state of the WebServices API server:

```
#showwsapi
```
 - c. If the WebService API server is disabled, then start it:

```
#startwsapi
```
 - d. If the HTTP or HTTPS state is disabled, enable one of them:

```
#setwsapi --http enable
```

```
#setwsapi --https enable
```

NOTE: If you need a list of WebService API commands, type `setwsapi -h`. A list of Web Service commands will display.

Using the CLI to access the Enterprise console

You can log in to the Enterprise appliance and view configuration files and network properties using the following commands:

- `virsh console enterprise` with root credentials gives you access to the Enterprise appliance
- `ifconfig` shows all interfaces created for appliance
- `Ctrl+Q` exits the Enterprise console

B Configuring additional providers for CloudSystem Enterprise

HP Cloud Service Automation (HP CSA) is the administrative portal for the Enterprise appliance. You can configure HP CSA to allow Enterprise to connect to HP Matrix Operating Environment (Matrix OE), CloudSystem Foundation, and HP Operations Orchestration (OO) Central.

When Enterprise is installed, a **CloudOS** provider is already configured. This provider allows Enterprise to provision instances in Foundation.

Use the procedures in this appendix to create additional connections between HP CSA, OO Central and Matrix OE.

- [Configuring HP Operations Orchestration to integrate with HP CSA \(page 67\)](#)
- [Importing Operations Orchestration flows \(page 69\)](#)
- [Importing a service design \(page 70\)](#)
- [Configuring a Matrix OE resource provider \(page 71\)](#)

You can find a list of related HP CSA documentation in the [Enterprise Information Library](#).

Configuring HP Operations Orchestration to integrate with HP CSA

OO Central is part of the CloudSystem Foundation base appliance. You can configure OO Central to integrate with HP CSA. The required configuration steps are listed below.

- [Configuring an internal user \(page 67\)](#)
- [Deploying required content packs to HP CSA \(page 68\)](#)
- [Deploying the HP CSA content pack \(page 68\)](#)
- [Configuring system accounts for the HP CSA content pack \(page 69\)](#)
- [Configuring system properties for the HP CSA content pack \(page 69\)](#)

NOTE: In the following instructions, `$CSA_HOME` is the directory where HP CSA resides. In Enterprise, `$CSA_HOME = /ci/usr/local/hp/csa/`.

In CloudSystem, SSL is already configured between HP CSA and OO Central.

Procedure 20 Configuring an internal user

The internal user configures OO Central for HP CSA and imports the OO flows. When importing flows, this user is configured in the OO input file used by the process definition tool.

1. Log in to OO Central (`https://<cs_foundation_ip_or_hostname>/oo`).
2. Select **System Workspace**.

The **System Workspace** screen displays.

3. Select **Security**→**Internal Users**.
4. Click **Add**.
5. In the **User Name** field, type:
`csaoouser`
6. In the **Password** field, type:
`cloud`
7. In the **Roles** field, type:
`ADMINISTRATOR, SYSTEM_ADMIN`
8. Click **Save**.
9. Log out of OO Central and log back in as the internal user `csaoouser`.

Procedure 21 Deploying required content packs to HP CSA

Download the following content packs from [HP Live Network – Operations Orchestration](#) to a Windows or Linux staging server.

- oo10-sm-cp-1.0.0
- oo10-sa-cp-1.0.2



IMPORTANT: Make sure to deploy these required content packs before deploying the HP CSA content pack.

1. From OO Central, select **Content Workspace**.
The **Content Workspace** displays.
2. From the **Flow Library** tab, select **Deploy New Content**.
The **Deploy New Content** dialog displays.
3. Click **Add**.
4. Browse to the staging server that contains the content packs you downloaded from HP Live Network.
The staging server can be a Windows or Linux server.
5. Select oo10-sm-cp-1.0.0 and click **Open**.
6. Click **Deploy**.

NOTE: The deployment can take several minutes. The cursor displays the “busy” icon during deployment.

You can find information about the success of the deployment in the **Deployment Result** section.

7. Repeat steps 3-6 for the oo10-sa-cp-1.0.2 content pack.
8. Click the **Close** button to return to the **Content Workspace**.

Procedure 22 Deploying the HP CSA content pack

Make sure the required content packs are deployed in OO before you complete this procedure.

1. Copy the \$CSA_HOME/CSAKit-4.0/OO Flow Content/oo10-csa-cp-4.0.0.jar file from the Enterprise appliance to your staging server.
 - a. From the Enterprise appliance console, enable the cloudadmin user access through the csadmin command line interface (CLI).
See the **Working with csadmin** appendix in the *HP CloudSystem 8.0 Administrator Guide* at [Enterprise Information Library](#).
 - b. When enabled, log in to the Enterprise appliance console as cloudadmin.
 - c. Copy the \$CSA_HOME/CSAKit-4.0/OO Flow Content/oo10-csa-cp-4.0.0.jar file from the Enterprise appliance to the staging server:

```
scp /ci/usr/local/hp/csa/CSAKit-4.0/OO Flow Content/oo10-csa-cp-4.0.0.jar user@destination:file_path
```
2. From the CloudSystem Console, select **Integrated Tools**.
3. Log in to OO Central and navigate to **Content Workspace**.
4. Select **Deploy New Content**.
5. Click **Add**.
6. Select the oo10-csa-cp-4.0.0 content pack and click **Open**.
7. Click **Deploy**.

NOTE: The deployment may take several minutes. The cursor displays the “busy” icon during the deployment.

You can find information about the success of the deployment in the **Deployment Result** section.

8. Click **Close** to return to the **Content Workspace**.

Procedure 23 Configuring system accounts for the HP CSA content pack

There are three system accounts that must be set up to support the HP CSA content pack.

1. From the **Content Workspace** in OO Central, select **Configuration Items**→**System Accounts**.
2. Click **Edit**.
3. In the **System Account Name** field, type:
`CSA_REST_CREDENTIALS`
4. In the **User Name** field, type:
`ooInboundUser`

NOTE: The **User Name** configured for the **SA_REST_CREDENTIALS System Account** setting must match the **Override Value** configured for the **CSA OO_USER System Property** setting.

5. In the **Password** field, type:
`cloud`
6. Click **Save**.
7. Click **Edit**.
8. In the **System Account Name** field, type:
`CSA_SERVICEMANAGER_CREDENTIALS`
9. In the **User Name** field, type:
`falcon`
10. Leave the **Password** field blank.
11. Click **Save**.

Procedure 24 Configuring system properties for the HP CSA content pack

1. From the **Content Workspace** in OO Central, select **Configuration Items**→**System Accounts**.
2. Click **Edit**.
3. In the **Name** field, type `CSA_REST_URI`.
4. In the **Override Value** field, type
`https://ENTERPRISE_APPLIANCE_IPADDRESS_OR_FQDN/csa/rest`.
5. Click **Save**.

Importing Operations Orchestration flows

OO flows are imported to HP CSA with the Process Definition Tool. This tool creates an HP CSA process definition for every imported OO flow. The process definitions are associated with a process engine, which corresponds to the OO system containing the imported flows. HP CSA uses the flows to perform lifecycle actions and submit delegated approvals.

- [Creating a database properties file \(page 69\)](#)
- [Creating an Operations Orchestration input file \(page 70\)](#)
- [Running the process definition tool \(page 70\)](#)



TIP: HP recommends that you generate sample database properties files and an input file. Use the following steps to create these files.

Procedure 25 Generating sample database properties files and an input file

1. Navigate to the `$CSA_HOME/Tools` directory.
2. Run the command:

```
sudo /ci/usr/local/hp/csa/openjre/bin/java -jar ProcessDefinitionTool/process-defn-tool.jar -g
```

Procedure 26 Creating a database properties file

1. Navigate to the `$CSA_HOME/Tools` directory.

2. In the working directory, make a copy of the PostgreSQL sample database properties file, and rename the copy to db.properties: `sudo cp PostgreSQLInputSample.properties db.properties`
3. Edit the db.properties file and make the following name changes:
 - `db.url=jdbc:postgresql://127.0.0.1:5432/csadb` to `db.url=jdbc:postgresql://127.0.0.1:5432/csa`
 - `db.user=csadbuser` to `db.user=csa`
 - `db.password=ENC(UUV/PSwS9If1NURGsObYPQ==)` to `db.password=csa`
4. Save and close the file.

Procedure 27 Creating an Operations Orchestration input file

This procedure uses the sample files that were generated when you performed the tip above. If you did not follow the tip instructions, complete them now.

1. In the working directory (\$CSA_HOME/Tools), make a copy of the sample input file HPOOInputSample.xml and rename it to HPOOInfoInput.xml: `sudo cp HPOOInputSample.xml HPOOInfoInput.xml`.
2. Update the following attributes and values for all ooengine entries in the HPOOInfoInput.xml file:
 - `truststore="/ci/usr/local/hp/csa/openjre/lib/security/cacerts"`
 - `url="https://<foundation_ipaddress_or_hostname>/PAS/services/WSCentralService"`
 - `username="csaouser"`
 - `password=" cloud"`
 - `Truststorepassword: "changeit"`
3. Save and close the file.

Procedure 28 Running the process definition tool

- Execute the following commands from the Enterprise appliance to run the process definition tool:
 - `cd /ci/usr/local/hp/csa/Tools`
 - `sudo /ci/usr/local/hp/csa/openjre/bin/java -jar process-defn-tool.jar -d db.properties -i HPOOInfoInput.xml`

Importing a service design

Use the Cloud Service Management Console to import a service design.

Procedure 29 Importing a service design

1. Copy all content in the CSA_HOME/CSAKit-4.0/Content Archives folder from the Enterprise appliance to a staging server.
 - a. Log in to the Enterprise appliance console as cloudadmin.
See the **Working with csadmin** appendix in the *HP CloudSystem 8.0 Administrator Guide* at [Enterprise Information Library](#).
 - b. Copy the CSA_HOME/CSAKit-4.0/Content Archives folder to an external device. From there it can be imported to HP CSA.
 - c. Run the following copy command:


```
scp /ci/usr/local/hp/csa/CSAKit-4.0/Content Archives/
<file_path> user@destination:file_path
```
2. From the CloudSystem Console, select **Enterprise**.
3. From the **Tools** pane, select **Cloud Service Management Console**.
4. Navigate to **Designs**→**Sequenced**.
5. Select **Import** and browse to the folder you copied in step 1.

6. Click **Import**.

NOTE: For additional information about the process definition tool, see *HP Cloud Service Automation – Process Definition Tool* in the [Enterprise Information Library](#).

Configuring a Matrix OE resource provider

After importing a service design to Enterprise, you are ready to configure additional providers, such as Matrix OE.

Use the HP CSA documentation to help you complete the following steps:

- Define additional resource providers.
- Associate resource offerings (like the ones imported in the previous section) to the appropriated provider (Matrix OE resource offerings with Matrix OE resource providers).

Refer to the [Enterprise Information Library](#) for HP CSA documentation on configuring a Matrix OE resource provider.

C Configuring a large-scale CloudSystem deployment

In a large-scale deployment, CloudSystem Foundation can manage over 4,000 virtual machine instances. To support this type of deployment, HP recommends that you update the maximum heap size parameter of the `jetty-Atlas` Java web server on the Foundation base appliance.

The best practice is to perform the procedure in this section **after** the Foundation base appliance is successfully deployed using `cssstart`, and **before** CloudSystem is made available for use by end users.

See also “Working with the `csadmin` CLI” in the *HP CloudSystem 8.0 Administrator Guide* at [Enterprise Information Library](#).

Prerequisites

- Minimum required privileges: Infrastructure administrator
- The `csadmin` CLI package is installed on the CloudSystem Foundation base appliance.

Procedure 30 Updating the maximum heap size of the `jetty-Atlas` Java web server

1. From the `csadmin` CLI, enable the **cloudadmin** user access on the Foundation base appliance.
2. Open the VNC Console terminal window to the Foundation base appliance.
3. Log in as the `cloudadmin` user.
4. Change the maximum heap size for the `jetty-Atlas` Java web server from `-Xmx512m` to `-Xmx750m`.

Example:

```
[cloudadmin@Basehost ~]$ sudo vi /ci/etc/jvm.d/jetty-Atlas
[cloudadmin@Basehost ~]$ cat /ci/etc/jvm.d/jetty-Atlas
-Xss256k
-Xms256m
-Xmx750m
-XX:PermSize=128m
-XX:ReservedCodeCacheSize=32m
-XX:+UseCompressedOops

-verbose:gc
-XX:+PrintGCDetails
-Xloggc:/ci/jetty-Atlas/logs/gc.log
-XX:+UseGCLogFileRotation
-XX:NumberOfGCLogFiles=2
-XX:GCLogFileSize=1m
```

5. Save the changes.
6. Restart the `jetty-Atlas` Java web server using the following command:

```
[cloudadmin@Basehost ~]$ sudo crm resource restart JettyAtlas
```