Cisco Integrated System for Microsoft Azure Stack Hub Operations Guide

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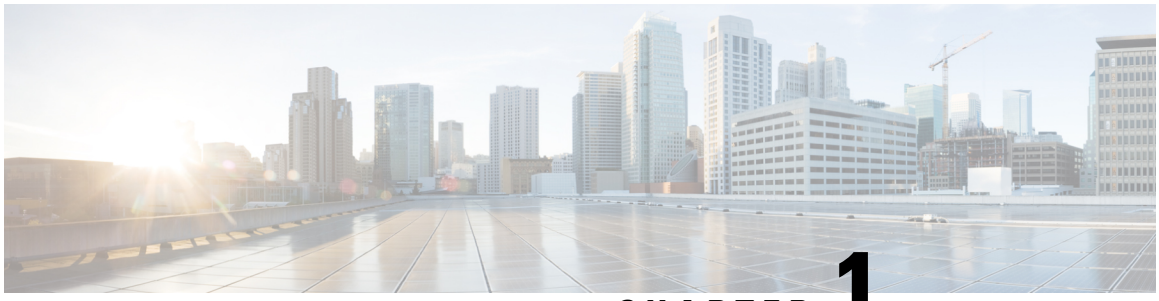
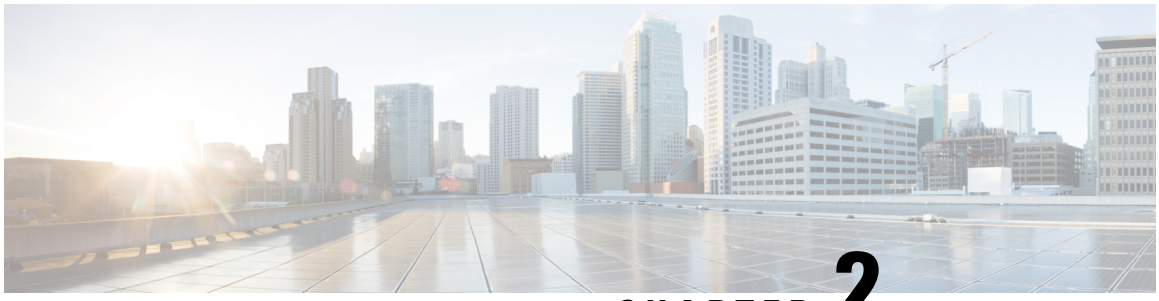


CHAPTER 1

Overview

Overview of the Guide

This guide is intended for Azure Stack Hub operators who own and maintain the life cycle of Azure Stack Hub hardware. This guide is supplemental to the **How-to guides** > **Manage Azure Stack Hub** section of the Azure Stack Hub operator documentation at https://docs.microsoft.com/en-us/azure-stack/operator/.



CHAPTER 2

Support Guidance

Support Case Creation

After the installation is completed, you must go through the digital onboarding process with the professional services engineer as part of the handover process. This will ensure that your system is covered under a Cisco Service Contract, and that your contract number and contact information are updated in the Cisco Service Contract System (CSCC).

There are three ways to open a Cisco support case:

- Contact TAC by Phone: Cisco Worldwide Contacts
- Contact TAC by Email: tac@cisco.com (additional language support in Worldwide contact link)
- Open Case through Support Case Manager

Support Case Manager

Support Case Manager (SCM) provides end-to-end case management functionality. To use SCM, you need the user ID and password of your Cisco profile, a valid service contract number, the serial number or virtual license number of the product that requires support, and a supported Internet browser. Supported browsers include Mozilla Firefox Versions 10 and later, Google Chrome Versions 20 and later, Safari Versions 5 and later, and the latest version of Microsoft Internet Explorer.

- To register for a Cisco user ID for SCM, open this url in your browser: https://idreg.cloudapps.cisco.com/idreg/register.do
- To request access to SCM, provide your Cisco user ID and contract number to web-help-sr@cisco.com

See SCM At-A-Glance for screenshots of this process.

Logging in to Support Case Manager

Procedure

Step 1 Open this URL in your browser: https://mycase.cloudapps.cisco.com.

Step 2 Enter the user ID and password of your Cisco profile, and click **Log In**.

Opening a Case through Support Case Manager

Before you begin

Log in to Support Case Manager.

Procedure

Step 1 On the home page, click **Open New Case** to advance to the **Entitlement** page.

Step 2 In the **Find Product by Serial Number** field, enter the server or switch serial number.

This information is provided on the service contract.

Step 3 Click **Search**.

Step 4 In the list of search results, click the desired product for this case.

Step 5 Click **Next**.

This brings you to the **Describe Problem** page. A severity is assigned based on the product type, contract and user permissions.

Step 6 Enter the required case details such as **Title** and **Description** that summarizes the request. The **Title** accepts a maximum of 80 characters and **Description** accepts a maximum of 32,000 characters.

Step 7 In the **Technology** field, click **Browse** to open the **Select Technology** window and search for **Azure Stack**.

Step 8 Select **Azure Stack - (Solution Support Contract Required)** and click **Select**.

Step 9 From the **Problem Area** drop-down list, select the appropriate failure.

Step 10 Review the **Contact Preference** area. Contact information that you enter here overrides the default information and applies only to this case.

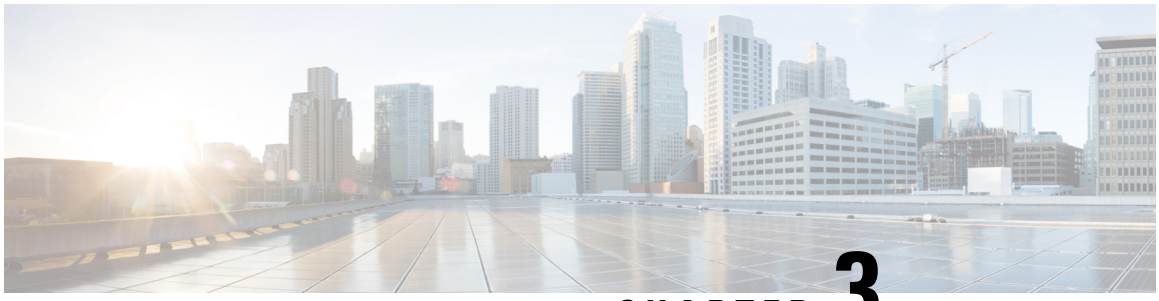
Step 11 Click **Submit**.

Based on your entitlement level a Cisco Solution Support engineer will contact you. Cisco Solution Support is the single point of contact for managing Cisco product issues and coordinating with the Microsoft Azure Stack support team.

Related Cisco Integrated System for Microsoft Azure Stack Hub Documentation

The complete list of all Cisco Integrated System for Microsoft Azure Stack Hub documentation is available at the following URL:

Cisco Integrated System for Microsoft Azure Stack Hub



CHAPTER 3

Start and Stop Azure Stack Hub

Start and Stop Azure Stack Hub

You can shut down and restart Azure Stack Hub services in the Cisco Integrated System for Microsoft Azure Stack Hub. Shutting down physically powers off the entire Azure Stack Hub environment. Starting up powers on all the infrastructure and returns tenant resources to the power state that they were in before shutdown. The following procedures illustrate how you can properly shut down and restart Azure Stack Hub services.

For the latest version of the Microsoft specific steps, refer to the Microsoft documentation.

Stop Azure Stack Hub

To shut down Azure Stack Hub, do the following:

Procedure

Step 1 Prepare all workloads running on your Azure Stack Hub environment's tenant resources for the upcoming shutdown.

Step 2 Open a Privileged Endpoint (PEP) session from a machine with network access to the Azure Stack Hub ERCS VMs.

For detailed information, see Using the privileged endpoint in Azure Stack Hub.

Step 3 From the PEP, run **Stop-AzureStack**.

Step 4 Wait for all physical Azure Stack Hub nodes to power down.

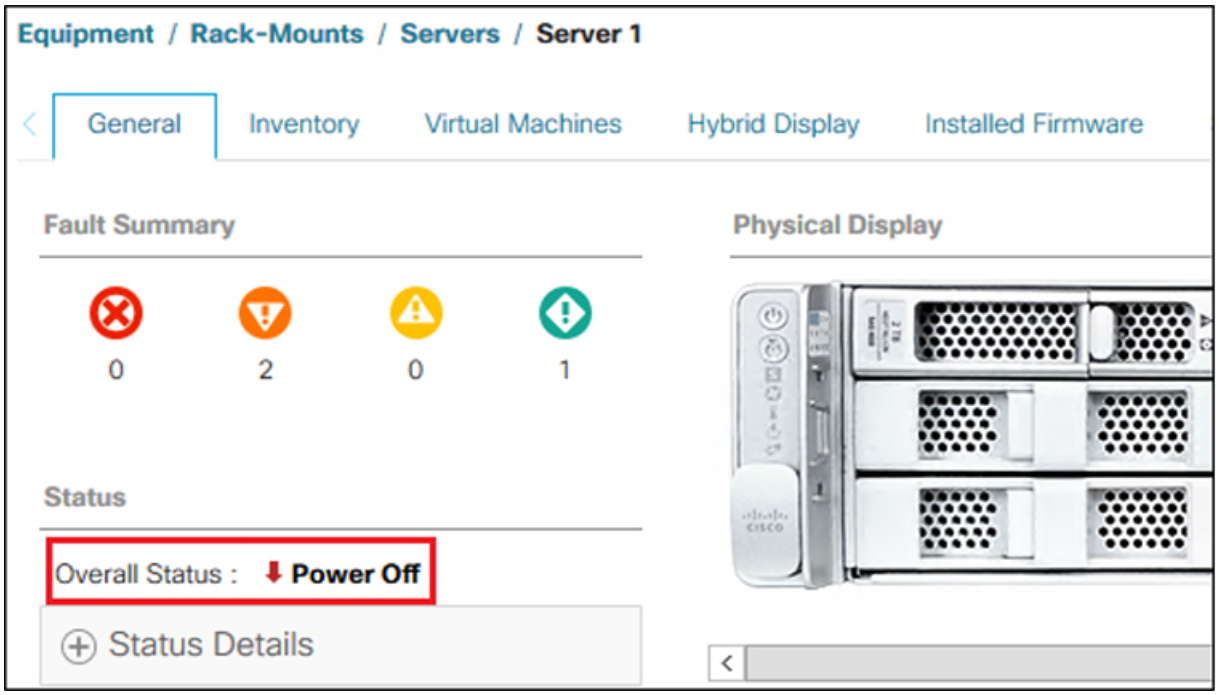
Step 5 Log into Cisco UCS Manager (https://<*UCS_Manager_IP*>) by using the admin credentials.

Note The Cisco UCS Manager IP Address is available in the Cisco deployment worksheet addendum document provided during the deployment.

Step 6 From the Cisco UCS Manager GUI, in the **Navigation** pane, click **Equipment**.

Step 7 Expand **Equipment** > **Rack Mounts** > **Servers**, and ensure that all the servers are in the **Power Off** state.

Step 8 After all the physical servers are in the **Power Off** state, you can remove power from the Azure Stack Hub rack.



Start Azure Stack Hub

To start Azure Stack Hub, do the following regardless of how Azure Stack Hub stopped:

Procedure

Step 1 Log into Cisco UCS Manager (https://<*UCS_Manager_IP*>) by using the admin credentials.

Note The Cisco UCS Manager IP Address is available in the Cisco deployment worksheet addendum document provided during the deployment.

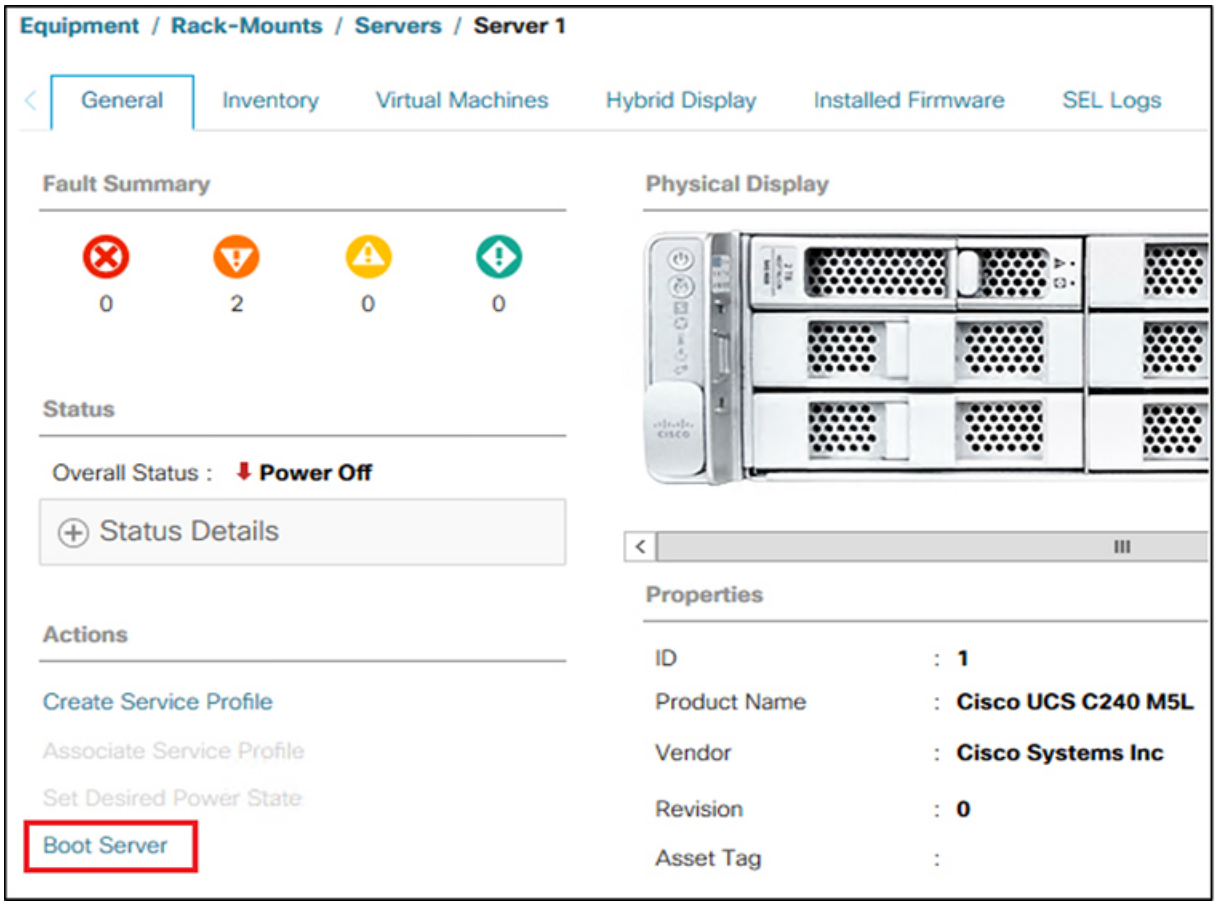
Step 2 In the **Navigation** pane, click **Equipment**.

Step 3 Expand **Equipment** > **Rack Mounts** > **Servers**.

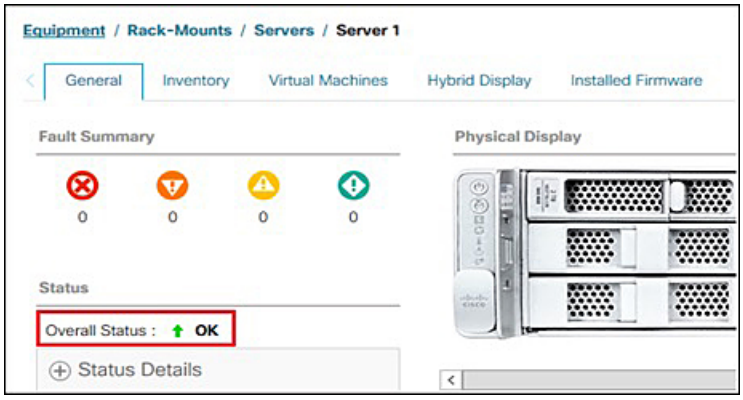
Step 4 Choose the server that you want to boot.

Step 5 In the **Work** pane, click the **General** tab.

Step 6 In the **Actions** area, click **Boot Server**.



After the server has booted, the **Overall Status** field on the **General** tab displays an **OK** status in a few minutes.



Step 7 Wait until the Azure Stack Hub infrastructure services starts.

Azure Stack Hub infrastructure services can require two hours to finish the start process. You can verify the start status of Azure Stack Hub with the Get-ActionStatus cmdlet.

Step 8 Ensure that all your tenant resources have returned to the state that they were in before shutdown. Workloads running on tenant resources may need to be reconfigured after startup by the workload manager.

Get the Startup Status for Azure Stack Hub

Get the status for the Azure Stack Hub startup routine with the following steps:

Procedure

Step 1 Open a Privileged Endpoint (PEP) session from a machine with network access to the Azure Stack Hub ERCS VMs.

For detailed information, see Using the privileged endpoint in Azure Stack Hub.

Step 2 From the PEP, run **Get-ActionStatus Start-AzureStack**.

Troubleshoot Startup and Shutdown of Azure Stack Hub

Perform these steps if the infrastructure and tenant services do not successfully start 2 hours after you power on your Azure Stack Hub environment.

Procedure

Step 1 Open a Privileged Endpoint (PEP) session from a machine with network access to the Azure Stack Hub ERCS VMs.

For detailed information, see Using the privileged endpoint in Azure Stack Hub.

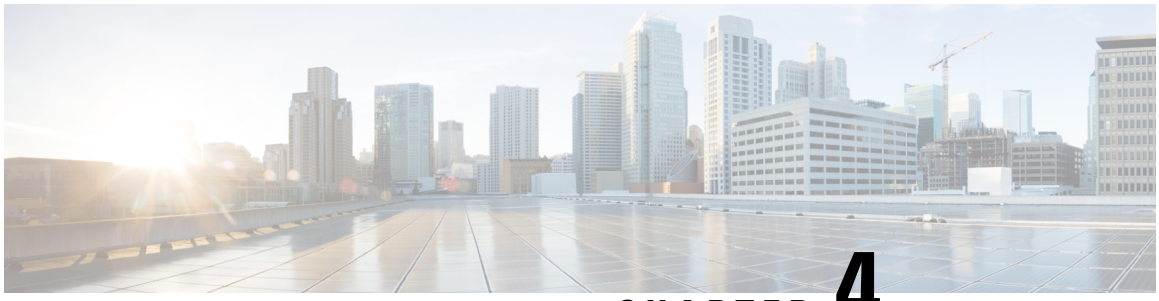
Step 2 From the PEP, run **Test-AzureStack**.

Step 3 Review the output, and resolve any health errors.

For more information, see Run a validation test of Azure Stack Hub.

Step 4 From the PEP, run **Start-AzureStack**.

Step 5 If running Start-AzureStack results in a failure, contact Microsoft Customer Services Support.



CHAPTER 4

Secret Rotation

Secret Rotation

Azure Stack Hub uses internal and external secrets to maintain secure communication between the Azure Stack Hub infrastructure resources and services. For more information on Azure Stack Hub specific secret rotation, see https://docs.microsoft.com/en-us/azure-stack/operator/azure-stack-rotate-secrets?view=azs-2002.

Cisco recommends using strong passwords for all the user accounts. This chapter covers the instructions to rotate the secrets of hardware management user accounts.

Cisco Azure Stack Hub has the following default user accounts created during the installation. The user accounts are configured with the customer provided password during the installation.

Device	Account	Purpose
Cisco UCS	admin	Default administrator account with the administrator role on Cisco UCS manager
	UCSAzSAdmin	Additional administrator account with the administrator role on UCS manager
	IpmiUser	Baseboard management controller (BMC) user account.
Nexus	admin	Default administrator account with the network-administrator role
	azsadmin-<5 character random string>	Additional administrator account with the network-administrator role

Rotating Secrets of Cisco Nexus Top of Rack Switch

To rotate passwords for each user account in Cisco Nexus Top of Rack switch, run the following command:

```
n9k-1# conf t
n9k-1(config)# username <username> password <new password>
```

Note Cisco Nexus Top of Rack switches are setup to allow only strong passwords. Ensure that you replace an existing password with a strong password which meets the requirements documented at the Enabling Password-Strength Checking section in the Cisco Nexus 9000 Series NX-OS Security Configuration Guide.

Rotating Secrets of Cisco UCS manager

Cisco UCS Manager is the control center for the UCS server infrastructure. Cisco UCS manager can be accessed using supported browser on any computer which has access to the out-of-band management network of Azure Stack Hub.

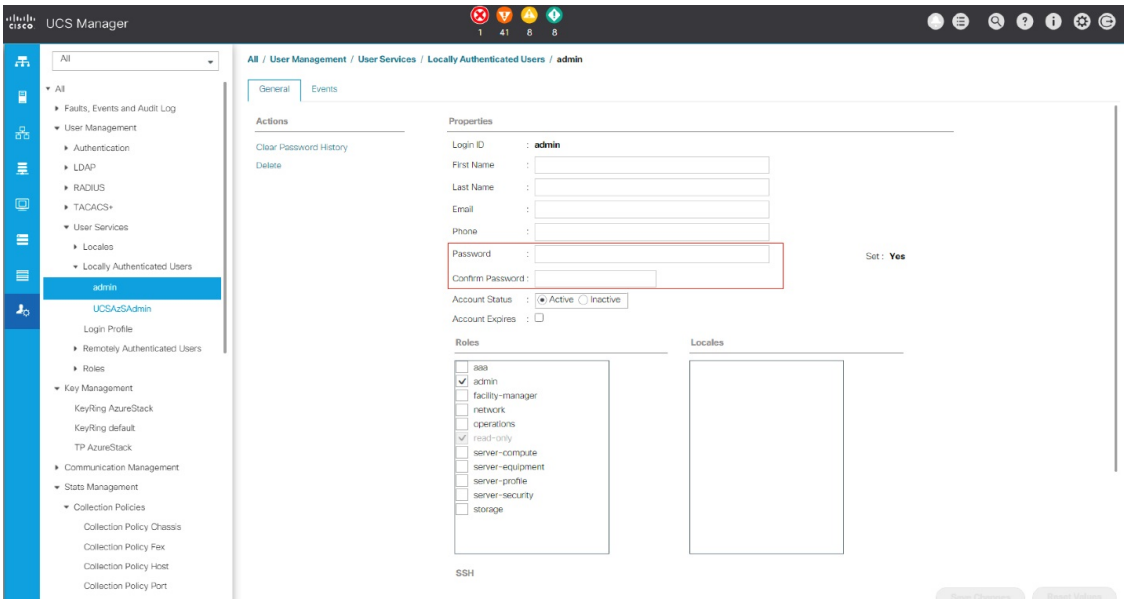
Note Never reboot any servers or other components using Cisco UCS manager, unless requested by Cisco support technician. Any reboot operation from Cisco UCS manager can result in the temporary or permanent data loss.

As described in the Table, Cisco UCS manager has three user accounts. To change the passwords on the user accounts, perform the following tasks:

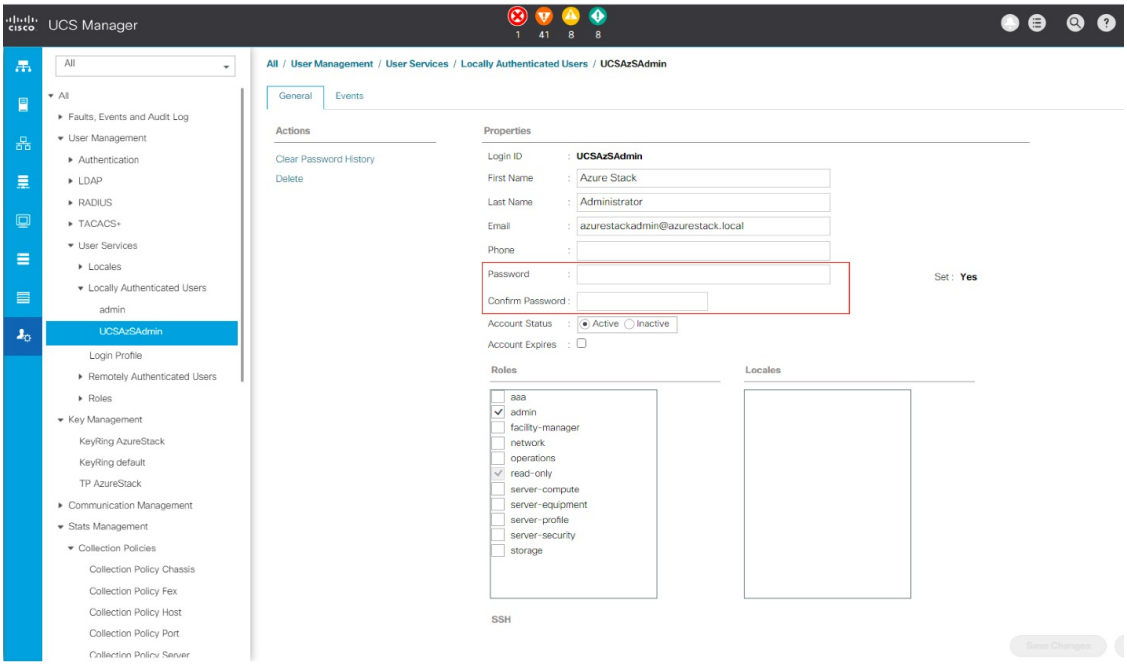
Procedure

Step 1 In any supported browser, enter `https://<UCS Manager IP>` and log into Cisco UCS manager using admin credentials.

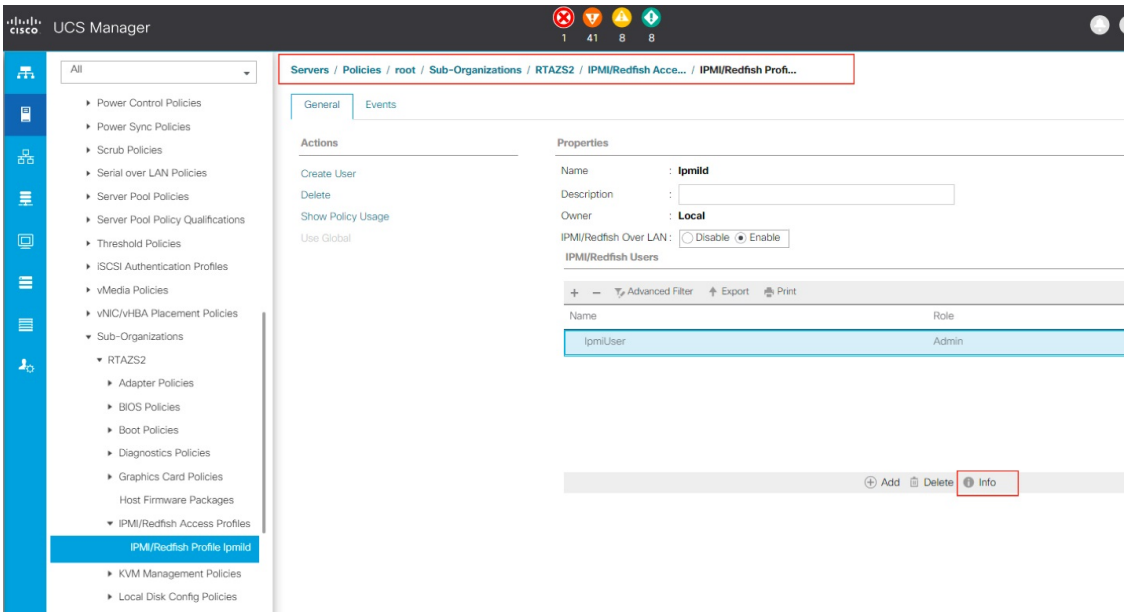
Step 2 In the **Navigation** pane, click **Admin**. Expand **All** > **User Management** > **User Services** > **Locally Authenticated Users** and then select **admin** user. In the **Properties** area on the right, enter the new password in the **Password** and **Confirm Password** fields. Click **Save Changes** to complete the password change.



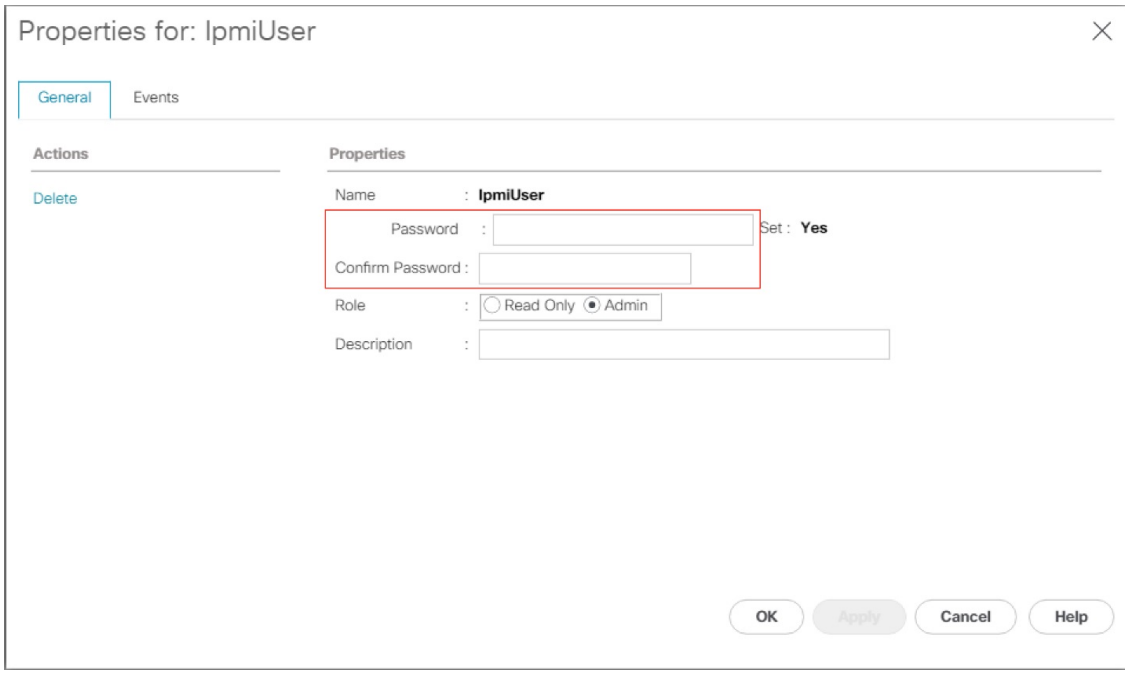
Step 3 Under **All** > **User Management** > **User Services** > **Locally Authenticated Users** , select **UCSAzSadmin** user. In the **Properties** area on the right, enter the new password in the **Password** and **Confirm Password** fields. Click **Save Changes** to complete the password change.



Step 4 In the **Navigation** pane, click **Servers**. Expand **Servers** > **Policies** > **root** > **Sub-Organizations** > **[Organization name provided during the deployment]** > **IPMI/Redfish Access Profiles** and then select **IPMI/Redfish profile IpmiId**. In the **Properties** area on the right, under the **IPMI/Redfish Users** sub-area, select **IpmiUser** and click **info**.



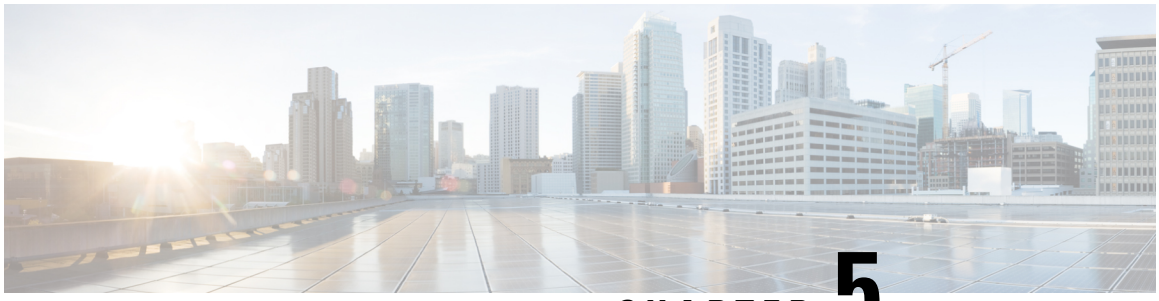
Step 5 Enter the new password in the **Password** and **Confirm Password** fields. Click **Save Changes** to complete the password change.



Step 6 Open an Elevated PowerShell window and connect to the Azure Stack Hub Emergency Recovery console using a “Cloudadmin” account. Update the baseboard management controller (BMC) credential by running the `set-bmccredential` command with the `-BypassBMCUpdate` flag.

Note The order should be first update BMC credentials on each server from Cisco UCS Manager (Step 4 and 5) and then run the `set-bmccredential` command (Step 6). For more information, refer to Microsoft documentation.

In the generic Azure Stack Hub, the `set-bmccredential` command is capable of updating BMC credentials on the BMC controller of each server along with the update to its internal credential store. But, in Cisco Azure Stack Hub, the credentials update on each server is not possible as the server BMC controllers are controlled using Cisco UCS Manager. Hence, set the new credentials on the BMC controller using Cisco UCS manager and then use the `set-bmccredential` command to update the internal credential store on Azure Stack Hub.



CHAPTER 5

Upgrade Firmware

Firmware Upgrade Overview

This section includes the firmware and driver update procedure for Cisco Integrated System for Microsoft Azure Stack Hub. Cisco periodically releases system update for the Azure Stack Hub platform. These system updates include updated firmware and drivers that improve the platform lifecycle and resolve known defects. Customers are required to update their systems to the latest system update within 60 days of the system update release date.

The following components of the Cisco appliance require periodic firmware updates to resolve known functional and security issues:

- Top-of-Rack Switches
- Cisco UCS
  - Cisco UCS Manager
  - UCS Fabric Interconnects
  - UCS Fabric Extenders
  - UCS C-Series rack server components, including BIOS, SAS HBA, NIC, HDD, and SSD
  - Server device drivers

For assistance with firmware upgrade issues or errors, refer the Support Guidance chapter to open a Cisco TAC case for Azure Stack Hub support.

Note Cisco recommends performing firmware upgrade during the scheduled maintenance window.

Cisco Integrated System for Microsoft Azure Stack Hub firmware download portal can be accessed by selecting Integrated System Azure Stack - System Updates on UCS C-Series Rack-Mount UCS-Managed Server Software Download page. Also, it can be set up to notify you about the availability of the new firmware. Cisco highly recommends that you sign up for these notifications.

The following software components hosted on Microsoft Azure Stack Hub firmware download portal are required for the firmware upgrade procedure:

Component	Description
ucs-6300-k9-bundle-infra.<*version number*>.A.bin	UCS Infrastructure Firmware
ucs-k9-bundle-c-series.<*version number*>.C.bin	UCS Server Firmware
nxos.<*version number*>.bin	ToR Switch Firmware
<*OEM extension version number*>.zip	Zip file containing the OEM Extensions Package. The OEM Extensions Package is made of two files. One zip file and one xml file.
Cisco_UCS_AzureStack_FwUpdate_<*version number*>.zip	Firmware and Driver Update Automation (CASPU)

Identifying Installed Firmware

Based on when the system is installed and updated, some of the components or all the components of Micorsoft Azure Stack Hub hardware requires firmware upgrade. This section provides the procedure to identify installed firmware.

UCS Infrastructure and Server Firmware

Procedure

Step 1 Log into Cisco UCS Manager (https://<UCS_Manager_IP>) by using the admin credentials, through a SSH client, such as Putty.

Step 2 Check the version using the `show version` command.

```
UCS-B# show  version
System version: 4.0(4b)
```

Step 3 On the Microsoft Azure Stack Hub firmware download portal, check for the latest firmware version from the posted Cisco UCS firmware files (`ucs-6300-k9-bundle-infra.4.0.4g.A.bin` or `ucs-k9-bundle-c-series.4.0.4g.C.bin`).

The firmware version of bundle image files are same. If the posted firmware version is greater than the installed firmware version, the system requires UCS firmware upgrade. For example, if the installed UCS firmware version is 4.0(4b) and the posted firmware version is 4.0(4g), the system requires UCS firmware upgrade from 4.0(4b) to 4.0(4g).

Note The OEM extension package installation is required to complete UCS firmware upgrade.

Top-of-Rack Nexus Switch Firmware

Procedure

Step 1 Log into Top-of-Rack Nexus switch A by using the admin credentials, through a SSH client, such as Putty.

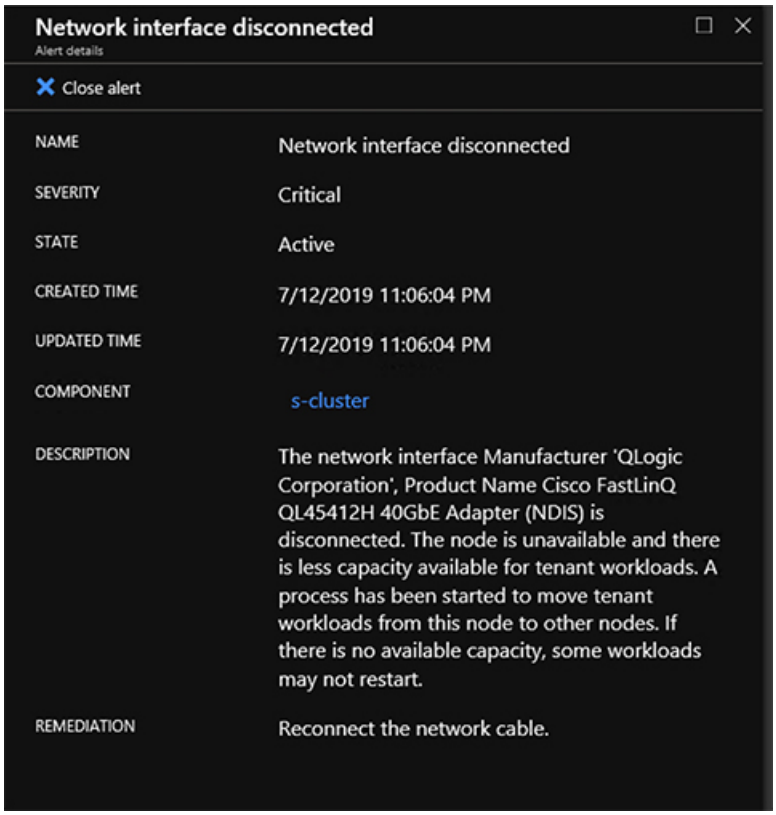
Step 2 Check the version using the `show version | inc NXOS` command.

```
ToR-1# show version | inc NXOS
NXOS: version 7.0(3)I7(4)
NXOS image file is: bootflash:///nxos.7.0.3.I7.4.bin
NXOS compile time:  6/14/2018 2:00:00 [06/14/2018 10:49:04]
```

Step 3 On the Microsoft Azure Stack Hub firmware download portal, check for the latest Nexus switch firmware version from the Nexus switch firmware file (`nxos.7.0.3.I7.8.bin`). If the posted firmware version is greater than the installed firmware version, the system requires Nexus switch firmware upgrade.

Known Behavior During Firmware Upgrade

- During ToR switch upgrade, the admin portal may show a route publication failure alert. This behavior is expected and can be safely ignored. This alert will clear automatically after firmware upgrade.
- During UCS infrastructure firmware upgrade, Cisco UCS Manager shows an alert message to acknowledge server reboot. This alert message must be ignored, as rebooting servers from Cisco UCS manger may result in a down time for Azure Stack Hub and possible data loss. The safe reboot of servers is triggered automatically during OEM extension package installation.
- During UCS infrastructure firmware upgrade, the Azure Stack Hub admin portal may generate the alert shown in the following figure. This behavior is expected and can be safely ignored. This alert will clear automatically after firmware upgrade.



Cisco Azure Stack Hub Platform Upgrade Automation

Firmware upgrade for Cisco Integrated System for Microsoft Azure Stack Hub is a non-disruptive operation, which is fully automated using Cisco Azure Stack Hub Platform Upgrade (CASPU) automation software. With CASPU Cisco customers can upgrade all the components of Azure Stack Hub all at once or in three parts:

- Top-of-Rack Nexus switch upgrade (flag: **UpdateNexus**)
- UCS infrastructure upgrade (flag: **UpdateUCSManager**)
- Server firmware upgrade and driver installation (flag: **UpdateOEMExtension**)

Running CASPU in parts is particularly useful when the host running CASPU cannot access the admin portal and the management IPs of UCS and ToR switches all at the same time. The CASPU configuration file `FirmwareUpdateInputs.xml` consists of flags **UpdateNexus**, **UpdateUCSManager**, and **UpdateOEMExtension** to configure the three-part execution of CASPU. By default, all the flags are marked true, and CASPU tries to upgrade all the components at the same time.

Important Execution order is important for the Azure Stack Hub firmware upgrade. If all the flags are marked true, CASPU automatically selects the correct order. While running CASPU in parts, ensure that you run **UCS infrastructure upgrade and server firmware upgrade staging** before **Server firmware upgrade and driver installation using OEM extension package**.

When CASPU is executed in parts, manually invoke the Azure Stack Hub validation tool (Test-AzureStack) (https://docs.microsoft.com/en-us/azure-stack/operator/azure-stack-diagnostic-test?view=azs-2005) before and after every step to ensure that the Azure Stack Hub is healthy after each operation. When CASPU is executed in default mode (all flags true), CASPU ensures that Azure Stack Hub is healthy before and after each operation.

Azure Stack Hub systems must be running Azure Stack Hub version 1.1907.17.54 or higher before CASPU utilities can be used to update the firmware and OEM Extensions package.

CASPU is written in PowerShell and can be executed from any Microsoft Windows environment that meets the following requirements:

- MS Windows 10, 2016 or 2019 Operating System

Note Ensure that the Operating System has all the latest patches.

- Network connectivity to Management IPs of Nexus ToR switches and UCS
- Network connectivity to the Azure Stack Hub admin portal and privileged endpoints
- All Azure Stack Hub PKI certificates installed
- PowerShell version 5.1 or later installed
- The latest version of PowerShell for Azure Stack Hub installed (https://docs.microsoft.com/en-us/azure-stack/operator/azure-stack-powershell-install)

Note The host running CASPU adds customer provided privileged endpoint VM IP address to the trusted host.

Ensure that the host running CASPU has a reliable wired network connection to Azure Stack Hub. Running CASPU from a computer that connects to Azure Stack Hub over a VPN or an unreliable network is not supported.

In addition to firmware upgrade, CASPU makes the following configuration changes to Azure Stack Hub:

- Sets 9216 MTU for all SVIs and peer link port channel (po10) on both ToR switches. This update addresses the new requirements for ToR switch configuration.
- Makes ACL changes to implement the latest ToR switch security settings required by Microsoft.
- Configures QoS class for the cluster communication traffic on ToR switches and Fabric Interconnects.
- Changes UCS server boot policy settings from Local Disk to Embedded LUN

Configuring Cisco Azure Stack Hub Platform Upgrade Automation

Procedure

Step 1 In the Microsoft Windows environment that meets the earlier mentioned requirements, download the following firmware upgrade components into a folder (for example, c:\azsfirmwareupgrade):

- ucs-6300-k9-bundle-infra.<*version number*>.A.bin
- ucs-k9-bundle-c-series.<*version number*>.C.bin
- nxos.<*version number*>.bin
- <*OEM extension version number*>.zip
- Cisco_UCS_AzureStack_FwUpdate_<*version number*>.zip

Step 2 Run **gci -path** c:\azsfirmwareupgrade **-recurse** | **unblock-file** and unblock all the components.

Step 3 Extract the `Cisco_UCS_AzureStack_FwUpdate_<version>.zip` package.

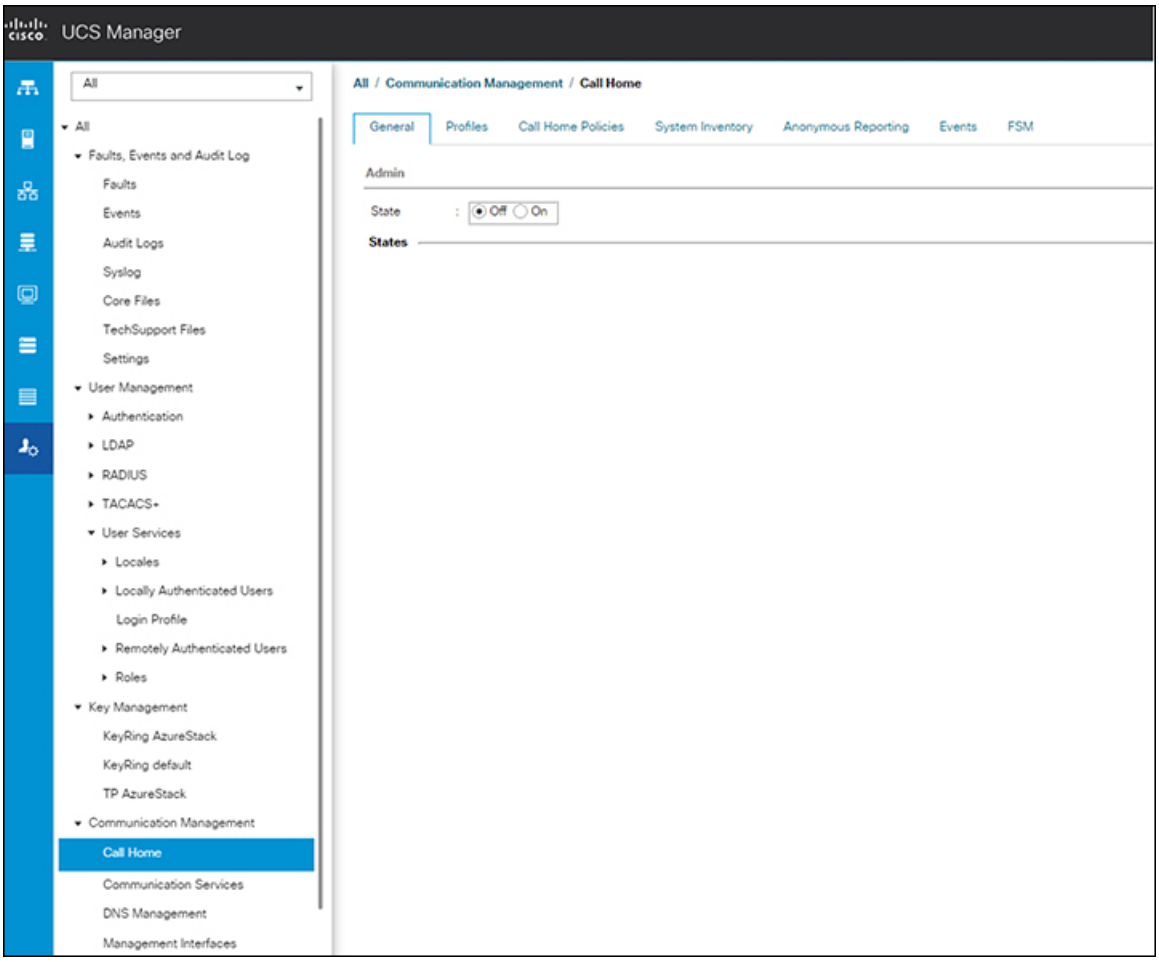
Step 4 Extract the OEM extension package to the `C:\ azsfirmwareupgrade\OEM` folder from the `<OEM extension version number>.zip` file.

Step 5 Update the `FirmwareUpdateInputs.xml` file located inside the `C:\ azsfirmwareupgrade \Cisco_UCS_AzureStack_FwUpdate_<version>\FirmwareUpdate` folder.

Field Name	Description
UpdateNexus (True/False)	Flag to perform Nexus firmware upgrade
UpdateUCSManager (True/False)	Flag to perform UCS infrastructure firmware upgrade and server firmware upgrade staging
UpdateOEM (True/False)	Flag to perform rolling server firmware and driver update
RunAzureStackHubHealthCheck (True/False)	Flag to run Test-AzureStack before Nexus and UCS infrastructure firmware upgrade If the host running CASPU does not have access to the ERCS VM, set this flag to **False**
ToRSwitch1IP	IP address for the Nexus Top-of-Rack switch 1
ToRSwitch1UserName	Nexus switch 1 admin username
ToRSwitch2IP	IP address for the Nexus Top-of-Rack switch 2
ToRSwitch2UserName	Nexus switch 2 admin username
ToRImageFilePath	File path for the Top-of-Rack switch firmware image

Field Name	Description
UCSMIP	IP address of Cisco UCS Manager
UCSMUserName	Cisco UCS Manager admin username
ImagePathInfraBundle	File path for the UCS infrastructure firmware bundle
ImagePathHostBundle	File path for the UCS server firmware bundle
AdminResourceManagerURI	URI for the Azure Stack Hub admin resource manager. Normally located in the AzureStackStampInformation.json provided to you after deployment. For example, https://adminmanagement.usw.m4l.rtazslab.net/
OEMExtensionFolderPath	Folder path for the OEM Extension package `C:\ azsfirmwareupgrade\OEM`
AzureRMUserName	Azure Stack Hub global administrator username
ERCSIPAddress	IP address of ERCS VM
ERCSUserName	ERCS cloud admin username. For example, <local domain>\cloudadmin
TenantId	(Optional). This option is intended for use in a Cloud Solution Provider (CSP) scenario where the operator does not own the tenant domain. In this case, this option allows the tenant ID to be specified for the login. When not specified, the Tenant ID associated with login request is used.
Subscription	(Optional). The optional Subscription field allows a specific subscription GUID to be specified when a none-default subscription needs to be used. The default value is **Default Provider Subscription**.

Step 6 (Optional) If configured for the duration of the firmware upgrade, disable UCS Call Home to avoid unnecessary alerts.



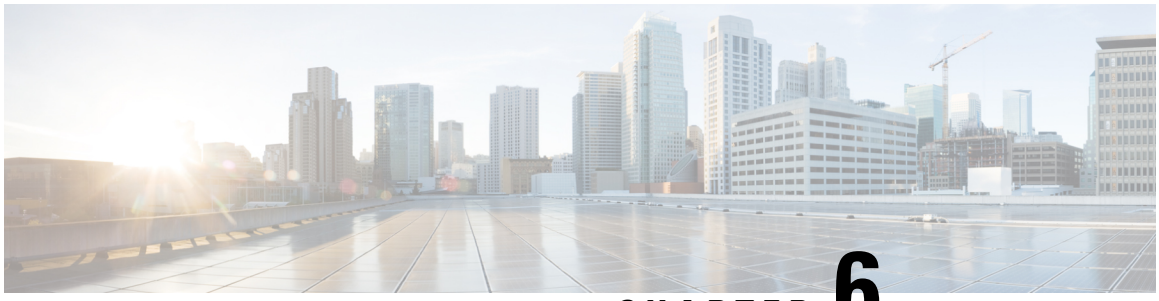
Step 7 Run `C:\ azsfirmwareupgrade \Cisco_UCS_AzureStack_FwUpdate_<version>\FirmwareUpdate \RunFirmwareUpdate.ps1` from an elevated PowerShell window. Provide the required credentials:

Module	Credential Details
UpdateUCSManager	Admin credentials for Cisco UCS Manager
UpdateNexus	Admin credentials for each Nexus ToR switch
UpdateOEMExtension	Azure Stack Hub Global administrator
	Cloudadmin account credentials for Privileged Endpoint access

Note **RunFirmwareUpdate.ps1** can auto install the required PowerShell modules. By default, the script waits for user acknowledgement before installation. If you want the script to install all the required modules without user acknowledgement, you can use the “force” parameter while running the script. For example, **RunFirmwareUpdate.ps1 -force**.

The **UpdateOEMExtension** module only starts the installation on the OEM Extension on Azure Stack Hub. It does not wait for the OEM Extension update to complete. You must monitor the status of the OEM Extension update from the admin portal.

Server firmware upgrade is not complete until the OEM Extension is successfully updated.



CHAPTER 6

Manage Capacity

Physical Memory Capacity Management

Cisco supports memory expansion on Azure Stack Hub servers. Memory expansion is a disruptive operation, and involves shutdown of the Azure Stack Hub system. Following are the guidelines for memory expansion or upgrade:

- All the servers in the Azure Stack Hub have homogeneous hardware configuration. For this reason, you cannot perform memory upgrade only on a single server. You must upgrade the memory on all the servers at the same time.
- Upgrade only to increments supported for M5 — 384 GB, 512 GB and 768 GB using 32 GB DIMMS, 1024 GB or 1536 GB using 64 GB DiMMS.
- You cannot mix and match 32 GB and 64 GB DIMMS

Review the Cisco memory expansion best practices from following links:

https://www.cisco.com/c/dam/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/memory-guide-c220-c240-b200-m5.pdf

https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/c/hw/C240M4/install/C240M4/replace.html

After supported memory is procured, follow the instructions from the following Microsoft guide to perform the memory expansion:

https://docs.microsoft.com/en-us/azure-stack/operator/azure-stack-manage-storage-physical-memory-capacity

Add Scale Unit Nodes

With Azure Stack Hub update 1807 Microsoft supports addition of physical servers to an existing Azure Stack Hub. Cisco customers running Azure Stack Hub version 1807 and above can now order and add nodes to their existing Azure Stack Hub. In the current version of the Add Node capability, Microsoft allows the existing

cluster to be expanded up to a maximum of 16 servers per scale unit. This section covers detailed instructions for the addition of new nodes to an existing Azure Stack Hub system.

Prerequisites for Adding a Node

The following prerequisites must be complete before adding a node:

- Verify that Azure Stack Hub is running update 1807 or above with no errors or warnings on the Azure Stack Hub admin portal.
- Verify that the following components are received as a part of the add node package:
  - Server with the exact same components as other servers in the existing Azure Stack Hub
  - Two QSFP-H40G-CU3M cables
  - UCS port license for 2 ports
- Obtain two CAT 6 cables.
- Ensure that there are no errors or warnings displayed on Cisco UCS Manager. Cisco UCS Manager can be accessed using any computer that has access to the Azure Stack Hub Out-of-Band-Management network. To access Cisco UCS Manager using a Web browser, open https://<*Cisco_UCS_Manager_IP*>. You can find the Cisco UCS Manager IP and admin login credentials in the customer handover information.
- Verify that the UCS service profile template has enough Cisco IMC (Integrated Management Controller)/BMC IPs for newly added nodes. Most of the new deployments after September 2018 will have Cisco IMC IP pools large enough to support 16 servers. However, for older deployments, Cisco IMC IP pools require manual expansion. Each Cisco Azure Stack Hub server requires two Cisco IMC IPs:
  - Out-of-Band Management IP
  - Inband Management IP

Extending Management IP Pools

You can have one IP pool for each type of Cisco IMC IP. Cisco IMC IP pools should already exist on all Cisco Azure Stack Hub appliances.

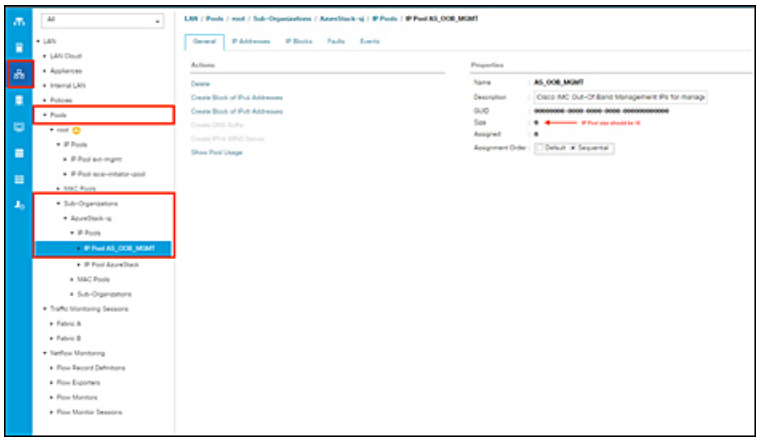
To extend the Out-of-Band management IP pool, review the Out-of-Band management IP subnet provided on the Cisco deployment worksheet addendum and find unused IP blocks in that subnet. It is recommended to make the total pool size 16 IPs.

From Cisco UCS Manager, navigate to **LAN** > **Pools** > **Sub-Organizations** > ***AzureStack Org*** > **IP Pools**. Locate the Out-of-Band management IP pool and ensure that the pool size is 16.

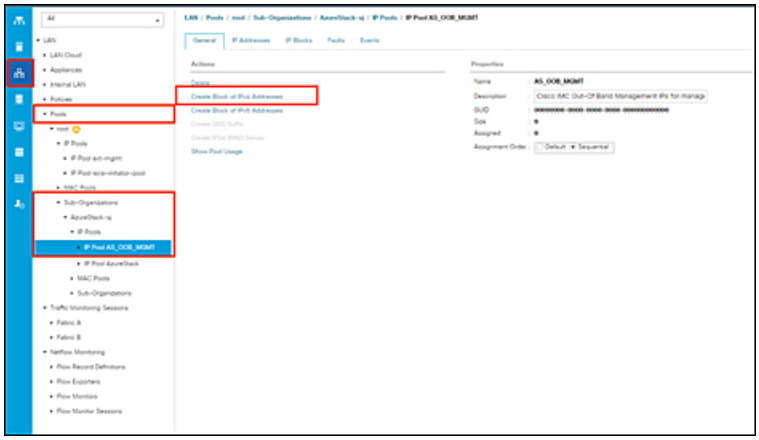
Procedure

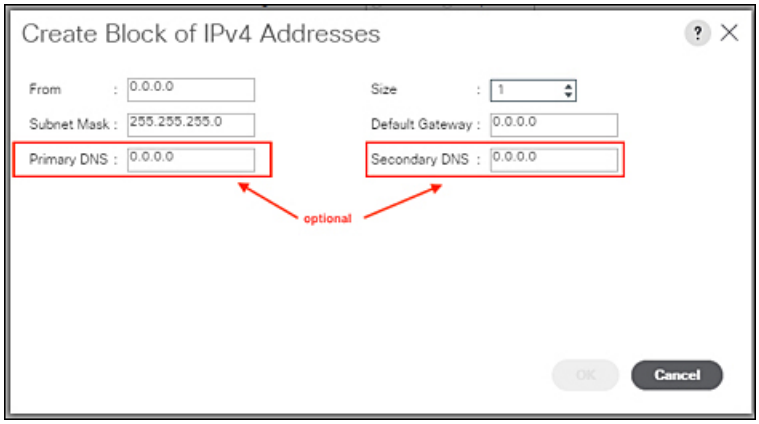
Step 1 From Cisco UCS Manager, navigate to **LAN** > **Pools** > **Sub-Organizations** > ***AzureStack Org*** > **IP Pools**.

Step 2 Locate the Out-of-Band management IP pool and ensure that the pool size is 16.



Step 3 If the pool size is not 16, add more IP addresses using the **Create Block of IPv4 Addresses** option in the UI. Add enough IP addresses to make the pool size 16. Leave the DNS values at the default “0.0.0.0”.

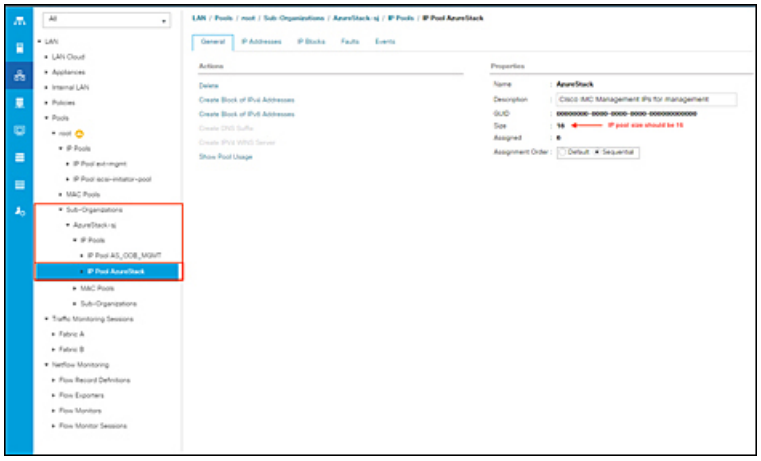




Step 4 Repeat these steps to extend the Inband management IP pool.

To determine the Inband management IPs for the pool expansion review the deployment worksheet completed before the deployment. It includes the BMC IP addresses for each server in the IP usage section. If the IP addresses for all 16 servers are not listed on the worksheet, select the next consecutive unused IP addresses after the last used BMC IP to extend the pool. For example, if you have a 4-node system and currently you

have a fully-consumed IP pool of 4 IP addresses 192.168.26.3 – 192.168.26.6, use IP addresses 192.168.26.7 – 192.168.26.18 to expand the Inband IP pool.



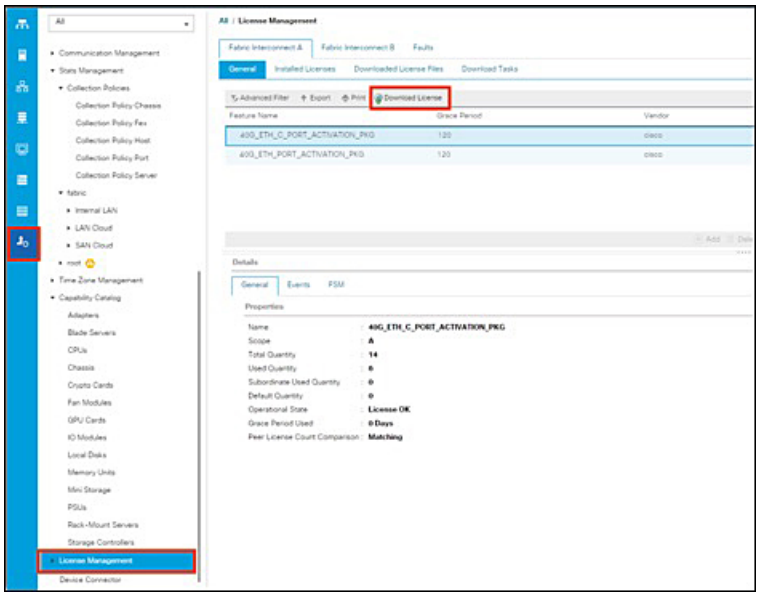
Adding a Scale Unit Node

Before you begin

Complete the list of prerequisites listed in Add Scale Unit Nodes.

Procedure

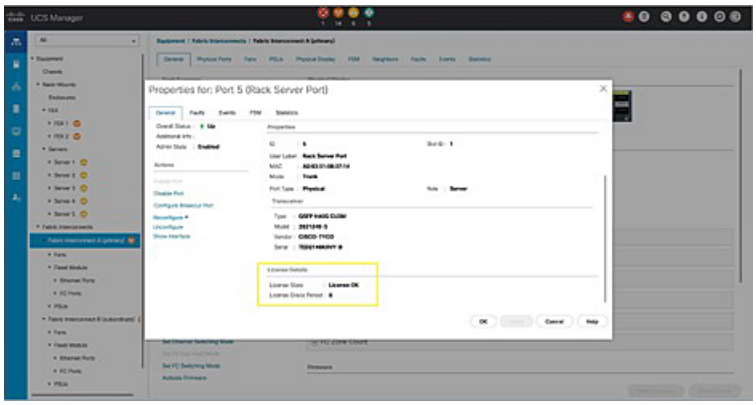
Step 1 Login to Cisco UCS Manager and navigate to **Admin** > **License Management** > **Fabric Interconnect A** > **General** tab.



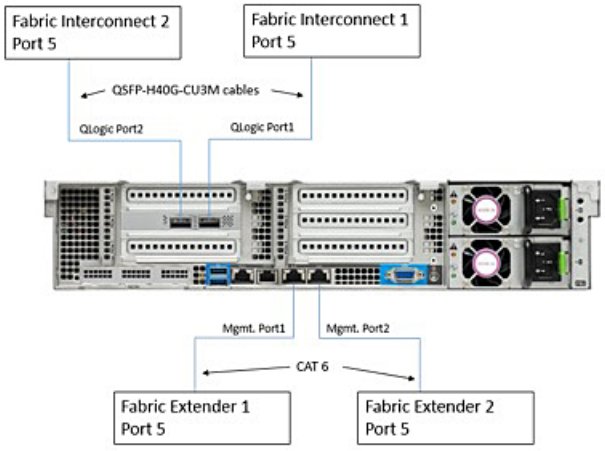
Step 2 Click **Download License** and install the UCS port license on Fabric Interconnect A.

Step 3 Repeat Steps 1 and 2 for Fabric Interconnect B.

After installing the license on each Fabric Interconnect, check the license status for the newly added server port by verifying the port properties.



Step 4 Install the server into the existing Azure Stack Hub rack, but do not connect the power. Refer to the Cisco Azure Stack Hub cabling guide for additional information on server placement and cabling. Connect the QLogic and management ports to the Fabric Interconnect and Fabric Extender. The new server will take up the next consecutive ports on the Fabric Interconnects and Fabric Extenders. For example, if you are installing the fifth server on the 4-node Azure Stack Hub system, the cabling for the server will look like this:



Step 5 Connect the power and wait for the UCS server discovery to finish.

During the discovery phase, Cisco UCS Manager automatically performs the following actions:

a. Inventories the server and server components

b. Adds the server to the appropriate server pool

c. Creates a new service profile for the server

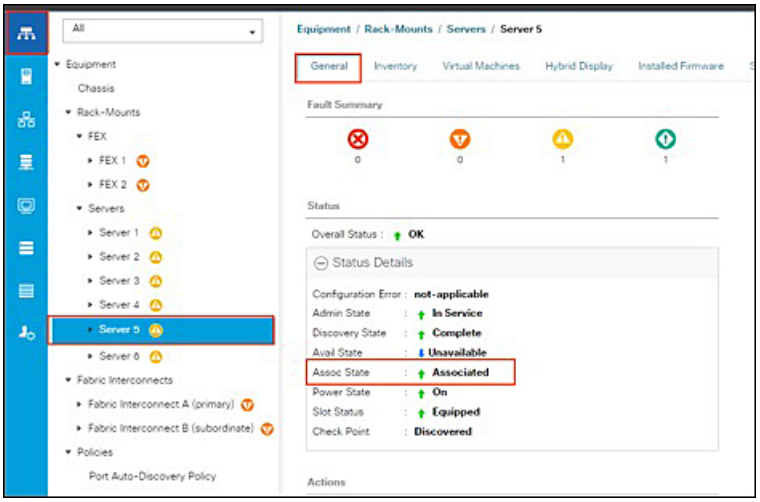
d. Associates the service profile to the server

e. During service profile association, upgrades server firmware to match other servers in the stamp

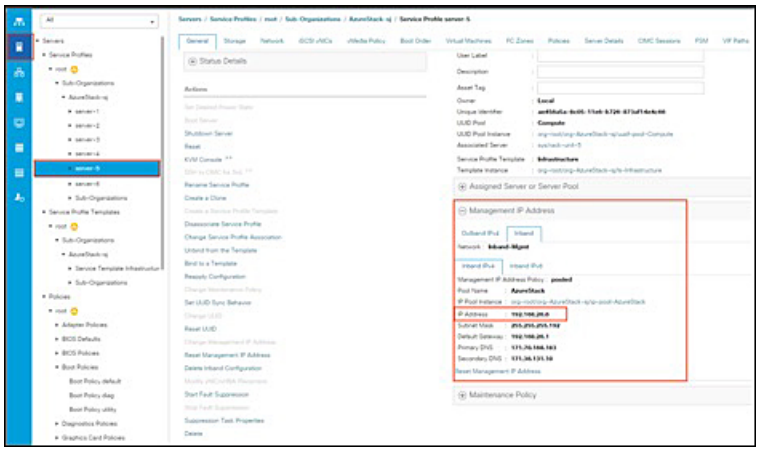
Server discovery can take anywhere from 40 minutes to 2 hours, depending upon the number of server components that require firmware upgrade.

Step 6 After discovery is complete, verify the Association state under **Equipment** > **Rack-Mounts** > **Servers** > ***Server <newly added server number>*** > **General**

The **Assoc State** should be **Associated**.

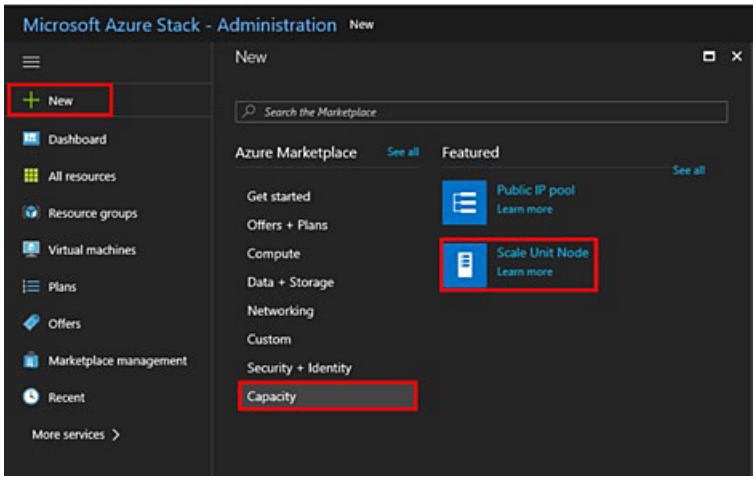


Step 7 From the **Server** tab in the navigation pane, select the service profile associated with the newly installed server and note the Inband management IP address.



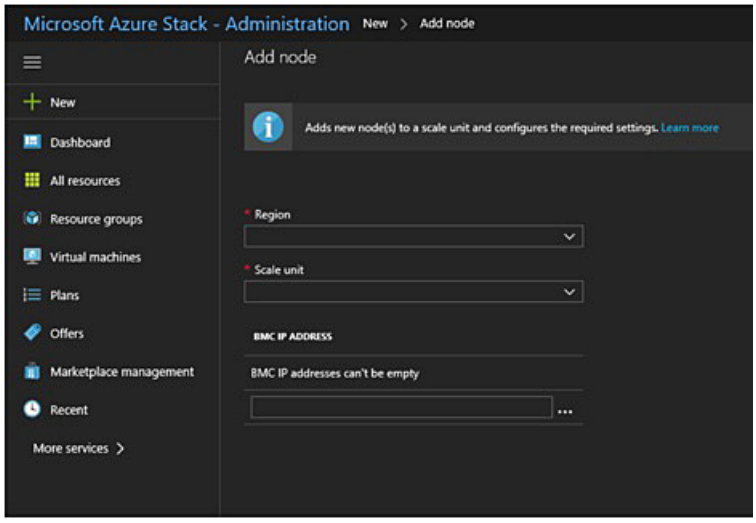
Step 8 Login to the Azure Stack Hub admin portal as an Azure Stack Hub operator.

Step 9 Navigate to **New** > **Capacity** > **Scale Unit Node**



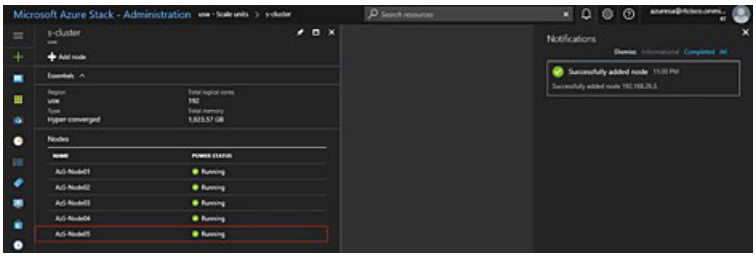
Step 10 On the **Add Node** pane, select the **Region** and then select the **Scale Unit** that you want to add the node to. Also, specify the BMC IP Address (InBand management IP address noted in Step 7) for the scale unit node that you are adding.

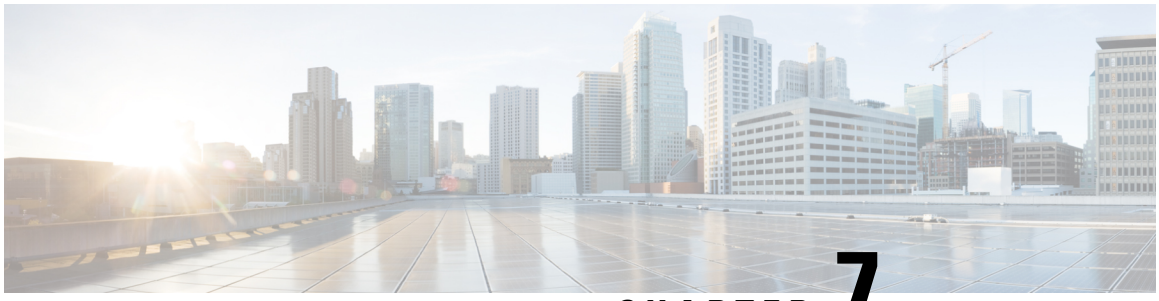
Note You can only add one node at a time.



Step 11 You can also add a node using PowerShell. Refer to the Microsoft Add node documentation for additional details.

Note During node addition, the scale unit will show status as **Expanding**, and this scale unit expansion takes a very long time. A new node can be added to the cluster as long as the last added node shows status as **Running** and it is not required to wait for cluster expansion to finish.





CHAPTER 7

Configuring Cisco Intersight Monitoring

Cisco Intersight Overview

Cisco Intersight™ is a software-as-a-service (SaaS) infrastructure lifecycle management platform that delivers simplified monitoring and support of Cisco Unified Computing System™ (Cisco UCS®). Cisco Intersight can be used for monitoring the UCS components that are part of the Cisco Integrated System for Azure Stack Hub.

The following features are part of Cisco Intersight Base License and can be used with Cisco UCS components:

- Global Monitoring of Health and Basic Inventory Status
- Integration with Cisco Technical Assistance Center (TAC) and Proactive TAC Support
- Proactive Support enabled through Intersight
- User Customizable Dashboard
- Custom Metrics Widgets
- Alarms
- Search and Tagging
- Launch Virtual KVM

For more information about Cisco Intersight, see Getting Started

Network Requirements for using Cisco Intersight

All device connectors must properly resolve svc.intersight.com and allow outbound initiated HTTPS connections on port 443. To resolve svc.intersight.com, you must configure DNS on the managed targets. If a proxy is required for an HTTPS connection to svc.intersight.com, the proxy can be configured in the Device Connector user interface.

For more information, see Intersight FAQ.

Creating an Intersight Account

You must have a Cisco Intersight account to configure Intersight Monitoring for Azure Stack Hub UCS Platform.

To create a Cisco Intersight account, do the following:

Procedure

Step 1 Log in to https://intersight.com/.

You must have a valid Cisco ID to create a Cisco Intersight account. If you do not have a Cisco ID, create one here.

Step 2 Click **Create an Account**, accept the Cisco End User License Agreement, and enter the account name in the **Account Creation** dialog box.

Step 3 Click **Create**.

You can create multiple accounts using the same Cisco ID. Click **Create an Account** on https://intersight.com/ and follow the step 2 to create another Intersight account.

After creating an Intersight account, you can begin claiming targets to manage your endpoints.

Obtaining Device ID and Claim Code

To obtain the Domain Device ID and Claim Code, do the following:

Procedure

Step 1 Log in to **Cisco UCS Manager** in a web browser.

Step 2 In the Navigation pane, click **Admin**.

Step 3 Expand **Communication Management** category and select **DNS Management**.

Verify the DNS server entries. If there are no DNS server entries, add minimum one DNS server IP address.

Step 4 In the Navigation pane, expand **All** and select **Device Connector**.

The **Device Connector** tab displays the device ID, claim code, connection status and the set access mode.

If the Device Connector does not show green dots to the Internet icon even with DNS entries, click **Retry Connection** to re-establish the Internet connection. Once the connection is established, the device ID and claim code will be displayed.

Claiming a UCSM Managed Domain

To initiate the Cisco UCS Domain (UCSM Managed) target claim, do the following:

Procedure

Step 1 In Cisco Intersight, navigate to **ADMIN** > **Targets** > **Claim Target**.

The **Select Target Type** window is displayed.

Step 2 In the filter column, select **Compute / Fabric** and select **Cisco UCS Domain (UCSM Managed)**, and then click **Start**.

Note Do not select the **Cisco UCS Domain (Intersight Managed)** target.

Step 3 Enter the **Device ID** and **Claim Code** obtained from Cisco UCS Manager. For more information, see Obtaining Device ID and Claim Code, on page 36.

Step 4 Click **Claim**.
The Cisco UCS Domain (UCSM Managed) instance will be added to the Intersight Managed devices.

Creating and Associating an Organization with Cisco UCS Manager Instance

The organization represents the Cisco UCS Manager instance to which it belongs to. When a Cisco UCS Manager instance is claimed in Cisco Intersight, you can assign the Cisco UCS Manager instance to an organization different from the default organization.

To create and associate a claimed Cisco UCS Manager instance to an organization, do the following:

Procedure

Step 1 Log in to **Cisco Intersight**.

Step 2 Click the gear icon in the upper right of the home screen and choose **Settings** from the drop-down list.

Step 3 In the **Account Details** screen, click the **Organizations** in the middle pane and perform the following:

a) Click **Create Organization**.

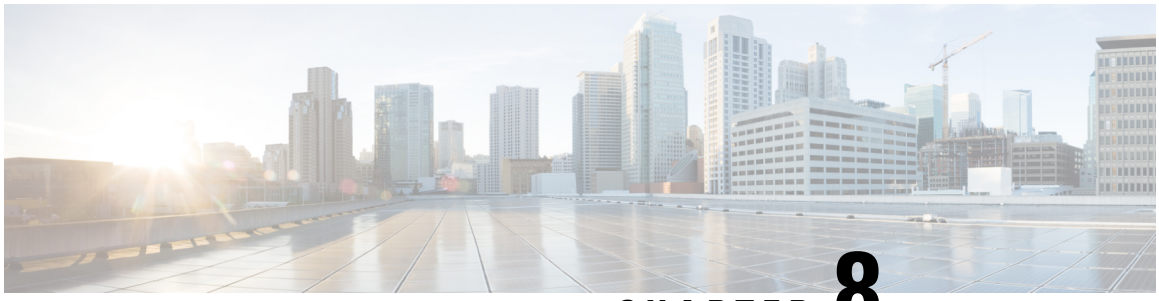
b) Enter the name of the organization. For example, Azure-Stack-Hub.

c) Enter the description of the organization.
d) Select the claimed Cisco UCSM Managed Domain.
e) Click **Create** to create and associate the Cisco UCSM Managed Domain with the new organization. Click Fabric Interconnects in the right pane to view the claimed Fabric Interconnects and its status.

Customize Dashboard Widgets

Cisco Intersight provides dashboard for real-time health and inventory status monitoring. You can create, customize, rename, and manage multiple dashboard views by adding, removing, or rearranging widgets. In the Widget Library, you can select the widget(s) that you want to pin to the dashboard, preview the details for a server or a cluster, search for a widget, and add a custom title to a widget. You can toggle between the detail and list view of the available widgets in the library. You can add multiple instances of a widget to monitor different targets. You can add a maximum of 30 widgets per dashboard.

- Use **Add Widget** button on the top right of the dashboard to add a widget.
- Hover the cursor on the widget, click **X** that appears on the top right corner of the widget to remove the widget.



CHAPTER 8

Replace Hardware

Replace Hardware

Use the following link and follow Microsoft instructions for replacement of faulty components:

https://docs.microsoft.com/en-us/azure-stack/operator/azure-stack-replace-component?view=azs-1908

The only customer-replaceable component of the Cisco Azure Stack Hub is the front and rear loading SAS disk drive. For all other component failures, contact Cisco Support.

Replace Disk

Disk failure alert on the Azure Stack Hub admin portal provides the server slot information and serial number of the faulty disk.

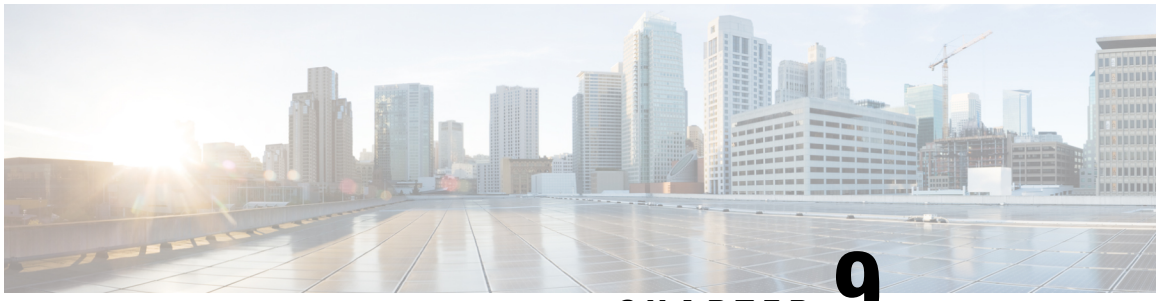
Procedure

Step 1 Locate and remove the faulty disk from the server.

Step 2 Order the replacement disk using serial number of the faulty disk.

Use the following portal to order the replacement disk: https://mycase.cloudapps.cisco.com/case. Alternatively, you can also contact Cisco Support.

Step 3 After the replacement disk is received, install the replacement disk in the server and follow Microsoft instructions to activate the disk.



CHAPTER 9

Manage System

Call Home in UCS Overview

Call Home provides an email-based notification for critical system policies. A range of message formats are available for compatibility with pager services or XML-based automated parsing applications. You can use this feature to page a network support engineer, email a Network Operations Center, or use Cisco Smart Call Home services to generate a case with the Technical Assistance Center.

Important Call Home does not use a secure protocol. It is disabled by default.

The Call Home feature can deliver alert messages containing information about diagnostics and environmental faults and events.

The Call Home feature can deliver alerts to multiple recipients, referred to as Call Home destination profiles. Each profile includes configurable message formats and content categories. A predefined destination profile is provided for sending alerts to the Cisco TAC, but you also can define your own destination profiles.

When you configure Call Home to send messages, Cisco UCS Manager executes the appropriate CLI **show** command and attaches the command output to the message.

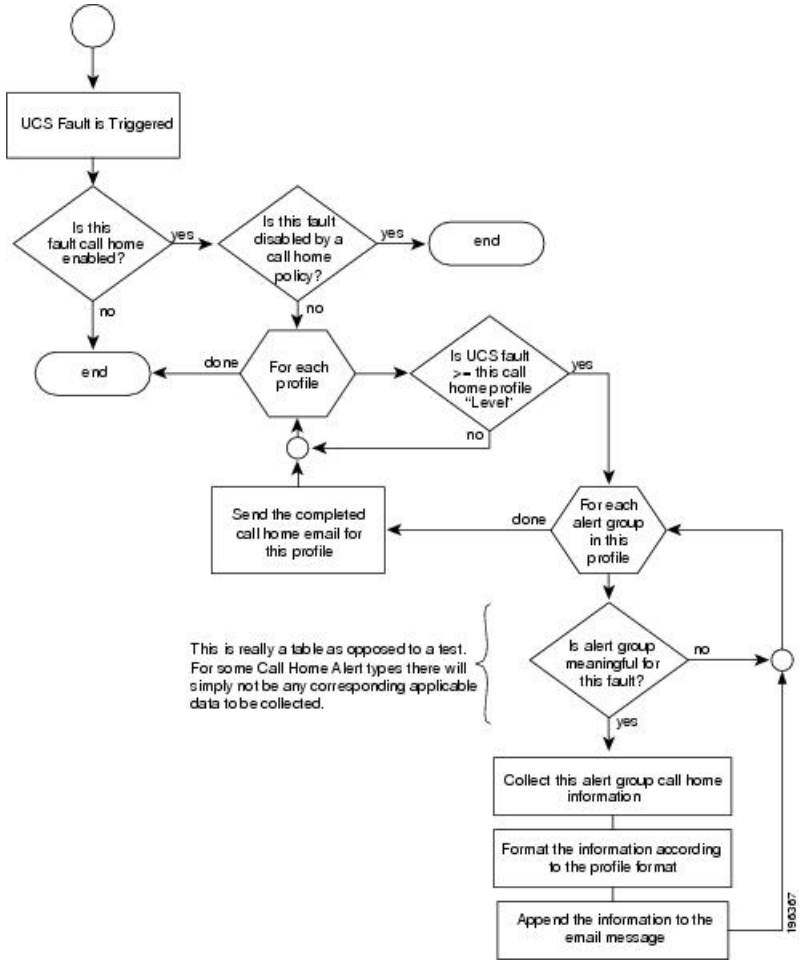
Cisco UCS delivers Call Home messages in the following formats:

- Short text format which provides a one or two line description of the fault that is suitable for pagers or printed reports.
- Full text format which provides fully formatted message with detailed information that is suitable for human reading.
- XML machine-readable format that uses Extensible Markup Language (XML) and Adaptive Messaging Language (AML) XML Schema Definition (XSD). The AML XSD is published on the Cisco.com website. The XML format enables communication with the Cisco Systems Technical Assistance Center.

For information about the faults that can trigger Call Home email alerts, see the *Cisco UCS Faults and Error Messages Reference*.

The following figure shows the flow of events after a Cisco UCS fault is triggered in a system with Call Home configured:

Figure 1: Flow of Events after a Fault is Triggered



Important Call Home is configured as **Off** by default. It is a non-secure feature, and must be explicitly enabled.

Call Home Considerations and Guidelines

How you configure Call Home depends on how you intend to use the feature. The information you need to consider before you configure Call Home includes the following:

Destination Profile

You must configure at least one destination profile. The destination profile or profiles that you use depends upon whether the receiving entity is a pager, email, or automated service such as Cisco Smart Call Home.

If the destination profile uses email message delivery, you must specify a Simple Mail Transfer Protocol (SMTP) server when you configure Call Home.

Contact Information

The contact email, phone, and street address information should be configured so that the receiver can determine the origin of messages received from the Cisco UCS domain.

Cisco Smart Call Home sends the registration email to this email address after you send a system inventory to begin the registration process.

If an email address includes special characters, such as # (hash), spaces, or & (ampersand), the email server might not be able to deliver email messages to that address. Cisco recommends that you use email addresses which comply with RFC2821 and RFC2822 and include only 7bit ASCII characters.

IP Connectivity to Email Server or HTTP Server

The fabric interconnect must have IP connectivity to an email server or the destination HTTP server. In a cluster configuration, both fabric interconnects must have IP connectivity. This connectivity ensures that the current, active fabric interconnect can send Call Home email messages. The source of these email messages is always the IP address of a fabric interconnect. The virtual IP address assigned to Cisco UCS Manager in a cluster configuration is never the source of the email.

Smart Call Home

If Cisco Smart Call Home is used, the following are required:

- An active service contract must cover the device being configured.
- The customer ID associated with the Smart Call Home configuration in Cisco UCS must be the CCO (Cisco.com) account name associated with a support contract that includes Smart Call Home.

Cisco UCS Faults and Call Home Severity Levels

Because Call Home is present across several Cisco product lines, Call Home has its own standardized severity levels. The following table describes how the underlying Cisco UCS fault levels map to the Call Home severity levels. You need to understand this mapping when you configure the Level setting for Call Home profiles.

Table 1: Mapping of Faults and Call Home Severity Levels

Call Home Severity	Cisco UCS Fault	Call Home Meaning
(9) Catastrophic	N/A	Network-wide catastrophic failure.
(8) Disaster	N/A	Significant network impact.
(7) Fatal	N/A	System is unusable.
(6) Critical	Critical	Critical conditions, immediate attention needed.
(5) Major	Major	Major conditions.
(4) Minor	Minor	Minor conditions.

Call Home Severity	Cisco UCS Fault	Call Home Meaning
(3) Warning	Warning	Warning conditions.
(2) Notification	Info	Basic notifications and informational messages. Possibly independently insignificant.
(1) Normal	Clear	Normal event, signifying a return to normal state.
(0) debug	N/A	Debugging messages.

Configuring Call Home

Procedure

Step 1 In the **Navigation** pane, click **Admin**.

Step 2 Expand **All** > **Communication Management** > **Call Home**.

Step 3 In the **Work** pane, click the **General** tab.

Step 4 In the **Admin** area, complete the following fields to enable Call Home:

Important Call Home is configured as **Off** by default. It is a non-secure feature, and must be explicitly enabled.

Name	Description
State field	This can be one of the following: • **Off**—Call Home is not used for this Cisco UCS domain. • **On**—Cisco UCS generates Call Home alerts based on the Call Home policies and profiles defined in the system. **Note** If this field is set to **On**, Cisco UCS Manager GUI displays the rest of the fields on this tab.

Name	Description
Switch Priority drop-down list	This can be one of the following: • **Alerts** • **Critical** • **Debugging** • **Emergencies** • **Errors** • **Information** • **Notifications** • **Warnings**
Throttling field	Indicates whether the system limits the number of duplicate messages received for the same event. This can be one of the following: • **On**—If the number of duplicate messages sent exceeds 30 messages within a 2-hour timeframe, then the system discards further messages for that alert type. • **Off**—The system sends all duplicate messages, regardless of how many are encountered.

a) In the **State** field, click **On**.

Note If this field is set to **On**, Cisco UCS Manager GUI displays the rest of the fields on this tab.

b) From the **Switch Priority** drop-down list, select one of the following levels:

- **Alerts**
- **Critical**
- **Debugging**
- **Emergencies**
- **Errors**
- **Information**
- **Notifications**
- **Warnings**

For a large Cisco UCS deployment with several pairs of fabric interconnects, this field enables you to attach significance to messages from one particular Cisco UCS domain, so that message recipients can gauge the priority of the message. This field may not be as useful for a small Cisco UCS deployment, such as a single Cisco UCS domain.

Step 5 In the **Contact Information** area, complete the following fields with the required contact information:

Name	Description
Contact field	The main Call Home contact person. Enter up to 255 ASCII characters.
Phone field	The telephone number for the main contact. Enter the number in international format, starting with a + (plus sign) and a country code. You can use hyphens but not parentheses.
Email field	The email address for the main contact. Cisco Smart Call Home sends the registration email to this email address. **Note** If an email address includes special characters, such as # (hash), spaces, or & (ampersand), the email server might not be able to deliver email messages to that address. Cisco recommends that you use email addresses which comply with RFC2821 and RFC2822 and include only 7bit ASCII characters.
Address field	The mailing address for the main contact. Enter up to 255 ASCII characters.

Step 6 In the **Ids** area, complete the following fields with the identification information that Call Home should use:

Tip If you are not configuring Smart Call Home, this step is optional.

Name	Description
Customer Id field	The Cisco.com ID that includes the contract numbers for the support contract in its entitlements. Enter up to 510 ASCII characters.
Contract Id field	The Call Home contract number for the customer. Enter up to 510 ASCII characters.
Site Id field	The unique Call Home identification number for the customer site. Enter up to 510 ASCII characters.

Step 7 In the **Email Addresses** area, complete the following fields with email information for Call Home alert messages:

Name	Description
From field	The email address that should appear in the **From** field on Call Home alert messages sent by the system.
Reply To field	The return email address that should appear in the **To** field on Call Home alert messages sent by the system.

Step 8 In the **SMTP Server** area, complete the following fields with information about the SMTP server where Call Home should send email messages:

Name	Description
Host (IP Address or Hostname) field	The IPv4 or IPv6 address, or the hostname of the SMTP server. **Note** If you use a hostname rather than an IPv4 or IPv6 address, you must configure a DNS server. If the Cisco UCS domain is not registered with Cisco UCS Central or DNS management is set to **local**, configure a DNS server in Cisco UCS Manager. If the Cisco UCS domain is registered with Cisco UCS Central and DNS management is set to **global**, configure a DNS server in Cisco UCS Central.
Port field	The port number the system should use to talk to the SMTP server. Enter an integer between 1 and 65535. The default is 25.

Step 9 Click **Save Changes**.

Enabling Call Home

This step is optional. You only need to enable Call Home if you disabled it before you began the firmware upgrades.

Procedure

Step 1 In the **Navigation** pane, click **Admin**.

Step 2 Expand **All** > **Communication Management** > **Call Home**.

Step 3 In the **Work** pane, click the **General** tab.

Step 4 In the **Admin** area, click **On** in the **State** field.

Note If this field is set to **On**, Cisco UCS Manager GUI displays the rest of the fields on this tab.

Step 5 Click **Save Changes**.

Disabling Call Home

This step is optional.

When you upgrade a Cisco UCS domain, Cisco UCS Manager restarts the components to complete the upgrade process. This restart causes events that are identical to service disruptions and component failures that trigger Call Home alerts to be sent. If you do not disable Call Home before you begin the upgrade, you can ignore the alerts generated by the upgrade-related component restarts.

Procedure

Step 1 In the **Navigation** pane, click **Admin**.

Step 2 Expand **All** > **Communication Management** > **Call Home**.

Step 3 In the **Work** pane, click the **General** tab.

Step 4 In the **Admin** area, click **Off** in the **State** field.

Note If this field is set to **Off**, Cisco UCS Manager hides the rest of the fields on this tab.

Step 5 Click **Save Changes**.