# Cisco Catalyst Center Global Manager Deployment Guide, Release 1.4.1

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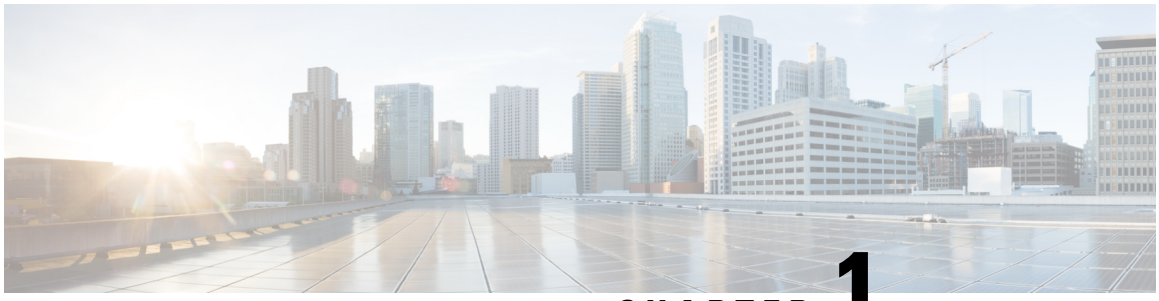


CHAPTER 1

# Catalyst Center Global Manager Overview



## Cisco Catalyst Center Global Manager

Catalyst Center Global Manager is a platform that provides you with a single pane of glass (SPoG) interface to easily manage multiple Catalyst Centers. Catalyst Center Global Manager integrates information from various Catalyst Center platforms into a single display.

For example, you may have multiple Catalyst Centers deployed across your enterprise, each dedicated to a specific region. Rather than logging into each Catalyst Center individually, you can link the Catalyst Centers to a single Catalyst Center Global Manager, allowing you to monitor all operations from one centralized location.

Catalyst Center Global Manager provides an overview of network status changes, including alerts and visibility into well-performing sites, as well as poor-performing sites. You can view and monitor summaries reported by any connected Catalyst Center, covering:

- Routing
- Switching
- Wireless
- Endpoints
- Software-Defined Access

Catalyst Center Global Manager supports up to 25 controllers and a maximum of 20 active users. Once these controllers are registered with Catalyst Center Global Manager, they will continue to monitor and control networks.

**Note** The minimum supported versions of the Catalyst Center are:

- 2.3.7.9
- 2.3.7.10
- 2.3.7.11
- 3.1.3
- 3.1.5
- 3.1.6

Single-node and three-node clusters, supported Catalyst physical appliance, virtual appliances (VA) on VMware ESXi, Amazon Web Services (AWS), and Azure can be integrated in to Catalyst Center Global Manager.

Catalyst Center Global Manager has a global search feature that lets you search for devices or clients by many attributes such as IP address, hostname, MAC address, software version, client user name, application name, or site name. You can cross-launch into the 360 view of the client or device in Catalyst Center. You can also cross launch into the Catalyst Center interfaces without entering your username and password again, if the same user exists in both the systems. Your passwords can be different.

Key features of Catalyst Center Global Manager are:

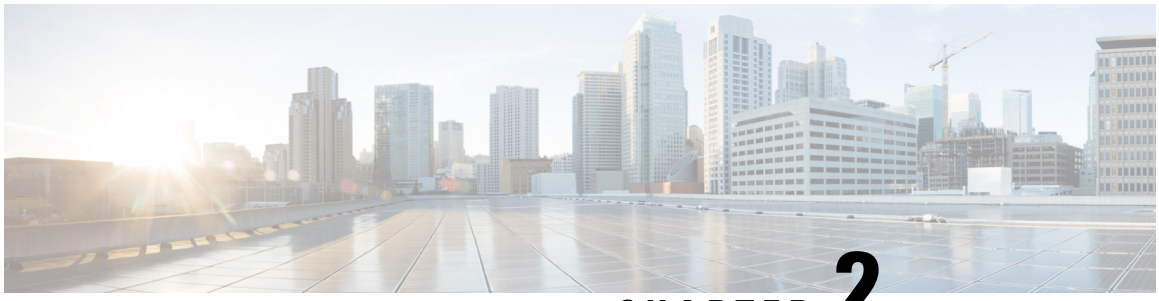
- **Scale and Enterprise Readiness**: Ensures the system is capable of handling large-scale operations and meets the robust operational requirements of enterprise environments.
- **System Health and Monitoring**: Provides tools and capabilities to continuously observe and assess the operational status and performance of Catalyst Center Global Manager and the underlying Catalyst Center control plane.
- **SSO Cross-Controller Navigation**: Enables you to seamlessly navigate between different controllers and Catalyst Center Global Manager with a single sign-on authentication.
- **Global Search**: Allows you to quickly find information or resources across the entire system from a centralized search bar.
- **Dashboard Customization**: Lets you personalize dashboard views and display relevant information and metrics based on your preferences.
- **UI Error Handling Improvements**: Enhances the user interface to better manage and communicate errors, improving the overall user experience.
- **Role-Based Access Control (RBAC)**: Implements security measures that restrict system access based on each user’s organizational role.
- **Day 0 Setup Improvements**: Streamlines and improves the initial configuration and deployment process for new installations.
- **Control Plane and System Visualization**: Displays a graphical representation of the system's control plane, providing insights into its architecture and operational status.
- **Site Hierarchy Unification**: Integrates and standardizes the organizational structure of different sites, creating a unified and consistent view.

- **Network Summary**: Presents an overview of the network status, performance, and key metrics.
- **Endpoint Visibility**: Offers comprehensive insight into all connected endpoints for improved monitoring and management.
- **EoL Visibility**: This feature is in beta. It shows clear information about the End-of-Life (EoL) and End-of-Sale (EoS) status of hardware and software components.
- **SDA Visibility**: Provides monitoring and insights for Software-Defined Access (SDA) deployments.
- **Inventory**: Lists all assets and resources managed on the network.
- **Device Infrastructure Health Devices Export** : Lets you export all matching results based on the filter selected. Data table export is only available for device **Health** under **Device Infrastructure**.
- **Drill-Down for Sites, Clients, Devices, and Issues**: Enables you to navigate from a high-level overview to detailed information about specific sites, clients, devices, or issues.
- **Improved Cross-Launch**: Enhances the functionality and user experience of launching cross-system applications and tools.
- **Controller backup**: Offers a centralized and aggregate view of your environment. It allows you to monitor backup status, schedule single or bulk backups for the selected controllers, configure backup settings, and troubleshoot backup failures through cross-launch to the controller.
- **Situational Dashboard**: Offers dashboard-building tools to design to customized, real-time, context-specific views into operational telemetry.
- **Complete UI/API parity**: Ensures that all functionalities available through the user interface are also accessible and controllable via the Application Programming Interface (API), providing consistent capabilities across both interfaces.

# Audience

This guide is designed for:

- System administrators: to deploy the Catalyst Center Global Manager virtual appliance, connecting controllers, and provisioning access for other users to allow additional configurations.
- Network administrators: to monitor aggregated network details and controller health via a Single Pane of Glass (SPOG).
- Users or operators: to manage or operate enterprise-scale network infrastructure.



CHAPTER 2

# Deployment Requirements



## Required firewall ports and connectivity

- **Firewall Access**: Allow outbound access to ciscoconnectdna.com.
- **Connectivity**: Ensure connectivity exists between the Catalyst Center Global Manager and the controllers. Catalyst Center Global Manager supports only one interface for the enterprise edition.
- **Supported Infrastructure**: includes:
  - Physical or virtual Catalyst Center appliances (single node or High Availability (HA) or Virtual Appliance (VA)).
  - VMware ESXi and vCenter, version 7.0.x or later
  - Network Time Protocol (NTP) needs to be synchronized between the Catalyst Center Global Manager and Catalyst Centers. Alternatively, ensure they maintain a maximum time difference of one second.
- **Ports required to be open on the firewall**: Open these ports on the firewall to enable communication with the HTTPS-enabled browsers and allow Catalyst Center Global Manager to interact with Catalyst Centers globally.

| Port | Service name | Purpose | Recommended action |
|---|---|---|---|
| Administering or configuring Catalyst Center Global Manager. | | | |
| TCP 443 | UI, REST, HTTPS | GUI, REST, HTTPS management port. | Open the port. |
| TCP 2222 | Catalyst Center Global Manager shell | Connect to the Catalyst Center Global Manager shell. | Keep the port open. Restrict the known IP address to be the source. |

| Port | Service name | Purpose | Recommended action |
|---|---|---|---|
| TCP 9004 | Web UI installation | Serves the GUI-based installation page. (This port is required only if you decide to install Catalyst Center Global Manager using the web-based option.) | Keep the port open until the node installation is complete. |
| Catalyst Center Global Manager outbound to Catalyst Center and other systems. | | | |
| TCP 49 | TACACS+ | Needed only if you are using external authentication such as Cisco ISE with a TACACS+ server. | Open the port only if you are using external authentication with a TACACS+ server. |
| UDP and TCP 53 | DNS | Used to resolve a DNS name to an IP address. | Open the port when you use DNS names instead of IP addresses for other services, such as an NTP DNS name. |
| UDP 123 | NTP | Catalyst Center Global Manager uses NTP to synchronize the time from the source that you specify. | Open the port for time synchronization. |
| TCP 443 | HTTPS | Catalyst Center Global Manager uses HTTPS for cloud-tethered upgrades, periodic polling from Catalyst Center and communication with HTTPS-enabled browsers. | Open the port. |
| UDP 1645 or 1812 | RADIUS | Needed only if you are using external authentication with a RADIUS server. | Open the port only if an external RADIUS server is used to authenticate user login to Catalyst Center. |
| 111 | NFS | Used for Assurance backups. | Open the port. |
| 2049 | NFS | Used for Assurance backups. | Open the port. |
| 20048 | NFS | Used for Assurance backups. | Open the port. |

| Port | Service name | Purpose | Recommended action |
|---|---|---|---|
| TCP and UDP 32767 | NFS | Used for Assurance backups. | Open the port. |

# Additional deployment requirements

Catalyst Center Global Manager is deployed as a virtual machine (VM) on VMware ESXi version 7.x or later.

You must meet these requirements listed here to deploy a Catalyst Center Global Manager virtual appliance. For performance tips on the most critical areas of VMware vSphere, refer to:

- VMware vSphere Client 7.0: *Performance Best Practices for VMware vSphere 7.0, Update 3* (PDF)
- VMware vSphere Client 8.0: *Performance Best Practices for VMware vSphere 8.0* (PDF)

### Virtual machine minimum requirements

| Requirement | Detail |
|---|---|
| Virtualization platform and hypervisor | VMware vSphere (which includes ESXi and vCenter Server) 7.0.x or later, including all updates. |
| Processors | Intel Xeon Scalable server processor (Cascade Lake or newer) or AMD EPYC Gen2 with 2.1 GHz or better clock speed.<br>Dedicate 8 vCPUs with a 16 GHz reservation to the VM. |
| Hard Disk Drive (HDD) | 100 GB + 550 GB (2 HDDs). |
| Memory | 16 GB RAM. |
| I/O Bandwidth | 180 MB/sec. |
| Input/output operations per second (IOPS) rate | 2000-2500, with less than 5 ms of I/O completion latency. |
| Latency | Catalyst Center Global Manager to Catalyst Center connectivity: 350 ms. |
| Active Sessions | The system supports up to 20 active user connections when network administrators log in to Catalyst Center Global Manager. |

### Server requirements

| Requirement | Detail |
|---|---|
| vCenter and ESXi | 7.0x+. |
| Intel CPU | 2.1 GHz and later. |

### Supported browsers

The Catalyst Center Global Manager GUI is compatible with these HTTPS-enabled browsers:

- Google Chrome: Version 134 or later
- Mozilla Firefox: Version 120.0.1 or later

**Screen resolution:**

- Minimum: 1368 x 768 pixels
- Recommended: 1920 x 1080 pixels

Ensure that the client systems used to log in to Catalyst Center Global Manager have 64-bit operating systems and browsers.

### Scale numbers

The table lists the number of controllers, users and sites that Catalyst Center Global Manager supports.

| Component | Maximum Number Supported |
|---|---|
| Controllers | 25 controllers<br>**Note**<br>3-node controllers are treated as a single controller within the 25-controller scale limit |
| Users | 20 active users |
| Sites | 25,000 (maximum aggregated sites)<br>• 100 (sites on multiple controllers)<br>• 5 (same site on maximum number of controllers) |

**Note** For more information on the Catalyst Center scale limit, refer to the Cisco Catalyst Center Data Sheet.

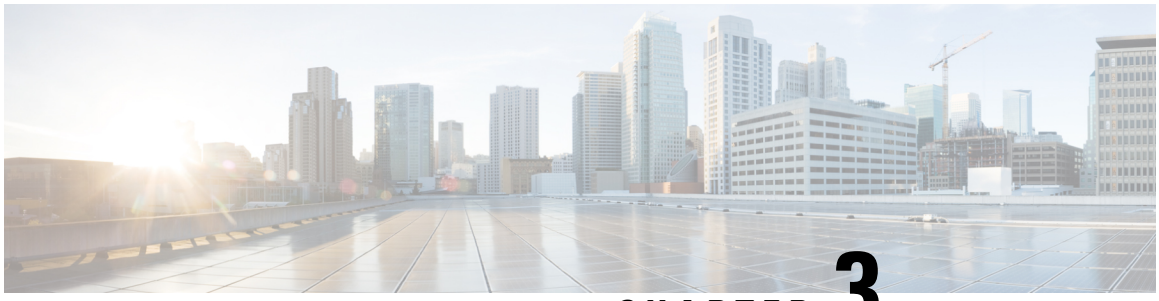
### Security limitations

Catalyst Center Global Manager does not support managing Catalyst Centers with:

- Disaster Recovery (DR)
- Federal Information Processing Standards (FIPS)
- IPv6 configurations-only setups
- Air-gapped configurations

### User access role requirements

- You have matching user accounts on both Catalyst Center Global Manager and Catalyst Center.
- You get the access permissions come from individual Catalyst Centers.



CHAPTER 3

# Prepare for Deployment



## Prepare for deployment

Catalyst Center Global Manager is deployed as a virtual machine (VM) on VMware ESXi version 7.x or later.

To prepare for the deployment of a Catalyst Center Global Manager on VMware ESXi virtual appliance, complete these tasks.

## Install VMware

VMware vSphere 7.0.x or later (which includes ESXi and vCenter Server), including all patches, is required to run Cisco Catalyst Center Global Manager on ESXi. Access an overview of the VMware vSphere installation and setup process using this link. After installing VMware vSphere, confirm that you can access it from the computer used to deploy the Open Virtual Appliance (OVA) file for the virtual appliance.

Use a web browser to access the vCenter 7.0.x to deploy the OVA for Catalyst Center Global Manager virtual appliance.

## Download the OVA for Catalyst Center Global Manager

Save the OVA files to the computer on which you will deploy Catalyst Center Global Manager. Download the .ova file from the Cisco-provided link to use it for deploying the Catalyst Center Global Manager. You can also host the OVA on a web server.

**Note** The size of the .ova file is approximately 23 GB, and the download time depends on network bandwidth.

# Reserve enterprise interface

Reserve one 10-Gbps enterprise interface to access the Catalyst Center Global Manager GUI before you configure the virtual appliance. Record the IP address for this interface, because you will need to enter it during appliance configuration.

**Note** During the installation process, you must also configure a secondary interface called the intracluster interface, assigning it a non-routable IP address. The standard installer uses a predefined IP address for this interface that cannot be changed. If you need to change this IP address due to network overlap, use the Advanced installer.

Cisco predefines the IP address for the intracluster interface. The Maglev Configuration wizard automatically populates this information during the configuration process.

# Import the IdenTrust certificate chain

The Catalyst Center Global Manager OVA file is signed with an IdenTrust CA certificate. This certificate is not included in the default VMware truststore. As a result, the **Deploy OVF Template** wizard's **Review details** page displays an invalid certificate message after you complete the wizard. To prevent this, import the IdenTrust certificate chain to the host or cluster where you plan to deploy the OVA file.

### Before you begin

- You must have a VMware ESXi host or cluster where the Catalyst Center Global Manager virtual appliance will be deployed.
- Confirm you have administrator access to the target vSphere host or cluster.
- Locate the download site for both the OVA file and the related IdenTrust CA certificate (**trustidevcodesigning5.pem**).

### Procedure

**Step 1** On the VMware Catalyst Center Global Manager host or cluster where your virtual appliance will reside, download and extract **trustidevcodesigning5.pem** from the same location specified for downloading the Catalyst Center Global Manager OVA file.

**Step 2** Unzip this file if it is compressed.

**Step 3** Log in to the vSphere Web Client managing the host or cluster.

**Step 4** Choose **Administration** > **Certificates** > **Certificate Management**.

**Step 5** In the **Trusted Root Certificates** field, click **Add**.

**Step 6** In the **Add Trusted Root** dialog box, click **Browse**.

**Step 7** Navigate to the location of the certificate chain you downloaded in Step 1 (**trustidevcodesigning5.pem**). Select the file, then click **Open**.

**Step 8** Check the **Start Root certificate push to vCenter Hosts** check box, then click **Add**.

You see a message confirming that the certificate chain was imported successfully.

After you complete the **Deploy OVF Template** wizard, the **Review details** page shows that you are using a trusted certificate in the **Publisher** field.

# Prepare the DNS, NTP, and proxy servers

In the Maglev Configuration wizard, you'll be prompted to specify two items:

- The Domain Name System (DNS) server is used by Catalyst Center Global Manager to convert domain names to IP addresses.
- The Network Time Protocol (NTP) server is used by Catalyst Center Global Manager for clock synchronization. Ensure that the NTP server is accessible to the Catalyst Centers, or confirm they maintain synchronization with a time deviation of less than 1 second.

Before you configure your Catalyst Center Global Manager, do these steps:

- Make sure the servers you want to use are available and running.
- For an NTP server, obtain its IP address or hostname.
- For a proxy server, obtain its URL, IP address, or hostname, as well as its login credentials.

# Enable storage input/output control

Complete the procedure for the datastore where you plan to deploy the appliance to prioritize the virtual appliance's input/output (I/O) over other virtual machines during network I/O congestion.

Enable Storage I/O Control in vSphere so the deployed virtual appliance receives preferred I/O resources during datastore congestion.

### Before you begin

- Make sure you have administrator access to the vSphere Client.
- Identify the target datastore for your virtual appliance deployment.

### Procedure

**Step 1** In the vSphere Client, navigate to and click the datastore in which you plan to deploy a virtual appliance.

**Step 2** Click the **Configure** tab, and then click **General**.

**Step 3** In the **Datastore Capabilities** area, click **Edit**.

**Step 4** In the **Configure Storage I/O Control** window, complete these steps:

a) Click the **Enable Storage I/O Control and statistics collection** radio button.

b) In the **Storage I/O congestion threshold** area, configure the congestion threshold you want to use.

You can either specify a peak throughput percentage or enter a value (in milliseconds).

c) (Optional) In the **Statistic Collection** area, check the **Include I/O statistics for SDRS** check box.

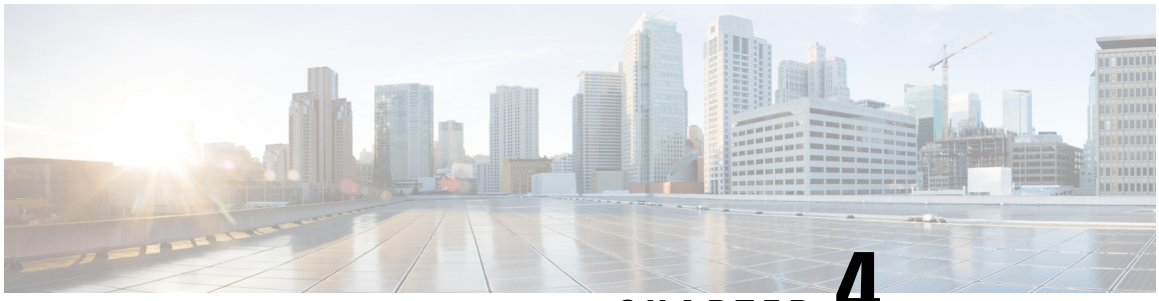
**Step 5** Click **OK**.

Storage I/O Control is enabled. The VM for the virtual appliance now receives prioritized I/O during datastore congestion.

# Check HA Admission Control Setting

You cannot create three-node clusters by connecting Catalyst Center Global Manager on ESXi. To enable high availability (HA), use the HA functionality in VMware vSphere. Enable strict admission control to ensure that:

- The system does not power on a virtual machine if that action would violate availability constraints.
- The system enforces configured failover capacity limits.
- HA operates as expected during a failover.



CHAPTER 4

# Deploy Catalyst Center Global Manager VM on VMware ESXi



## Deployment Modes of Catalyst Center Global Manager VM on VMware ESXi

This section describes the deployment modes and the steps to deploy Catalyst Center Global Manager VM on ESXi 7.0 or later.

Catalyst Center Global Manager can be deployed using one of these methods:

- Configuration wizard or command-line interface (CLI).
- Web install or graphical user interface (GUI).

Catalyst Center Global Manager deployment provides these capabilities:

- Deploy Catalyst Center Global Manager on a VM (VMware ESXi/vCenter).
- Install Catalyst Center Global Manager using CLI or web install.

## Create the Catalyst Center Global Manager VM

Use the **Deploy OVF Template** wizard in the VMware vSphere Web Client to deploy the OVF-formatted file.

Follow these steps to deploy your virtual machine on the VMware ESXi host or cluster where your virtual appliance will reside.

### Procedure

**Step 1** Download the Catalyst Center Global Manager OVA file from the location specified by Cisco.

**Step 2** Log in to the VMware vSphere Web Client using the applicable credentials.

The **VMware vSphere Web Client** page opens.

**Step 3** In the navigation pane, right-click the IP address of host or cluster on which you want to deploy the OVA file and then click **Deploy OVF Template**.

The **Deploy OVF Template** wizard opens.

**Step 4** Complete the **Deploy OVF Template** wizard:

a) In the **Select an OVF Template** wizard page, specify the OVA file you want to use for deployment and then click **Next**. You can either:

- Click the **URL** radio button and enter the appropriate path and OVA filename. If you choose this option, ensure that the OVA file is stored in and shared from a web-accessible location.
- Click the **Local file** radio button, click **Upload Files**, and then navigate to and select the appropriate OVA file.

The wizard's **Select a name and folder** page opens. By default, the filename field shows the OVA file name you are about to create. The path shows the location within the Navigator directory where the ESXi host or cluster is listed. This location corresponds to the deployment location you chose in Step 3.

b) If you want to use the default values, click **Next** and proceed to Step 4c.

Optionally, if you want to use different values such as naming the VM or selecting a different folder location in the VMware vSphere Web Client directory, complete these steps:

1. Enter a name for the virtual machine you are creating.
2. Specify where the virtual machine will reside.
3. Click **Next**.

The wizard's **Select a compute resource** page opens.

c) Click the ESXi host or cluster you selected for OVA deployment—this is the same one you right-clicked in Step 3. Then click **Next**.

The **Review details** page opens which lists deployment template details.

d) Review the template details and then do one of these steps:

- To make changes, click **Back** to return to the appropriate wizard page.
- To proceed, click **Next**.

The wizard's **Select storage** page appears.

e) On the **Select storage** page, complete these steps:

1. Click the radio button for the storage device you want to use.
2. In the **Select virtual disk format** field, choose either the **Thick Provision** or **Thin Provision** option.

**Note**
**Thick Provision** is recommended here.

3. In the **VM Storage Policy** drop-down list, keep the **Datastore Default**.
4. Click **Next**.

The wizard's **Select networks** page opens.

f) To assign the interface that Catalyst Center Global Manager will use, on the **Select networks** indicate the interface that connects the system to the enterprise network, complete these steps:

1. In the **VM Network** drop-down list, choose the interface that connects the system to the enterprise network.

   **Note**
   This interface or IP address is used for UI or SSH access to Catalyst Center Global Manager as well as establishing connection with controllers. So connectivity to and from the controllers must be ensured through this IP.

   Only one NIC is supported for Catalyst Center Global Manager VM.

2. Click **Next**.

The **Ready to complete** wizard page opens and displays a summary of the deployment settings you've entered.

g) Review the settings, then do one of these steps:

- If you need to make any changes, click **Back** as needed to return to the appropriate wizard page and make the changes.
- If the settings are correct and you want to proceed with deployment, click **Finish**.

  The **Deploy OVF Template** wizard closes and the deployment of the Catalyst Center Global Manager begins immediately.

  **Important**
  - Deployment typically takes about 45 minutes to complete. Monitor the deployment progress in the vSphere Client's **Recent Tasks** tab.
  - Available bandwidth, vCPUs, RAM, and hard disk space can affect the time that this process takes.
  - After the deployment tasks are completed, power on your virtual machine and configure it.

# Configure Catalyst Center Global Manager on ESXi virtual appliance

Before using Catalyst Center Global Manager, complete the appliance configuration workflow that meets your requirements. Complete one of the procedures below to configure Catalyst Center Global Manager on an ESXi virtual appliance on a VMware ESXi host.

# Configure a virtual appliance using the maglev configuration wizard (default mode)

To quickly configure a virtual appliance with preset appliance settings, use the maglev configuration wizard by completing this procedure.

**Note** The intracluster interface is preconfigured when using this wizard.

Configure the virtual appliance using these steps:

### Before you begin

Before you start, gather this information for the virtual appliance:

- Static IP address
- Subnet mask
- Default gateway
- DNS address
- NTP server details
- Proxy server details

### Procedure

**Step 1** After deployment completes, power on the newly-created virtual machine:

a) In the vSphere Client, right-click the virtual machine.

b) Choose **Power** > **Power On**.

The virtual machine becomes operational in about 45 minutes after you power it on. The actual time depends on available bandwidth, RAM, hard disk space, and the number of vCPUs. You can monitor progress in the VMware VM Console.

**Step 2** Launch either the remote console or web console by clicking the appropriate link.

**Step 3** Configure the virtual machine by completing the maglev configuration wizard:

a) You do not need to enter any settings on the **STATIC IP CONFIGURATION** page. Click **skip>>** to continue to the next screen for CLI based installed.

The **Welcome to Maglev Configuration Wizard** window opens. Select Catalyst Center Global Manager and then hit **Enter**.

b) Click **Create Catalyst Center Global Manager Virtual Appliance**.

c) Select the **Start using MKS pre manufactured cluster** option.

The pre-manufactured cluster option enables faster installation but prevents customization of the cluster port.

d) Select the manufacture cluster option. The wizard displays a series of questions about maglev configuration.

1. This is the enterprise address. Its purpose is to enable Catalyst Center Global Manager to communicate with and manage your network.
2. Click **Next** to proceed to the next screen. This is the cluster default IP address. No need to do any changes here.

e) Enter the configuration values for **NETWORK ADAPTER #1**, and click **next>>** to validate the host networking. See the table for required network settings.

| | |
|---|---|
| Host IP address | Enter the IP address for the Enterprise port. |
| Netmask | Enter the mask for your IP address. |
| Default Gateway IP Address | Enter the default gateway IP address to use for the port. |
| Static routes | If you enter a default gateway, do not configure static routes. |

The wizard validates the settings after the DNS step. If you receive an error message, check your entry and correct it. Click **<<back** to reenter if needed. The validation process takes approximately 4 to 5 minutes.

f) You do not need to enter configuration values for **NETWORK ADAPTER #2**. The **NETWORK ADAPTER #2** is the cluster port. If you selected **pre manufactured**, these values are prepopulated and cannot be changed. If you selected advance install, enter the desired cluster interface information. Select **next>>** to proceed.

g) In the **DNS Configuration** page, enter the IP address of the preferred DNS server and then select **next>>**. If you are entering multiple DNS servers, separate the IP addresses in the list with spaces.

**Important**
Configure a maximum of three DNS servers. Problems can occur if you configure more than three DNS servers for a virtual appliance.

h) Do one of these steps:

- If you need to change any settings, select **<<back** as needed, make the necessary changes, and then return to this wizard page.
- If you are satisfied with the settings you entered, select **proceed>>**.

i) After the network adapter configuration is complete, the wizard prompts you to enter configuration values for the NETWORK PROXY you are using.

After validation successfully completes, do one of these steps:

- If your network does *not* use a proxy server to access the Internet, select **skip proxy>>** to proceed.
- If your network uses a proxy server, enter the configuration values in the **NETWORK PROXY** wizard page by referring to this table, then select **next>>**.

| | |
|---|---|
| HTTPS Proxy field | Enter the URL or host name of an HTTPS network proxy used to access the Internet.<br>**Note**<br>Connection from Catalyst Center Global Manager to the HTTPS proxy is supported only through HTTP in this release. |
| HTTPS Proxy Username field | Enter the user name used to access the network proxy. If no proxy login is required, leave this field blank. |

| | |
|---|---|
| HTTPS Proxy Password field | Enter the password used to access the network proxy. If no proxy login is required, leave this field blank. |

j) (Optional) Enter the virtual appliance's virtual IP address in the **MAGLEV CLUSTER DETAILS** wizard page. Enter the virtual IP address configured for the Enterprise interface.

You can also specify the fully qualified domain name (FQDN) for your virtual appliance. Catalyst Center Global Manager uses this domain name to perform these functions:

- Catalyst Center Global Manager accesses your virtual appliance's web interface and the Representational State Transfer (REST) APIs used by devices in the enterprise network it manages with this hostname.

Select **next>>** to proceed after you provide the necessary information. Correct any validation errors as you did in earlier screens.

k) Enter the configuration values for the settings provided in the wizard's **USER ACCOUNT SETTINGS** page by referring to this table, then select **next>>**.

| | |
|---|---|
| Linux Password field | Enter and confirm the password for the `maglev` user.<br>**Note**<br>According to the CLI password policy, your new password must differ from the last 24 passwords you have used. |
| Re-enter Linux Password field | Confirm the Linux password by entering it a second time. |
| Password Generation Seed field | If you do not want to create the Linux password yourself, enter a seed phrase in this field and then press <**Generate Password**> to generate the password. |
| Auto Generated Password field | (Optional) The seed phrase appears as part of a random and secure password. If desired, you can either use this password "as is", or you can further edit this auto-generated password.<br>Press <**Use Generated Password**> to save the password. |

Correct any validation errors to proceed (if necessary).

l) Enter the configuration values for the settings provided in the wizard's **NTP SERVER SETTINGS** page by referring to this table, then select **next>>**.

| | |
|---|---|
| NTP Servers field | Enter one or more NTP server addresses or hostnames, separated by spaces. At least one NTP address or hostname is required. For a production deployment, we recommend that you configure a minimum of three NTP servers. The Catalyst Centers and the Catalyst Center Global Manager must use a common NTP server or be synchronized within a maximum time difference of one second.<br>**Note**<br>For NTP, ensure port 123 (UDP) is open between Catalyst Center Global Manager and your NTP server. |

| | |
|---|---|
| NTP Authentication check box | To enable the authentication of your NTP server before it's synchronized with Catalyst Center Global Manager, check this check box and then enter these information:<br>• The NTP server's key ID. Valid values range between 1 and 4294967295 (2^32-1).<br>This value corresponds to the key ID that's defined in the NTP server's key file.<br>• The SHA-1 key value associated with the NTP server's key ID. This 40-character hex string resides in the NTP server's key file.<br>**Note**<br>Ensure that you enter a key ID and key value for each NTP server that you configured in the previous field. |

After you provide the necessary information, correct any validation errors to proceed (if necessary).

A final message appears, stating that the wizard is ready to apply the configuration.

m) To apply the settings you've entered to the virtual appliance, select **proceed>>**.

After the configuration process completes, the virtual appliance powers on again and displays a **CONFIGURATION SUCCEEDED!** message. Then, it displays the maglev login page.

**Note** It can take from 15 to 30 minutes for services to stabilize, after which you can log in to the virtual appliance GUI.

# Configure a virtual appliance using the maglev configuration wizard (advanced mode)

To configure a virtual appliance using the maglev configuration wizard and to specify settings that are different from the preset appliance settings, follow this procedure.

### Before you begin

Before you start, gather this information for the virtual appliance:

- Static IP address
- Subnet mask
- Default gateway
- DNS address
- NTP server details
- Proxy server details

### Procedure

**Step 1** After deployment completes, power on the newly created virtual machine:

a) In the vSphere Client, right-click the virtual machine.

b) Choose **Power** > **Power On**.

The virtual machine becomes operational in about 45 minutes after you power it on. The actual time depends on available bandwidth, RAM, hard disk space, and the number of vCPUs. You can monitor the progress in the vSphere Client's **Recent Tasks** tab.

**Step 2** Click the link to open the remote console or web console.

**Step 3** Configure the virtual machine by completing the maglev configuration wizard:

a) You do not need to enter any settings in the **STATIC IP CONFIGURATION** page in the wizard, so select **skip>>**.

b) Click **Create Catalyst Center Global Manager Virtual appliance**.

c) Select the **Start configuration of MKS in advanced mode** option.

The next wizard page opens, indicating that all preconfigured appliance settings (except for the container and cluster subnets) will be erased. You'll need to enter values for these settings.

If you choose this option, you cannot return to the default appliance setup workflow. Review this limitation before you complete the next step.

d) Select **proceed>>**.

After all of the preconfigured appliance settings have been erased, the next wizard page opens.

e) Select **next>>**.

f) You don't need to enter any settings in the **Layer2 mode used for the services** wizard page, so select **next>>**.

g) Enter the configuration values for **NETWORK ADAPTER #1**, as shown in this table, then select **next>>**.

Catalyst Center Global Manager uses this interface to link the virtual appliance with your network.

| | |
|---|---|
| Host IPv4 Address field | Enter the IP address for the Enterprise interface. This is required. |
| IPv4 Netmask field | Enter the netmask for the interface's IP address. This is required. |
| Default Gateway IPv4 Address field | Enter a default gateway IP address to use for the interface. |
| IPv4 Static Routes field | Enter one or more static routes in this format, separated by spaces: *<network>/<netmask>/<gateway>*. |
| Cluster Link field | Leave this field blank. It is required on the Intracluster interface only. |
| LACP Mode field | Leave this field blank, it does not apply to virtual appliances. |

The wizard validates the values you entered and issues an error message if any are incorrect. If you receive an error message, verify the entered value and correct it. If needed, select **<<back** to make another change.

h) In the **DNS Configuration** page, enter the IP address of the preferred DNS server and then select **next>>**. If you are entering multiple DNS servers, separate the IP addresses in the list with spaces.

**Important**

Configure a maximum of three DNS servers. Problems can occur if you configure more than three DNS servers for a virtual appliance.

i) Do one of these steps:

- If you need to change any settings, select **<<back** as needed, make the necessary changes, and then return to this wizard page.
- If you are satisfied with the settings you entered, select **proceed>>**.

j) After the network adapter configuration is complete, the wizard prompts you to enter configuration values for the NETWORK PROXY you are using, as described in this table.

| | |
|---|---|
| HTTPS Proxy field | Enter the URL or host name of an HTTPS network proxy used to access the Internet.<br>**Note**<br>Connection from Catalyst Center Global Manager to the HTTPS proxy is supported only through HTTP in this release. |
| HTTPS Proxy Username field | Enter the user name used to access the network proxy. If no proxy login is required, leave this field blank. |
| HTTPS Proxy Password field | Enter the password used to access the network proxy. If no proxy login is required, leave this field blank. |

After validation successfully completes, do one of these steps:

- If your network does not use a proxy server to access the internet, select **skip proxy>>** to proceed.
- If your network uses a proxy server, enter the configuration values in the **NETWORK PROXY** wizard page (as shown in the above table), then select **next>>**.

k) (Optional) The wizard prompts you to enter the virtual IP address for the appliance in the **MAGLEV CLUSTER DETAILS** wizard page. Enter the virtual IP address configured for the Enterprise interface.

You can also specify the fully qualified domain name (FQDN) for your virtual appliance. Catalyst Center Global Manager uses this domain name to do this step:

- Catalyst Center Global Manager uses this hostname to access your virtual appliance's web interface and the Representational State Transfer (REST) APIs used by devices in the enterprise network that Catalyst Center Global Manager manages.

After you provide the necessary information, select **next>>** to proceed. Correct any validation errors if they occur.

l) Enter the configuration values for the settings provided in the **USER ACCOUNT SETTINGS** page in the wizard as described in this table. Then select **next>>**.

| | |
|---|---|
| Linux Password field | Enter and confirm the password for the `maglev` user.<br>**Note**<br>According to the CLI password policy, your new password must differ from the last 24 passwords you have used. |
| Re-enter Linux Password field | Confirm the Linux password by entering it a second time. |

| | |
|---|---|
| Password Generation Seed field | If you do not want to create the Linux password yourself, enter a seed phrase in this field and then press <**Generate Password**> to generate the password. |
| Auto Generated Password field | (Optional) The seed phrase appears as part of a random and secure password. You can use this password as is or further edit this automatically generated password.<br>Press <**Use Generated Password**> to save the password. |

After you provide the necessary information, correct any validation errors to proceed (if necessary).

m) Enter the configuration values for the settings provided in the **NTP SERVER SETTINGS** page in the wizard as described in this table, then select **next>>**.

| | |
|---|---|
| NTP Servers field | Enter one or more NTP server addresses or hostnames, separated by spaces. At least one NTP address or hostname is required. For a production deployment, we recommend that you configure a minimum of three NTP servers. The Catalyst Centers and the Catalyst Center Global Manager are required to either use a common NTP or achieve synchronization with a maximum time difference of one second between them.<br>**Note**<br>For NTP, ensure port 123 (UDP) is open between Catalyst Center Global Manager and your NTP server. |
| NTP Authentication check box | To enable the authentication of your NTP server before it's synchronized with, check this check box and then enter these information:<br>• The NTP server's key ID. Valid values range between 1 and 4294967295 (2^32-1).<br>This value corresponds to the key ID that's defined in the NTP server's key file.<br>• The SHA-1 key value associated with the NTP server's key ID. This 40-character hex string resides in the NTP server's key file.<br>**Note**<br>Ensure that you enter a key ID and key value for each NTP server that you configured in the previous field. |

After you provide the necessary information, correct any validation errors to proceed (if necessary).

A final message appears, stating that the wizard is ready to apply the configuration.

n) Enter the configuration values for the settings provided in the **MAGLEV ADVANCED SETTINGS** page in the wizard, as described in this table. Then click **next>>**.

| | |
|---|---|
| Container Subnet field | A dedicated, non-routed IP subnet that Catalyst Center Global Manager uses to manage internal services. By default, this is already set to **169.254.32.0/20**, and we recommend that you use this subnet. If you choose to enter another subnet, ensure that it does not conflict with or overlap any other subnet used by the Catalyst Center Global Manager on internal network or an external network. For more information, see the Container Subnet description in the *Catalyst Center Second-Generation Appliance Installation Guide's* "Required IP Addresses and Subnets" topic. |
| Cluster Subnet field | A dedicated, non-routed IP subnet that Catalyst Center Global Manager uses to manage internal cluster services. By default, this is already set to **169.254.48.0/20**, and we recommend that you use this subnet. If you choose to enter another subnet, ensure that it does not conflict with or overlap any other subnet used by the Catalyst Center Global Manager internal network or an external network. For more information, see the Cluster Subnet description in the *Catalyst Center Second-Generation Appliance Installation Guide's* "Required IP Addresses and Subnets" topic. |

After you provide the necessary information, correct any validation errors to proceed (if necessary).

A final message appears, stating that the wizard is ready to apply the configuration.

o) To apply the settings you've entered to the virtual appliance, select **proceed>>**.

After the configuration process completes, the virtual appliance powers on again and displays a **CONFIGURATION SUCCEEDED!** message.

It takes around 180 to 210 minutes for the virtual machine to become operational. The actual time will depend on things like available bandwidth, RAM, hard disk space, and the number of vCPUs. You can monitor the progress in the vSphere Client's **Recent Tasks** tab.

# Configure a virtual appliance using the web install configuration wizard

To quickly configure a virtual appliance using preset appliance settings, use the browser-based install configuration wizard.

**Important** Enter valid IPv4 addresses with matching netmasks during this procedure. Make sure addresses and their subnets do not overlap. If subnets or addresses overlap, service communication issues can occur.

### Before you begin

Collect these information before you begin:

- Static IP address
- Subnet mask
- Default gateway
- DNS address

- NTP server details
- Proxy server details

Use a supported browser. For more information on supported browsers, see the Additional deployment requirements section.

Enable ICMP on the firewall between Catalyst Center Global Manager and the DNS servers you plan to specify. This wizard uses Ping to verify the DNS server you specify. This ping can be blocked if there is a firewall between Catalyst Center Global Manager and the DNS server and ICMP is not enabled on that firewall. If ICMP is not enabled, you cannot complete the wizard.

### Procedure

**Step 1** After deployment completes, power on the new virtual machine:

a) In the vSphere Web Client, right-click the virtual machine.
b) Choose **Power** > **Power On**.

It takes around 45 minutes for the virtual machine to become operational. The actual time depends on available bandwidth, RAM, hard disk space, and the number of vCPUs. You can monitor the progress in the **Recent Tasks** tab in vSphere Client.

**Step 2** Launch either the remote console or web console by clicking the appropriate link.

**Step 3** Start the install configuration wizard:

a) In the **STATIC IP CONFIGURATION** page, do one of these steps:

- Select **skip**>> to go to the CLI-based install.
- If you want to assign your own IP address, subnet mask, and default gateway to your virtual appliance's Enterprise interface, enter the information described in this table and then select **configure**>>.

For IPv4 deployments, this check box must be cleared.

| | |
|---|---|
| IP Address field | Enter the static IP address that you want to use. |
| Netmask field | Enter the netmask for the IP address you specified in the previous field. You can enter either a netmask or CIDR address. |
| Default Gateway Address field | Specify the default gateway that will be used to route traffic. |
| Static Routes field | Leave this field blank; you cannot specify static routes in this wizard. |

Note the URL listed in the **Web Installation** field. Save this information for the next step.

b) Open the URL that was displayed in the **Static IP Configuration** page.
c) Click the **Start a Cisco Catalyst Center Global Manager** radio button, then click **Next**.
d) Click the **Install** radio button, then click **Start**.

The **Overview** window opens. Click > to view a summary of the tasks that the wizard will help you complete.

e) Click **Start Workflow** to start the wizard.

The **Virtual Appliance Interfaces** page opens.

**Step 4** Configure your virtual appliance by completing the install configuration wizard:

a) Click **Next**.

The **DNS Configuration** page opens.

b) In the **DNS** field, enter the IP address of the preferred DNS server. To enter additional DNS servers, click the **Add** (+) icon.

**Important**
You can configure a maximum of three DNS servers. If you configure more than three DNS servers for an appliance, you may encounter problems.

c) Click **Next**.

The **Configure Proxy Server Information** page opens.

d) Do one of these steps:

- If your network does not use a proxy server to access the internet, click the **No** radio button and then click **Next**.
- If your network uses a proxy server to access the internet, enter the values described in this table and then click **Next**.

| | |
|---|---|
| Proxy Server field | Enter the URL or host name of an HTTPS network proxy used to access the Internet.<br>**Note**<br>Connection from Catalyst Center Global Manager to the HTTPS proxy is supported only via HTTP in this release. |
| Port field | Enter the port that your appliance used to access the network proxy. |
| Username field | Enter the username used to access the network proxy. If no proxy login is required, leave this field blank. |
| Password field | Enter the password used to access the network proxy. If no proxy login is required, leave this field blank. |

The **Advanced Appliance Settings** page opens in the wizard.

e) Enter configuration values for your appliance, then click **Next**.

| **NTP Server Settings** | |
|---|---|
| NTP Server field | Enter at least one NTP server address or hostname. To enter additional NTP server addresses or hostnames, click the **Add** (+) icon.<br>For a production deployment, we recommend that you configure at least three NTP servers. |

| | |
|---|---|
| Turn on NTP Authentication check box | To enable the authentication of your NTP server before it's synchronized with Catalyst Center Global Manager, check this check box and then enter these information:<br>• The NTP server's key ID. Valid values range between 1 and 4294967295 (2^32-1).<br>This value is the key ID defined in the NTP server's key file.<br>• The SHA-1 key value associated with the NTP server's key ID. This 40-character hex string resides in the NTP server's key file.<br>**Note**<br>Ensure that you enter a key ID and key value for each NTP server that you configured in the previous field. |
| **Subnet Settings** | |
| Container Subnet field | A dedicated, nonrouted IP subnet that Catalyst Center Global Manager uses to manage internal services. By default, this is already set to **169.254.32.0/20**, and you cannot enter another subnet. |
| Cluster Subnet field | A dedicated, nonrouted IP subnet that Catalyst Center Global Manager uses to manage internal cluster services. By default, this is already set to **169.254.48.0/20**, and you cannot enter another subnet. |

The **Enter CLI Password** page opens.

f) Enter and confirm the password for the `maglev` user, then click **Next**.

**Note**
According to the CLI password policy, your new password must differ from the last 24 passwords you have used.

Use this username and password to access the CLI for troubleshooting. After you log in, the system prompts you to configure a new admin user for security.

The wizard validates the information that you entered and notifies you if you need to change any settings before you can proceed. If the settings you entered are valid, the wizard's **Summary** page opens.

**Note**
To download the appliance configuration as a JSON file, click the corresponding link.

g) Scroll to the bottom of the screen and review all of the settings that you have entered while completing the wizard. To update settings, click the corresponding **Edit** link.

h) To complete the configuration of your Catalyst Center Global Manager virtual appliance, click **Start Configuration**.

The **Appliance Configuration in Progress** page continuously updates during the process, indicating the tasks that are currently being completed and their progress, as well as any errors that have occurred. Click the **Download** link to save a local copy of this information as a text file.

**Step 5** After appliance configuration completes, the **Appliance Configuration Complete!** page opens. Then click the copy icon to copy the default admin superuser password.

**Important**
Catalyst Center Global Manager automatically sets this password when you complete the install configuration wizard. Ensure that you click the copy icon before you proceed. Otherwise, you will not be able to log in to Catalyst Center Global Manager for the first time.

**Note**
As a security measure, you'll be prompted to set up a new username and password after you log in. The default admin account will be deleted.

# Configure a virtual appliance using the advanced web install configuration wizard

If you want to configure a virtual appliance using the browser-based advanced install configuration wizard and need to specify settings that are different from the preset appliance settings, complete these steps.

**Important** Ensure that all of the IP addresses you enter while completing this procedure are valid IPv4 addresses with valid IPv4 netmasks. Also make sure that the addresses and their corresponding subnets do not overlap. If the addresses and subnets overlap, service communication issues may occur.

## Procedure

**Step 1** After deployment completes, power on the newly-created virtual machine:

a) In the vSphere Web Client, right-click the virtual machine.

b) Choose **Power** > **Power On**.

The virtual machine typically becomes operational in 90 to 120 minutes, depending on available bandwidth, RAM, hard disk space, and the number of vCPUs. You can monitor the progress in the vSphere Client's **Recent Tasks** tab.

**Step 2** Launch either the remote console or web console by clicking the appropriate link.

**Step 3** Open the advanced install configuration wizard:

a) In the **STATIC IP CONFIGURATION** page, do one of these steps:

- Select **skip**>>.
- If you want to assign your own IP address, subnet mask, and default gateway to your virtual appliance's Enterprise interface, enter the information described in the table and then select **configure**>>.

For IPv4 deployments, this check box needs to remain unchecked.

| | |
|---|---|
| IP Address field | Enter the static IP address that you want to use. |

| | |
|---|---|
| Netmask field | Enter the netmask for the IP address you specified in the previous field. You can enter either a netmask or CIDR address. |
| Default Gateway Address field | Specify the default gateway that will be used to route traffic. |
| Static Routes field | Do not specify static routes with this wizard; leave the field blank. |

Note the URL listed in the **Web Installation** field. You'll need this for the next step.

b) Open the URL that was displayed in the **Static IP Configuration** page.
c) Click the **Start a Cisco Catalyst Center Global Manager** radio button, then click **Next**.
d) Click the **Advanced Install** radio button, then click **Start**.

The **Advanced Install Overview** window opens. Click > to view a summary of the tasks that the wizard will help you complete.

e) Click **Start Workflow** to start the wizard.

The **Virtual Appliance Interface Overview** page opens, providing a description of the four appliance interfaces that you can configure.

**Step 4** Configure your virtual appliance by completing the advanced install configuration wizard:

a) Click **Next**.

The **How would you like to set up your virtual appliance interfaces** page opens

If your network resides behind a firewall, perform these actions:

- Click the **allow access to these URLs** link to view a pop-up window that lists the URLs that Catalyst Center Global Manager must be able to access.
- Click the **open these ports** link to view a pop-up window that lists the network service ports that must be available for Catalyst Center Global Manager to use.

By default, the **Enterprise Network Interface** check box is already checked. It's also prepopulated with the values you entered in the **STATIC IP CONFIGURATION** page.

b) Complete these steps for each appliance interface you want to use, then click **Next**:

- Click its check box and enter the appropriate configuration values.
- If necessary, click its **Add/Edit Static Route** link to configure static routes. Click + as needed to configure additional routes. When you're done, click **Add**.

The **DNS Configuration** screen opens.

c) Enter the IP address of the preferred DNS server, then click **Next**. To enter additional DNS servers, click the **Add** (+) icon.

**Important**

- For each node in your cluster, configure a maximum of three DNS servers. If you configure more than three DNS servers for an appliance, you may encounter problems.
- For NTP, ensure port 123 (UDP) is open between Catalyst Center Global Manager and your NTP server.

The **Configure Proxy Server Information** screen opens.

d) Do one of these steps and then click **Next**:

- If your network does *not* use a proxy server to access the internet, click the **No** radio button.
- If your network does use a proxy server to access the internet, enter the values described in the table:

| | |
|---|---|
| Proxy Server field | Enter the URL or host name of an HTTPS network proxy used to access the Internet.<br>**Note**<br>Connection from Catalyst Center Global Manager to the HTTPS proxy is supported only via HTTP in this release. |
| Port field | Enter the port your appliance uses to access the network proxy. |
| Username field | Enter the user name used to access the network proxy. If no proxy login is required, leave this field blank. |
| Password field | Enter the password used to access the network proxy. If no proxy login is required, leave this field blank. |

The wizard validates the information you have entered and notifies you of any settings that need to be changed before you can proceed with the wizard. If the settings you have entered are valid and the port is up, the wizard's **Advanced Appliance Settings** screen opens.

e) Enter configuration values for your appliance, then click **Next**.

| | |
|---|---|
| **NTP Server Settings** | |
| NTP Server field | Enter at least one NTP server address or hostname. To enter additional NTP server addresses or hostnames, click the **Add** (+) icon.<br>For a production deployment, Cisco recommends that you configure a minimum of three NTP servers. |
| Turn On NTP Authentication check box | To enable the authentication of your NTP server before it's synchronized with Catalyst Center Global Manager, check this check box and then enter these information:<br>• The NTP server's key ID. Valid values range between 1 and 4294967295 (2^32-1).<br>This value corresponds to the key ID that's defined in the NTP server's key file.<br>• The SHA-1 key value associated with the NTP server's key ID. This 40-character hex string resides in the NTP server's key file.<br>**Note**<br>Ensure that you enter a key ID and key value for each NTP server that you configured in the previous field. |
| **Subnet Settings** | |

| | |
|---|---|
| Container Subnet field | A dedicated, non-routed IP subnet that Catalyst Center Global Manager uses to manage internal services. By default, this is already set to **169.254.32.0/20**, and we recommend that you use this subnet. |
| Cluster Subnet field | A dedicated, non-routed IP subnet that Catalyst Center Global Manager uses to manage internal cluster services. By default, this is already set to **169.254.48.0/20**, and we recommend that you use this subnet. |

The **Enter CLI Password** page opens.

f) Enter and confirm the password for the `maglev` user, then click **Next**.

**Note**
According to the CLI password policy, your new password must differ from the last 24 passwords you have used.

The wizard validates the information you have entered and notifies you of any settings that need to be changed before you can proceed with the wizard. If the settings you have entered are valid, the wizard's **Summary** page opens.

**Note**
To download the appliance configuration as a JSON file, click the corresponding link.

g) Scroll to the bottom of the screen and review all the settings that you entered while completing the wizard. If necessary, click the appropriate **Edit** link to open the wizard screen in which you want to make updates.

h) To complete the configuration of your Catalyst Center Global Manager virtual appliance, click **Start Configuration**.

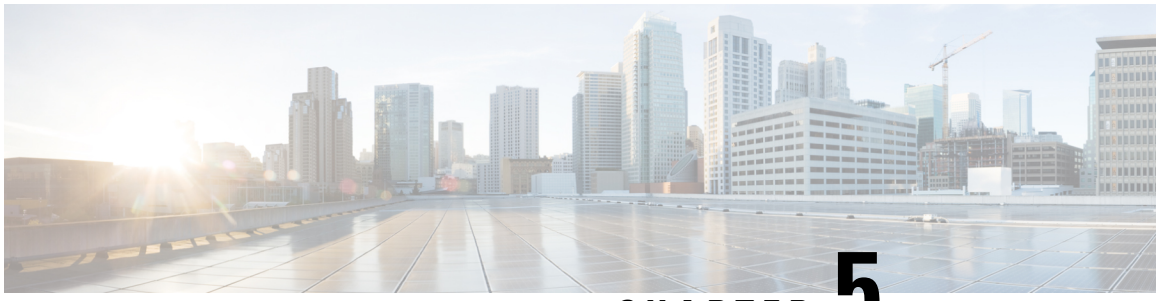
The **Appliance Configuration in Progress** page continuously updates during the process, indicating the tasks that are currently being completed and their progress, as well as any errors that have occurred. To save a local copy of this information as a text file, click the **Download** link.

The virtual machine typically becomes operational in 180 to 210 minutes, depending on available bandwidth, RAM, hard disk space, and the number of vCPUs. You can monitor the progress in the vSphere Client's **Recent Tasks** tab.

**Step 5** After appliance configuration completes, the **Appliance Configuration Complete!** page opens. Then click the copy icon to copy the default admin superuser password.

It can take from 15 to 30 minutes for services to be stabilized before you can log in to the GUI.

**Important**
Catalyst Center Global Manager automatically sets this password when you complete the Install configuration wizard. Ensure that you click the copy icon before you proceed. Otherwise, you cannot log in to Catalyst Center Global Manager for the first time.



CHAPTER 5

# Deploy Catalyst Center Global Manager on AWS using AWS CloudFormation



# Prerequisites for deployment of Catalyst Center Global Manager using AWS CloudFormation

Before deploying Catalyst Center Global Manager on AWS, ensure you meet these network, AWS, and requirements.

### Network environment requirements

You have this information about your network environment on hand:

- Enterprise DNS server IP address
- (Optional) HTTPS network proxy details

### AWS account requirements

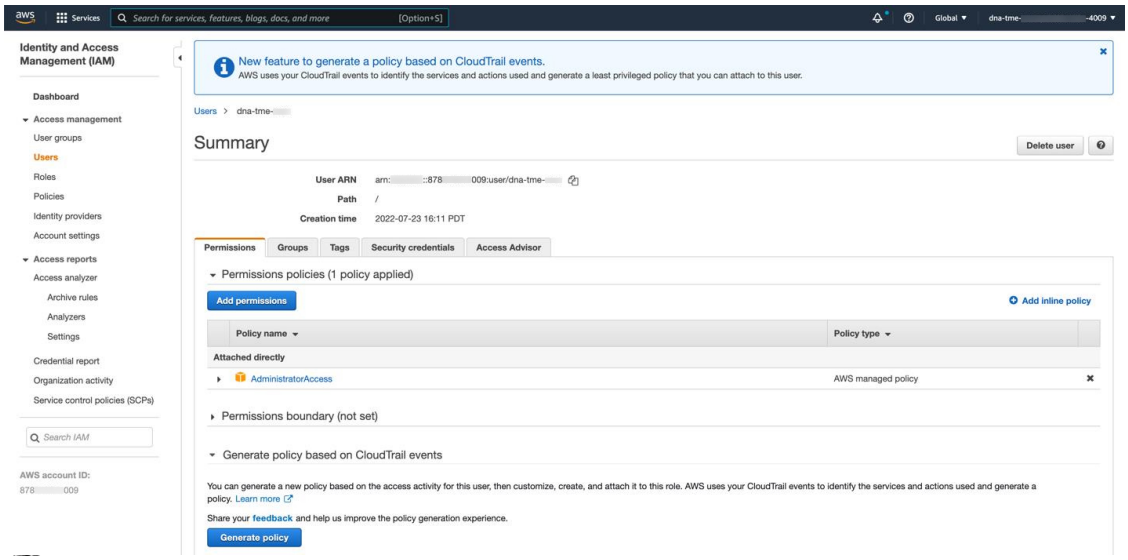
You must meet these AWS account requirements:

- You have valid credentials to access your AWS account.

**Tip** We recommend that your AWS account be a subaccount (a child account) to maintain resource independence and isolation. A subaccount ensures that the Catalyst Center Global Manager deployment does not impact your existing resources.

- **Important**: Your AWS account is subscribed to Cisco Catalyst Center Global Manager Virtual Appliance - BYOL in AWS Marketplace.

- You have administrator access permission for your AWS account. In AWS, the policy name is displayed as




### AWS network infrastructure requirements

You must set up these resources and services in AWS:

- **VPC**: The recommended CIDR range is /25. In IPv4 CIDR notation, the last octet (the fourth octet) of the IP address can only be 0 or 128. For example, x.x.x.0 or x.x.x.128 are valid options.
- **Subnets**: The recommended subnet range is /28, and it should not overlap with your corporate subnet.
- **Route tables**: Make sure that your VPC subnet is allowed to communicate with your enterprise network through your VPN Gateway (VPN GW) or Transit Gateway (TGW).
- **Security groups**: To ensure communication between Catalyst Center Global Manager on AWS and the Catalyst Center in your enterprise network, the AWS security group attached to Catalyst Center Global Manager on AWS must allow the TCP port 443.
  - TCP ports: 443

  For more information about the ports that Catalyst Center Global Manager uses, see Required firewall ports and connectivity.
- **VPN GW or TGW**: You must have an existing connection to your enterprise network, which is your Customer Gateway (CGW).

  For your existing connection from the CGW to AWS, ensure that the correct ports are open for traffic flow to and from your Catalyst Center Global Manager VA. You can open them using either the firewall settings or a proxy gateway. For information about the well-known network service ports that the appliance uses, see Required firewall ports and connectivity.
- **Site-to-Site VPN connection**: You can use TGW attachments and TGW route tables.

### AWS region configuration requirements

You must meet these AWS region configuration requirements:

- Your AWS environment must be configured with one of these regions:
  - ap-northeast-1 (Tokyo)
  - ap-northeast-2 (Seoul)
  - ap-south-1 (Mumbai)
  - ap-southeast-1 (Singapore)
  - ap-southeast-2 (Sydney)
  - ca-central-1 (Canada)
  - eu-central-1 (Frankfurt)
  - eu-south-1 (Milan)
  - eu-west-1 (Ireland)
  - eu-west-2 (London)
  - eu-west-3 (Paris)
  - us-east-1 (Virginia)
  - us-east-2 (Ohio)
  - us-west-1 (Northern California)
  - us-west-2 (Oregon)

### IAM user group requirement (optional)

If you want to enable multiple IAM users with the ability to configure Catalyst Center Global Manager using the same environment setup, you need to create a group with these policies and then add the required users to that group:

- IAMReadOnlyAccess
- AmazonEC2FullAccess
- AWSCloudFormationFullAccess

### Catalyst Center Global Manager instance requirements

The Catalyst Center Global Manager instance size must meet these minimum resource requirements:

- c5.2xlarge

**Note** Catalyst Center Global Manager supports only the c5.2xlarge instance size. Any changes to this configuration aren't supported.

- 8 virtual CPUs (vCPUs)
- 16-GB RAM

- 2500 disk input and output operations per second (IOPS)
- 180-MBps disk bandwidth

### Catalyst Center Global Manager backup instance requirements

The Catalyst Center Global Manager backup instance must meet these minimum resource requirements based on if you use a cloud server or an enterprise (on-premises) server:

- **Cloud backup**: t3.micro, 2 vCPUs, 1-GB RAM, and for storage, see Backup storage requirements.
- **Enterprise backup**: See Backup server requirements and Backup storage requirements.

### AWS information requirements

You have this AWS information on hand:

- Subnet ID
- Security group ID
- Keypair ID
- Environment name
- CIDR reservation

### Catalyst Center Global Manager environment requirements

You must meet these requirements for your Catalyst Center Global Manager environment:

- You have access to the Catalyst Center Global Manager GUI.
- You have this Catalyst Center Global Manager information on hand:
  - Default gateway setting
  - CLI password
  - FQDN for the Catalyst Center Global Manager VA IP address

# Deploy Catalyst Center Global Manager on AWS using AWS CloudFormation

Follow these steps to deploy Catalyst Center Global Manager on AWS using AWS CloudFormation. The provided AWS CloudFormation template contains the relevant details for all required parameters.

### Before you begin

Ensure that

- the VPN tunnel is up, and
- the AWS environment is set up with all the required components.

For information, see Prerequisites for deployment using AWS CloudFormation.

### Procedure

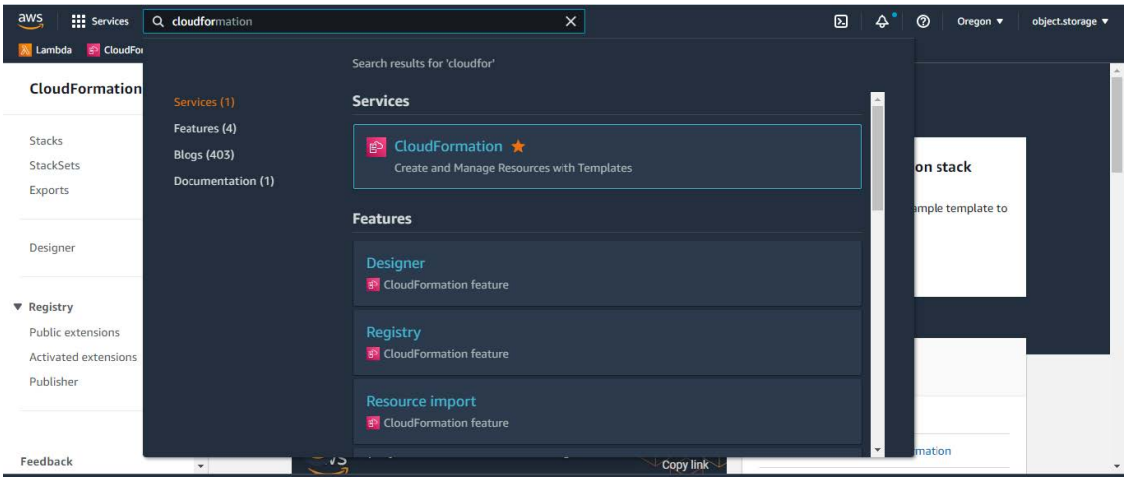
**Step 1** Verify that the TAR file is genuine and from Cisco Systems, Inc.

For detailed steps, see Verify the Catalyst Center Global Manager VA TAR file.

**Step 2** Log in to the AWS console.

The AWS console is displayed.

**Step 3** In the search bar, enter **`cloudformation`**.




**Step 4** From the drop-down menu, choose **CloudFormation**.

**Step 5** Click **Create stack** and choose **With new resources (standard)**.

**Step 6** Under **Specify template**, select **Upload a template file**, and choose the AWS CloudFormation template that you downloaded in Step 1.

**Step 7** Enter a stack name and review these parameters:

- **EC2 Instance Configuration**
  - **Environment Name**: Assign a unique environment name.

    The environment name is used to differentiate the deployment and is prepended to your AWS resource names. If you use the same environment name as a previous deployment, the current deployment will fail.
  - **Private Subnet ID**: Enter the VPC subnet to be used for Catalyst Center Global Manager.
  - **Security Group**: Enter the security group to be attached to the Catalyst Center Global Manager VA that you are deploying.
  - **Keypair**: Enter the SSH keypair used to access the CLI of Catalyst Center Global Manager VA that you are deploying.
- **Catalyst Center Global Manager Configuration**: Enter this information:
  - **CatalystCenterGlobal ManagerInstanceIP**: Catalyst Center Global ManagerIP address.

- **CatalystCenterGlobal ManagerNetmask**: Catalyst Center Global Manager netmask.
- **CatalystCenterGlobal ManagerGateway**: Catalyst Center Global Manager gateway address.
- **CatalystCenterGlobal ManagerDnsServer**: Enterprise DNS Server.
- **CatalystCenterGlobal ManagerPassword**: Catalyst Center Global Manager password.

  **Note**
  You can use the Catalyst Center Global Manager password to access the Catalyst Center Global Manager VA CLI through the AWS EC2 Serial Console.

  The password must

  - omit any tab or line breaks
  - have at least eight characters, and
  - contain characters from at least three of these categories.
    - Lowercase letters (a-z)
    - Uppercase letters (A-Z)
    - Numbers (0-9)
    - Special characters (for example, ! or #)

- **CatalystCenterGlobal ManagerFQDN**: Catalyst Center Global Manager FQDN.
- **CatalystCenterGlobal ManagerHttpsProxy**: (Optional) Enterprise HTTPS proxy.
- **CatalystCenterGlobal ManagerHttpsProxyUsername**: (Optional) HTTPS proxy username.
- **CatalystCenterGlobal ManagerHttpsProxyPassword**: (Optional) HTTPS proxy password.

**Step 8** (Optional) Click **Next** to configure the stack options.

**Step 9** Click **Next** to review your stack information.

**Step 10** Click **Submit** when you are satisfied with the configuration.

Stack creation usually takes 45 to 60 minutes.

# Verify the Catalyst Center Global Manager VA TAR file

Before deploying the Catalyst Center VA, we recommend that you verify that the TAR file that you downloaded is a genuine Cisco TAR file.

### Before you begin

Ensure that you downloaded the Catalyst Center Global Manager VA TAR file from the Cisco Software Download site.

### Procedure

**Step 1** Download the Cisco public key (cisco_image_verification_key.pub) for signature verification from the location specified by Cisco.

**Step 2** Download the secure hash algorithm (SHA512) checksum file for the TAR file from the location specified by Cisco.

**Step 3** Obtain the signature file (.sig) for the TAR file from Cisco support through email or by download from the secure Cisco website (if available).

**Step 4** (Optional) Perform an SHA verification to determine whether the TAR file is corrupted due to a partial download.

Depending on your operating system, enter one of these commands:

- On a Linux system: **sha512sum** <tar-file-filename>
- On a macOS system: **shasum -a 512** <tar-file-filename>

On Microsoft Windows, use the certutil tool because it does not include a built-in checksum utility:

```
certutil -hashfile <filename> sha256
```

For example:

On Windows, you can also use Windows PowerShell to generate the digest. For example:

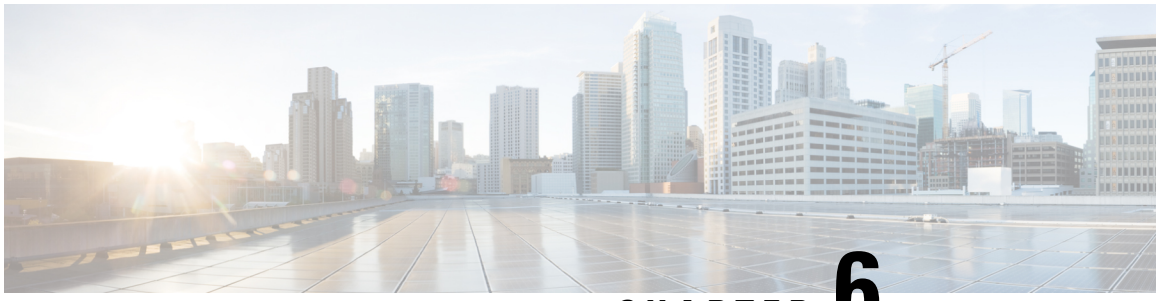
Compare the command output to the SHA512 checksum file that you downloaded. If the command output does not match the SHA512 checksum file, download the TAR file again and run the appropriate command again. If the output still does not match, contact Cisco support.

**Step 5** Verify that the TAR file is genuine and from Cisco by verifying its signature:

**openssl dgst -sha512 -verify cisco_image_verification_key.pub -signature** <signature-filename> <tar-file-filename>

**Note**
This command works in both Mac and Linux environments. For Windows, you must download and install OpenSSL (available on the OpenSSL Downloads site) if you have not already done so.

If the TAR file is genuine, running this command displays a `Verified OK` message. If this message fails to appear, do not install the TAR file and contact Cisco support.



CHAPTER 6

# Get Started



# Log in to Catalyst Center Global Manager and run it

After you have deployed and configured the Catalyst Center Global Manager virtual appliance, you can log in to its GUI. Use a compatible, HTTPS-enabled browser when accessing Catalyst Center Global Manager.

Follow these steps to log in and access Catalyst Center Global Manager:

**Procedure**

**Step 1** Access the Catalyst Center Global Manager GUI by entering HTTPS:// URL and the IP address of the Catalyst Center Global Manager GUI displayed at the end of the configuration process.

The Catalyst Center Global Manager login page appears.

**Note**
It is recommended to use a private or incognito browser window when accessing the GUI. Ensure that you are using a supported browser. For more information on "supported browsers" and "screen resolution", see the Additional deployment requirements section.

**Step 2** Log in to Catalyst Center Global Manager using the default username and password you configured for the new admin user.

- In the **Username** field, type **admin**
- In the **Password** field, type **P@ssword9**

**Note**
These are the default login credentials to access the GUI for the first time. The system deletes them after you create a new user account in step 3.

**Step 3** Create a new user account for Catalyst Center Global Manager after the password is authenticated.

- Catalyst Center Global Manager logs you out. Log back in using the newly created user account.
- Each of the controllers managed by Catalyst Center Global Manager should have an identical user account created on it.

**Step 4** Click **Log In** after creating the Catalyst Center Global Manager account to complete the first-time set up.

The **Terms and Conditions** window appears, providing links to the **Cisco General Terms** (formerly known as End User License Agreement (EULA)) and any supplemental terms that are currently available.

**Step 5** Click **Next** to accept the terms and conditions.

The **Login to Cisco.com** window appears.

Ensure that you:

- use the valid cisco.com user id for completing the registration workflow.
- enable the pop-ups for the page in the browser.

**Step 6** Click **Next**.

The **Activate your device** window appears.

**Step 7** Click **Next** to get the activation code and activate the Catalyst Center Global Manager to Cisco Catalyst Cloud.

The **Device activated** window appears.

Then the **Registration to Catalyst cloud completed** window appears.

After you have logged in successfully, the screen will show the registration status between the Catalyst Center Global Manager and the Cisco Catalyst Cloud.

**Note**
If you cannot log in, a failure message appears indicating that registration with Cisco Catalyst Cloud could not be completed due to an authentication issue. In this case, wait a few minutes and sign in again, or check your browser pop-up settings.

**Step 8** Click **Launch the Global Manager** to enter the Catalyst Center Global Manager GUI dashboard for the first time.

You will be redirected to the **Overview** page in Catalyst Center Global Manager, with instructions to enroll the Catalyst Center controller.

**Note**
- The menu displays only a few options, such as **Overview**, **Activities**, and **System**, when there are no controllers enrolled on day-0 or after all controllers are deleted on day-n.

- The **Overview** page displays a standard message regarding controller registration.

# Enroll Catalyst Center to Catalyst Center Global Manager

To register Catalyst Center with Catalyst Center Global Manager, it's necessary to integrate Catalyst Center with the Cisco Catalyst Cloud. Log in to Catalyst Center to start the process.

**Note** The minimum supported versions of the Catalyst Center are 2.3.7.9, 2.3.7.10, 2.3.7.11, 3.1.3, 3.1.5 and 3.1.6.

### Procedure

**Step 1** From the **Overview** menu, click **Add a controller** to enroll a new Catalyst Center controller.

You are redirected to the **Controllers** page to add a controller.

The **Add Controller** window appears.

**Step 2** Enter these details:

- **Controller Name**: Enter the name of controller. This is optional.
- **Controller IP Address or FQDN**: Enter the reachable IP address or FQDN.

  **Note**
  This address is only used for initial enrollment setup completion.

- **Controller Member ID**: Enter member ID of the Catalyst Center.

  **Note**
  **Member ID** is a global unique identifier for each instance of the controller that gets assigned when it gets created and is registered with the Catalyst Center Global Manager Cloud.

  To obtain the member ID of the Catalyst Center:

  **a.** Log into your Catalyst Center dashboard.

  **b.** Click the **?** icon in the Catalyst Center product header, then select **About** > **Member ID** to view your member ID.

**Step 3** Click **Add**.

The controller gets added to the Catalyst Center Global Manager. The **Connect to controller** window appears.

**Step 4** Click **Sign in to controller** to complete the enrollment of Catalyst Center Global Manager from the controller side.

You will be prompted to login to the controller to finish enrollment.

The Catalyst Center page appears.

You need to finish enrollment in Catalyst Centerin the **Settings** > **External Services** > **Global Manager Integration** page. Once you successfully authenticate, it will show the **Global Manager Integration** page of the Catalyst Center to complete the enrollment.

**Step 5** Click **Enroll** to link the Catalyst Center with Catalyst Center Global Manager.

**Note**
You can enroll a controller later when it appears as **pending connection** on the **System** > **Controllers** page. Select the controller and follow the instructions to enroll in the **Controller Details** window.

Alternatively, you can enroll or delete a controller from the **System** > **Controllers** page. Click the ellipses (...) adjacent to the controller you want to manage, then select the appropriate option to view, edit the controller name, enroll, or delete the controller.

Deleting a controller is a two-step process:

**a.** Unenroll the controller. This action changes the controller status from **Reachable** to **Pending** connection.

**b.** Select the controller to delete from Catalyst Center Global Manager.

You can delete only the pending controllers from the **System** > **Controller** page section

You cannot delete an unreachable controller from Catalyst Center Global Manager. You must wait until the controller comes online before deleting it.

**Note**
You must add a unique controller Member ID in the Catalyst Center Global Manager. The same controller Member ID cannot be added to multiple Catalyst Center Global Manager setups.

### What to do next

Go to the Catalyst Center Global Manager dashboard. A toast notification will appear for the newly enrolled controller. This notification includes a **Refresh** link for you to update the page and view data from the controller.

Once the menu options are updated, go to the **Controllers** page to:

- View the new Catalyst Center added to the Catalyst Center Global Manager.
- Edit the pending controllers.
- Enroll or add a new controller.

# Site Hierarchy

The **Site Hierarchy** selector in Catalyst Center Global Manager offers an aggregated view of all sites across different controllers. When multiple controllers share the same site (for example, Global/USA/East Coast), those sites are combined and presented as a single node in the site selector. The content displayed on the pages will be filtered based on the site that you select. An unfiltered view is also available.

The **Site Hierarchy** selector lists the first 100 nodes at each level. You can search for a specific site by entering a string and then click **Enter** or the **Search** button to initiate the search.

**Refresh site hierarchy**

There are effectively three scenarios to trigger a refresh of site hierarchy:

1. If there any updates on the sites in any of the controllers, you need to manually click the **Refresh** button in the site selector to reload the data from all the controllers.
2. If any updates on the controller's reachability, such as updates on the controller or changes in reachability (for example, a controller becoming reachable or unreachable), then a manual **Refresh** is required in the site selector.

**Note** Selecting a site will reflect the network health and alerts data on the **Overview** dashboard, as well as the other second-level pages data.

The network health and alerts are specific to each site, whereas the controller health is not site-specific.

3. In case of any error while populating the site data, an error count shows up in the bottom bar next to the **Refresh**.

The site selector does not automatically refresh for all changes; it only automatically refreshes the controller's sites in response to specific events such as:

- Controller enrollment with toast notification refresh.
- Unenrollment with toast notification refresh.

For these events, there's no need to manually click the **Refresh** button. In contrast, an on-demand refresh in the Catalyst Center Global Manager site selector is required when there are changes to the sites on the controller side, such as adding, deleting, or modifying sites.

**Note** Catalyst Center Global Manager does not support non-global site-based RBAC for Catalyst Center sites; however, it displays globally scoped site-based RBAC sites in the site selector.

# Rename a site

You can rename sites in the **Site Hierarchy** from **Site management** for all related controllers. These modifications are configured on the Catalyst Centers.

**Note** You can only rename the buildings and areas; the global site and floors cannot be renamed.

You can edit the sites as long as they are included in the site hierarchy, regardless of whether they are fabric sites or non-fabric sites. There is no support for fabric zones functionality in Catalyst Center Global Manager, which means that the Catalyst Center Global Manager does not provide functionality to configure fabric zones.

**Procedure**

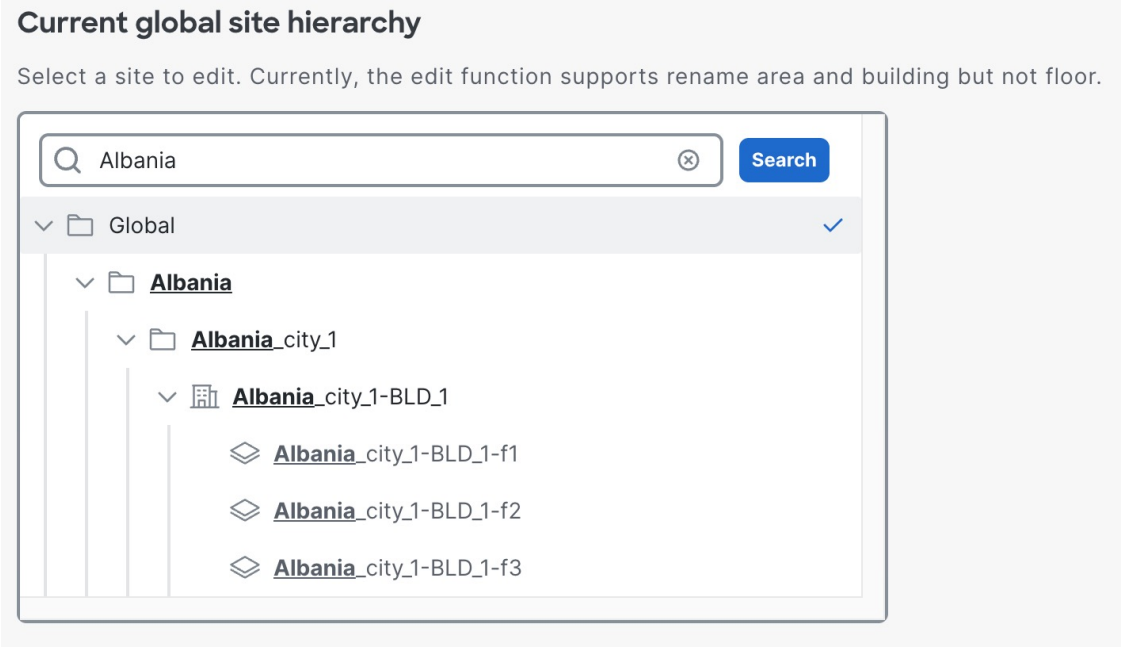
**Step 1** From the Catalyst Center Global Manager dashboard, go to the **Site Hierarchy Global** > **Site management** to rename the site.

The **Site Hierarchy Management** window appears.

**Step 2** Locate the site you want to rename and click **Search** on the **Site Hierarchy Management** page.

**Step 3** Click on the site you want to rename.

A pop-up window appears showing the impacted controllers for this site.




**Step 4** On the **Edit** page, update the site name or other relevant details you want to change.

**Step 5** Click **Save**.

The site is renamed successfully, and the updated site name appears in the site selector.

**Note**
In the site selector, the updated site name appears immediately. On other second-level pages such as **Alerts**, **Endpoints**, **Health**, and **Software-Defined Access**, the new site name appears after about 15 to 30 minutes.

If any errors occur, they are displayed in the final status of the operation.

# Monitor from the overview dashboard

The Catalyst Center Global Manager **Overview** page includes controller health and additional details about individual controllers.

After you log in to Catalyst Center Global Manager and add controllers, the Catalyst Center Global Manager starts rendering data on the **Overview** page progressively. You can see a progress bar on the **Overview** page when the data loads incrementally as Catalyst Center Global Manager receives data from the enrolled controllers. This process is known as progressive loading.

**Note** The total loading time of a page depends on the response time of each controller.

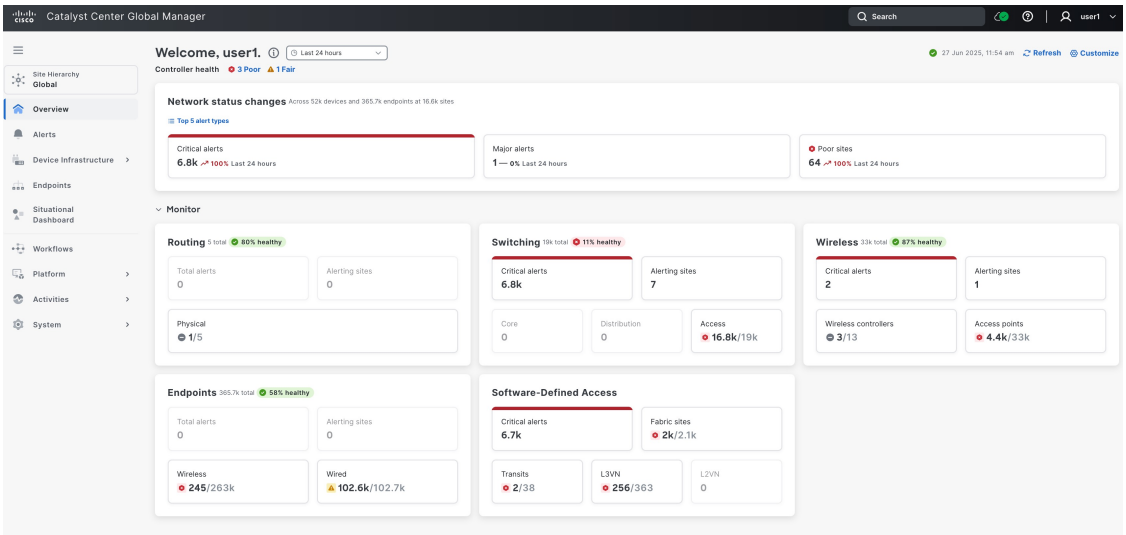
When all enrolled controllers respond with data, the progress bar turns green. The progress bar disappears within 5 seconds after the data load is complete.

All the second-level pages, including **Alerts**, **Device infrastructure**, **Endpoints**, and **Situational Dashboards** display a **Loading complete** progress indicator.

If the progess bar is:

- Green- If the loading is success and it will vanish in five seconds.
- Blue- While the loading is in progress.
- Red- If the loading fails, and it will give you the loading error.

**Note** If an error occurs while fetching data from enrolled controllers, the page displays a progress bar with error alerts. Hover over the bar to see how many controllers have responded. Click the loading status icon near the date and time to view detailed information about each failure for every dashlet in the **Overview** page.




Click **Refresh** to update the information displayed, ensuring you have the most current status of your network devices and components. This will provide you with the latest data on device health, performance, and any ongoing issues.

Click **Customize** to rearrange the dashlets within the different sections of the **Overview** page.

# Monitor controller health

Support is available to view the controller health status from Catalyst Center Global Manager for individual Catalyst Centers.

From the Catalyst Center Global Manager **Overview** page, click on the controller's health status. This action will redirect you to the **Controllers** page within the Catalyst Center Global Manager displaying filtered data based on your selection.

### Procedure

**Step 1** On the Catalyst Center Global Manager dashboard, go to the **Overview** page and click the controller health status to view the health of the number of displayed controllers shown. Alternatively, go to **System** > **Controllers** to view the same information.

**Step 2** Click one of the controller names to view the details. Use the cross-launch feature to access the respective controller's **System health** to view the health details and troubleshoot.

After this, you can proceed with additional troubleshooting steps on the Catalyst Center.

For information about controllers, see the Controllers.

# Monitor network status changes

**Network status changes** provides an overview of networks across all devices and endpoints at multiple sites managed by all the Catalyst Centers. Use this information to identify potential issues that may require attention.

### Procedure

From the Catalyst Center Global Manager dashboard, go to the **Overview** page to view the **Network status changes** section.

You can view these dashlets under **Network status changes**:

- Critical Alerts
- Major Alerts
- Poor Sites

# Monitor health of devices

Monitor these summaries and health of the devices:

- **Routing** allows you to view:
  - Minor alerts

    - Alerting sites
    - Physical
- **Switching** allows you to view:
    - Minor alerts
    - Alerting sites
    - Core
    - Distribution
    - Access
- **Wireless** allows you to view:
    - Minor alerts
    - Alerting sites
    - Wireless controllers
    - Access points
- **Endpoints** allows you to view:
    - Minor alerts
    - Alerting sites
    - Wireless
    - Wired
- **Software-Defined Access summaries** allows you to view:
    - Total alerts
    - Fabric sites
    - Transits
    - L2 VN
    - L3 VN

Clicking each sub-card count opens the corresponding second-level pages, such as **Alerts**, **Health**, **Software-Defined Access**, and **Endpoints**.

# Alerts

The **Alerts** feature in Catalyst Center Global Manager helps you view and explore details about alerts that require your attention. You can see different alert types and analytics, including the top site groups and segment types for each alert.

To view the alerts, navigate to the Catalyst Center Global Manager dashboard and click **Alerts**. The page progressively loads data as information is received from the enrolled controllers.

The alerts are categorized into four levels:

- Critical
- Major
- Minor
- Informational

To see more information about a specific alert, click the alert type name on **Alert types** to cross-launch or navigate to their respective controller.

The **Alerts** page also provides these details.

- Loading error: Displays a loading error if there are any issues with the controller, such as 401, 403, or if it is unreachable.
- Analytics: Analytics shows the top site groups and top segment types.
- Alert types: Alert types display a table of all alerts filtered by priority, segment type, and category.

# Device infrastructure

The **Device Infrastructure** in Catalyst Center Global Managershows filtered details of each device health and fabric site. Use it to ensure your devices and fabric sites are secure and working well.

## Device health

To view the health status of each device, navigate to the Catalyst Center Global Manager dashboard and click **Device Infrastructure** > **Health**. Then the page loads data progressively as it receives information from the enrolled controllers.

The health status categories are:

- Poor Health: Devices with a health score range from 1 to 3.
- Fair Health: Devices with a health score range from 4 to 7.
- No Health Data: Devices with no data.
- Good Health: Devices with a health score range from 8 to 10.

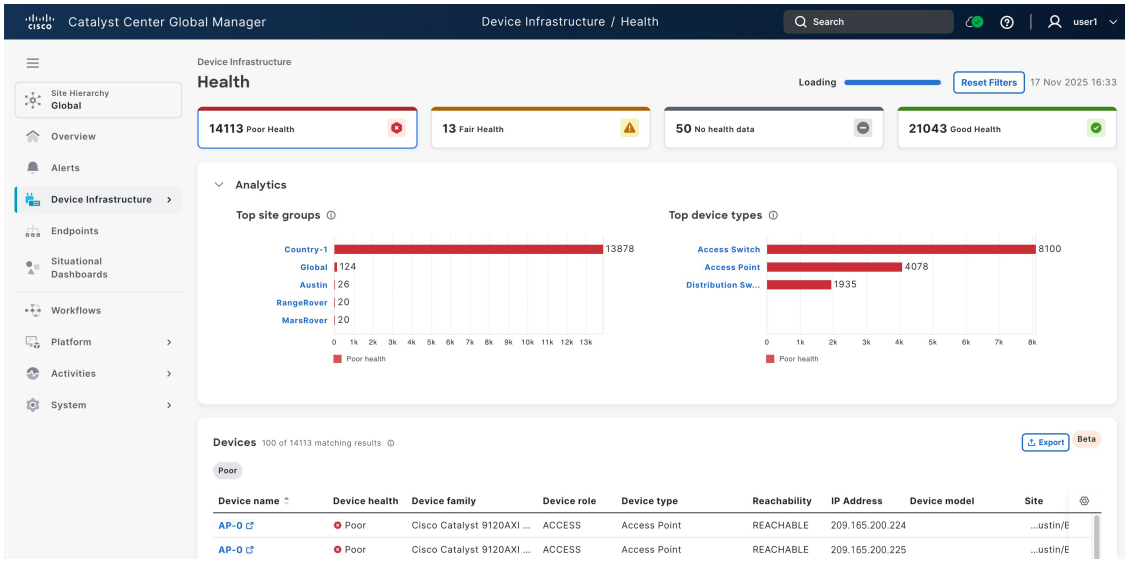
To see more information about a specific device, click the device name on **Devices** to cross-launch or navigate to their respective controller **Device 360** page.

The **Health** page also gives information on:

- Loading error: Displays a loading error if there are any issues with the controller, such as 401, 403, or if it is unreachable.
- Summary: Summary of network health based on each health category.

- Analytics: Analytics shows the top site groups and top device types.

  You can interact with site groups and device types by selecting and unselecting the filter and based on the devices that are listed in a table as shown in the image.




  For example: When a site group is selected from the **Top site groups** chart, the **Top device types** chart will highlight the device types associated with that selected site group. Conversely, selecting a device type from the **Top device types** chart will highlight the site groups in the **Top site groups** chart that include those device types.

  You can select filters from both the **Top site groups** and **Top device types** analytics sections simultaneously. The **Devices** table below will then display devices filtered by the combination of these selected criteria, with the active filters visually highlighted. Unselecting a site group or device type selection from the analytics charts will clear the corresponding filter and update the **Devices** table accordingly.

- Devices: Displays a table of all devices, including device name, device health, and device family, based on your selection.

  The devices table displays only 100 entries.

**Data export** allows you to export all the matching results from the table on the device **Health** page in CSV format.

You can apply filters to tables in Catalyst Center Global Manager; however, they are limited to display first 100 records of all the matching records in the list.

To export the device health:

1. From the main menu, choose **Device Infrastructure** > **Health**.
2. From the **Devices** section, click **Export**.

   The **Device health export** window appears.
3. Click **Export** to export all results that match the applied filter.

   You will receive a toaster notification when the export completes.

You can track the progress in the **Download** report tab.

4. Click **Download** to see the exported data with the respective filter showing the health status.

**Note**

- The data export process may take up to 30 minutes to complete because it progressively retrieves all matching results from the enrolled controller.
- Each exported file has a unique name.
- You can view the latest five exported reports, which are retained on the **Download** page for three days.

# Software-Defined Access health

To view the Software-Defined Access health status of each fabric site, transit, layer 3 virtual network (L3 VN), and layer 2 virtual network (L2 VN), navigate to the Catalyst Center Global Manager dashboard and click **Device Infrastructure** > **Software-Defined Access**. Then the page loads data progressively as it receives information from the enrolled controllers.

The health status categories are:

- Poor Health: Devices with a health score range from 1 to 3.
- Fair Health: Devices with a health score range from 4 to 7.
- No Health Data: Devices with no data.
- Good Health: Devices with a health score range from 8 to 10.

The **Software-Defined Access** page also gives information on:

- Loading error: Displays a loading error if there are any issues with the controller, such as 401, 403, or if it is unreachable.
- Fabric site health: It displays a table of fabric sites.
- Transit health: It displays a table of transits.
- Layer 3 virtual network health: It displays a table of L3 VNs.
- Layer 2 virtual network health: It displays a table of L2 VNs.

# End-of-Life Devices

To view the End-of-Life (EoL) of each device, navigate to the Catalyst Center Global Manager dashboard and click **Device Infrastructure** > **End-of-life Devices**. Then the page loads data progressively as it receives information from the enrolled controllers.

**Note** This feature is in beta.

The End-of-Life devices feature gives you an aggregate view of your Cisco devices that have reached or are nearing their End-of-Life (EoL) status, including key hardware and software expiration dates. This feature is similar to the EoX (End-of-life) feature in Catalyst Center, offering detailed reports on device lifecycle milestones to help with product upgrade and substitution planning.

Support for this feature is available on Catalyst Center platforms running software versions later than 2.3.7.10 and build 3.1.5.

The EoL devices display counts for these categories:

- Routers
- Switches
- Wireless
- Accessories (can be part of router/switches/wireless)

To see more information about a specific device, click the device name on **Devices** table to cross-launch or navigate to their respective controller **Inventory** details page.

The **End-of-life Devices** page also gives information on:

- Loading error: Displays a loading error if there are any issues with the controller, such as 401, 403, or if it is unreachable.
- Summary: Summary of EOL devices based on each device category.
- Analytics: Analytics shows the top five site groups and top device series, along with their individual counts.

  You can interact with site groups and device series by selecting and unselecting the filter and based on the devices that are listed in a table.

  For example: When a site group is selected from the **Top site groups** chart, the **Top device series** chart will highlight the device types associated with that selected site group. Conversely, selecting a device type from the **Top device series** chart will highlight the site groups in the **Top site groups** chart that include those device types.

  You can select filters from both the **Top site groups** and **Top device series** analytics sections simultaneously. The **Devices** table below will then show devices filtered by the the selected criteria, with active filters visually highlighted. The filters correspond to your selections for routers, switches, wireless devices, and accessories at the top. Unselecting a site group or device type selection from the analytics charts will clear the corresponding filter and update the **Devices** table accordingly.
- Devices: Displays a table of all devices, including device name, IP address, site, device type, device model, chassis + modules, accessories, last date of support, and next milestone, based on your selection. Additional data may be selected via table settings.

  You can edit the table settings.

  You can decide what to display or hide by adjusting the table settings for the **End-of-life Devices** page. Click the gear icon in the table header. The **Table settings** window appears. You can check or uncheck the items under **Table density** and **Table columns** as needed, then click **Apply**.

  Click on **Chassis+ modules** counts to view the EOL details for each hardware component, including accessories and software EOL data.

  Click the **Accessories** counts to view the EOL details for accessories components, such as fans and power supplies.

Click **Advanced** filter to do further filters based on the columns selected in the **Devices** table.

You can cross-launch to the Catalyst Center to view inventory information, alerts, and device end-of-life status.

# Endpoints

To view the endpoints, navigate to the Catalyst Center Global Manager dashboard and click **Endpoints**. Then the page loads data progressively as it receives information from the enrolled controllers.

Endpoints are also now available on the second-level page of the Catalyst Center Global Manager. You can access them from the endpoints dashlet on the **Overview** dashboard.

The **Endpoints** page provides additional health categories for both the wireless and wired endpoints, which include:

- Poor Health: Devices with a health score range from 1 to 3.
- Fair Health: Devices with a health score range from 4 to 7.
- No Health Data: Devices with no data.
- Good Health: Devices with a health score range from 8 to 10.

The **Endpoints** page also gives information for both the wireless and wired endpoints on:

- Loading error: Displays a loading error if there are any issues with the controller, such as 401, 403, or if it is unreachable.
- Analytics: Analytics shows the top site groups and top metrics.

To see more information about **Connected AP**, click the Access Point (AP) name on the **Endpoints** page for wireless endpoints. This action cross-launches to the corresponding controller's **Device 360** page for the specific AP page. Similarly, to see more information about **Connected Switch**, click the connected switch name on the **Endpoints** page for wired endpoints. This cross-launches to the related controller's **Device 360** page for that specific controller switch page.

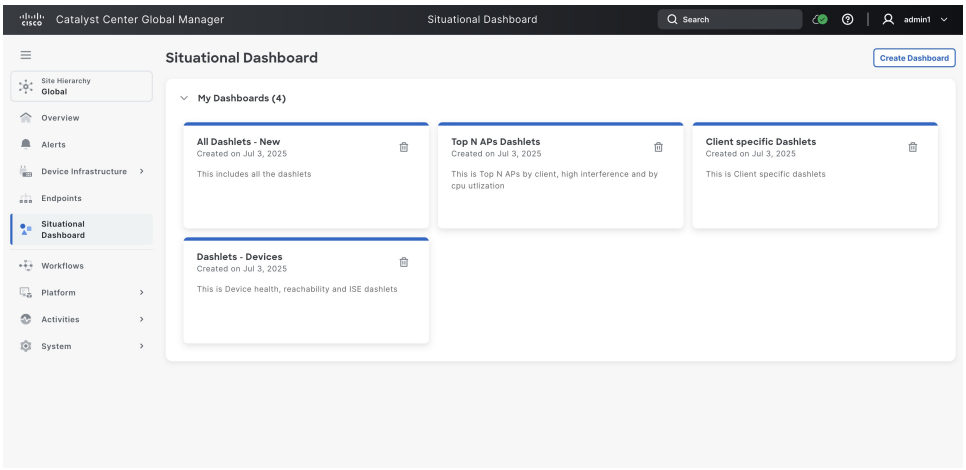
# Situational dashboard

A situational dashboard enables you to design custom pages using pre-built dashlets available in Catalyst Center Global Manager, based on your requirements. The dashboard provides aggregated views of client and device health, connectivity, and performance metrics.

You can select a maximum 15 dashlets on a single dashboard.

To view the situational dashboard, navigate to the Catalyst Center Global Manager dashboard and click **Situational Dashboard**. Then the page loads data progressively as it receives information from the enrolled controllers

The image here shows the situational dashboard page with different dashlets.




# Create a dashboard

### Procedure

**Step 1** From the Catalyst Center Global Manager dashboard, navigate to **Situational Dashboard** > **Create Dashboard** to create a customised page using the 32 available pre-defined dashlets.

The **Create New Dashboard** window appears.

**Step 2** Enter the **Dashboard Title**, and the **Description**. Then, choose the views you want to enable in your dashboard from the available dashlets. These dashlets display various widgets categorized into separate sections.

**Endpoint Performance**

- Endpoint onboarding times
- Endpoint roaming times
- Endpoint connectivity Received Signal Strength Indicator (RSSI)
- Endpoint connectivity Signal-to-Noise Ratio (SNR)
- Endpoint count per Service Set Identifier (SSID)
- Endpoint physical link connectivity
- Endpoint count per band

**Access Point Metrics**

- Top N Access Points (APs) by endpoint count

  Here, **N** refers to the number of APs displayed.
- Top N APs by high interference (2.4 Ghz)
- Top N APs by CPU utilization
- Total APs up/down

**Network Health**

- Device health count
- Total network reachability

**Network Services**

- Authentication, Authorization and Accounting (AAA)
  a. AAA transactions
  b. AAA summary
  c. AAA servers top transactions by WLC
  d. Top AAA latency sites
  e. Top AAA failure sites
- Dynamic Host Configuration Protocol (DHCP)
  a. DHCP transactions
  b. DHCP summary
  c. DHCP servers top transactions by device
  d. Top DHCP latency sites
  e. Top DHCP failure sites
- Domain Name System (DNS)
  a. DNS transactions
  b. DNS summary
  c. DNS servers top transactions by device
  d. Top DNS server latency
  e. Top DNS failure sites

**Power over Ethernet (PoE)**

a. Power usage
b. PoE powered device distribution
c. PoE operational state distribution

**Integrations**

- Identity Services Engine (ISE)

**Step 3** Click **Save**.

Your customised page appears as one of the dashboards you have created under **Situational Dashboards**.

**Note**

This dashboard is specific to your user account and is not visible to other users.

**Step 4** Click the page you have created to view aggregated data from multiple controllers.

**Note**

- Click **Refresh** to update the information displayed, ensuring you have the most current status.
- Select the dashlet and choose **Edit** to modify the dashboard. You can then toggle off the view from the list in a window to remove dashlets from the dashboard.
- You can switch between the created dashboard using the drop-down menu in the dashboard title's arrow icon.
- If you select the site under **Site Hierarchy**, the dashlets will reflect the specific site data.
- You can see the progressive loading on the **Situational Dashboard** page when the data loads. If an error occurs while fetching the data, an error alert appears on this page.
- You can use the selector drop-down to switch from the selected situational dashboard.

# Controllers

After the Catalyst Centers have been enrolled to Catalyst Center Global Manager, you can view all the Catalyst Centers on the **Controllers** page.

There are two ways to navigate to the **Controllers** page.

- From the **Overview** page, click on the controller health status.
- Alternatively, from the **System** > **Controllers** page.

Then select the controller name to view more detailed information.

**Note** The health status of the controller may take up to 10 minutes to be displayed.

The **Controllers** page displays these details:

**Note**

- **Controller**—Name of the Catalyst Center controller.
- When the controller is upgraded to the latest version, the **System version** column on the controller page will automatically display the new updated version.

Click one of the **Controller**s to view the controller details. The **Controller Details** window appears, and you can click any link to cross-launch to the controller page for further information.

The **Controller Details** include:

- **Controller name**: Shows the controller name, which is displayed as an IP address.

- By default, the controller name is populated during enrollment using the configured hostname, VIP address, management IP address, or Enterprise interface IP address for the Catalyst Center controller. However, you have the option to update the name to a customized one using the **Edit** feature on the controller page.

**Note**

- You can edit only the **Controller** name for enrolled controllers and the edited name is visible only on the **Controllers** page within the Catalyst Center Global Manager, and it will not propagate to the controller itself.

  The name will determine how the controller is labeled in Catalyst Center Global Manager, but it will not be reflected on the controller itself. This is strictly a GUI setting and does not affect the configuration of the controller. Additionally, this name will not be visible when you cross-launch to the controller.

  If you want to edit the controller, click one of the **Controller**s name that you want to edit. The **Controller Details** window is displayed. Click **Edit** and change the name of the controller and then save.

- All the fields are editable for the Pending controllers only.

- **View details**: Shows the cross-launch link to **System 360**.
- **IP Address**: Shows the IP addresses of all the controllers that have been added to Catalyst Center Global Manager.
- **Connectivity**: Shows whether the controllers are reachable or unreachable.
- **Health status**: Shows the health of all the controllers.
- **Description**: Shows the domain system certificate, an alert or a description of any system health event for all the controllers.
- **Type of controller**: Shows whether the controller is Catalyst Center.
- **Enterprise VIP**: Shows the virtual IP address of the controller.
- **Cluster configuration**: Shows whether the controller is single-node or 3-node.
- **System Version**: Shows the software versions running on Catalyst Centers.
- **Cloud Member ID**: Shows the Cloud member ID of the controller.
- **Last collected on**: Shows the controller details collected date.

**Note** You can edit the table settings.

You can decide what to display or hide by adjusting the table settings for the **Controllers** page. Click the gear icon in the table header. The **Table Settings** window appears. You can check or uncheck the items under **Table Density** and **Table Columns** as needed, then click **Apply**.

For information about adding and deleting a controller, see Enroll Catalyst Center to Catalyst Center Global Manager.

Once a controller is added to the controller page, it appears in the list as a "Pending connection" controller. You can edit any fields of a controller when it is in pending controller status.

**Pending controllers**

Once a controller is added to the controller page, it appears in the list as a **Pending connection** controller. Catalyst Center Global Manager helps you manage these controllers more efficiently. You can now easily identify pending connection controllers through new warning indicators. You can now select the **View pending controller(s)** option to filter the table, allowing you to focus exclusively on pending connections.

When a controller is in the **Pending connection** status, you now have the capability to edit all fields associated with a controller. If no modifications are made to the fields, the system enables the **Complete enrollment** option, which directs you to the Catalyst Center to complete the enrollment process. If changes are made to the fields, the **Save** button is enabled. You must save your changes before you can proceed with enrollment, or cancel the changes.

The system displays a direct pop-up alert to guide you during the edit process. The **You have unsaved changes** window is displayed as the system ensures that enrollment cannot be completed until the changes have been saved, preventing configuration errors.

# Cross-launch to controllers

The **Controllers** page displays various types of cross-launches in the **Controller Details** for each controller. These include system 360, system health, and software management.

Cross-launch is available from all pages within the Catalyst Center Global Manager. With a single login to the Catalyst Center Global Manager, you can access all registered controllers without the need to log in again.

## System 360

The **System 360** provides detailed information about the app stacks and services running on the selected Catalyst Center. You can use this information to assist in troubleshooting issues with specific applications or services.

**Procedure**

**Step 1** In the **Controllers** page, click one of the controllers.

The **Controller Details** window is displayed.

**Step 2** Click **System 360** to view the details.

A new window opens from the Catalyst Center Global Manager dashboard after cross-launching to a specific page of the selected controller.

**Note**
For cross-launch to function properly for an enrolled Catalyst Center, the same users in Catalyst Center Global Manager must exist in all the controllers managed by Catalyst Center Global Manager.

## System health

The **System Health** provides detailed information about the health of the selected Catalyst Center from the **Controllers** page.

When you click **System Health** in the **Controller Details** window of the selected controller, the system cross-launches to the corresponding Catalyst Center page.

## Software management

The **Software Management** displays the available installed applications or system updates of the selected Catalyst Center from the **Overview** page.

When you click **Software Management** in the **Controller Details** window of the selected controller on the **Overview** page, the system cross-launches to the corresponding controller page.

# Controller backup

A **Controller backup** is a feature that provides a centralized, aggregate view of your environment, allowing you to monitor statuses, troubleshoot failures, and manage backup configurations or schedules.

**Note** The **Controller backup** page displays enrolled controllers only; pending controllers are not shown.

After the Catalyst Centers have been enrolled to Catalyst Center Global Manager, you can monitor the backup status of all enrolled controllers on the **Controller backup** page.

To view the backup status of all enrolled controllers, navigate to **System** > **Controller backup** page.

Key features are:

- Centralized monitoring: View the backup status of all enrolled controllers in one location.
- Status-based filtering: Filter controllers by their current backup state, including Failed, Not configured, No backup data, In progress, and Success. The **Last backup status** displays only Success, Failed, or In progress, and excluding secondary statuses such as Canceled or Deleting.
- Progressive loading: Displays data as controllers respond, ensuring you receive updates as they become available.
- Error reporting: View detailed error reports in the loading error list for any controllers that fail to retrieve the backup details.
- Cross-launch capabilities: Easily navigate to specific controller interfaces to perform advanced management tasks, such as configuring backups, restoring selected backups, and deleting or canceling any backup.

By default, the table displays all controllers and their backup status details sorted by **Last backup status** column. You can add optional table columns, such as **Scheduled scope** through the **Table settings**.

**Monitoring and filtering**

- **Status cards**: Select a status card (Failed, Not configured, No backup data, In progress, or Success) to filter the list of controllers.
- **Reset filters**: Click **Reset Filters** to clear all active filters and display the full list of controllers.

- **Loading errors**: Click **Loading error** to view details regarding controllers that failed to load.

**Troubleshooting failures**

If a controller status has failed, perform the following steps to investigate:

1. Click the controller name to view specific failure details.
2. Click **Learn more** to cross-launch the controller **Backup & Restore** page, where you can review connectivity status, backup names, and historical attempt data.

**Note** For a failed backup status, the "Learn more" option will be available to cross-launch to the controller for troubleshooting.

**Managing backup configurations and schedules**

- **Configure backups**: If a controller backup is not configured, follow these steps:
  - Click the **Configure backup** link located in the **Last backup status** column of the table directly, or
  - Click the controller name on the table first, then click **Configure backup** link in the **Last backup status** column.

  This action will cross-launch you to the controller **Backup Configuration** page, where you can set up the backup settings, including specifying the backup path (NFS, physical disk, or SSH (Remote Server)).
- **View backup details**: Click controller name in the table, then click **Backup details** to view the controller backup details.

  To access advanced backup details, click **Backup details** link which will cross-launch to Catalyst Center to view the backup history and their advanced actions such as backup & restore, schedule backup or delete.
- **Schedule backups**: Select one or more controllers using the checkboxes and click **Schedule backup** to schedule the backups. You can update the backup name, schedule type, and data scope of one or more controllers.

**Note** For VA-based controllers, any new backup schedule will overwrite the existing one. However, for on-premises controllers, if a backup schedule already exists, it must first be deleted from the controller through cross-launch before scheduling a new backup from the Catalyst Center Global Manager.

- **Additional actions**: Click the **(...)** icon in the table to cross-launch to the respective Catalyst Center to perform these actions:
  - Backup & Restore: For restore or delete backups.
  - Backup configuration: For any non-configured or new backups.

**Note**

- **Time zone**: All timestamps are converted to UTC to ensure consistency across controllers.
- **Platform-specific configurations**:
  - **On-premises controllers**: Catalyst Center Global Manager supports configurations for both remote hosts and NFS servers.

    **Limitations of On-premises controllers**

    - The controller backup details, including last backup scope, scheduled scope, retained backups, and available space, are marked as N/A. This is because the specific APIs do not provide this data, although it is available in the Catalyst Center.
    - You cannot edit a backup schedule that already exists on the controller. An error message appears prompting you to delete the existing schedule before creating a new one.
    - The backup names on the Catalyst Centers must meet these requirements:
      - Contain only: Lowercase letters (a-z), numbers (0-9), hyphens (-), or periods (.).
      - Start and end with: A lowercase letter or a number.

    The Catalyst Center Global Manager will convert the provided backup name into a compatible controller name that is accepted by the on-premises-based controller during scheduling.
  - **VA-based controllers**: The interface displays information about the physical disk, NFS server, and SSH (Remote Server), and the destination path.

# Global search

The global search box is available on the Catalyst Center Global Manager home page. It supports searches based on MAC address, platform, software version, and IP address. You can use it to search for these categories:

- Devices
- Endpoints
- Applications
- Sites
- Users

For instance, from the Catalyst Center Global Manager home page, click the global search bar at the top right to search for devices, endpoints, and so on. You can enter or type the hostname strings of the devices to search across the controllers.

You do not need to enter the complete hostname. For example, type **Core** to view all devices with **Core** in their names. Then, click on **More results...** to expand the list of devices. After that, select any device from the list to access more detailed information. Press the **Return** or **Enter** key to initiate the search, because the autosearch feature is not supported. The matching search results appear on the left panel.

Click **Device 360**. The **Cross Launch** dialog box appears. Then click **Confirm** to go to the device 360 page for that device from the controller where the core-01 devices are located.

You can do the same thing for other search categories: Enter the name or IP address of the client to get a list of network devices or clients with that name.

Click one of the clients to go to the **Client 360** page of the client in the controller.

**Note** In addition to the cross-launch feature, global search provides various functionalities, including viewing the device name, serial number, connected Catalyst Center or controller, version number, and more. This applies to applications, endpoints, and other elements as well.

# Workflows

Catalyst Center Global Manager provides support to trigger notifications when certain events occur. You can choose your preferred method of receiving event notifications. The notification channels supported are:

- **EMAIL**: Send an email notification.
- **PAGERDUTY**: Post event notifications to PagerDuty.
- **REST**: Send data via HTTP push API.
- **SNMP**: Send data via an SNMP trap.
- **SYSLOG**: Send data to a Syslog server.
- **WEBEX**: Post event notifications to Webex.

# Platform

Catalyst Center Global Manager provides an extensible platform that Cisco customers and partners can use to create value-added applications that can be built on top of its native capabilities. You can leverage the platform features to enhance the overall network experience by optimizing end-to-end IT processes, reducing the Total Cost of Ownership (TCO), and developing new value networks:

- Intent APIs: The Intent APIs are northbound REST APIs that expose specific capabilities of Catalyst Center Global Manager platform. The Intent APIs provide policy-based abstraction of business intent, allowing you to focus on an outcome to achieve instead of struggling with the mechanisms that implement that outcome. The APIs conform to the REST API architectural style. The APIs are simple, extensible, secure to use, and support the standard REST methods, which include the GET, POST, PUT, and DELETE operations through HTTPS.
- Integration Flows: Integration capabilities are part of westbound interfaces. To meet the need to scale and accelerate operations in modern data centers, IT operators require intelligent, end-to-end work flows built with open APIs.
- Events and Notifications Services: Supported services are available for Catalyst Center Global Manager events.

# Overview

To access the **Platform** window, navigate to the Catalyst Center Global Manager dashboard and click **Platform** > **Overview**.

The platform **Overview** window supports these features:

- Displays brief summaries and direct links to the Catalyst Center Global Manager platform GUI features, including:
  - **Bundles**: Provides access to bundles that you can use to integrate your own applications to Catalyst Center Global Manager with or to enhance the performance of Catalyst Center Global Manager itself. Bundles are defined as groupings of APIs, events, integration flows, data services, or applications. Additionally, provides access to a GUI (**Configurations**) where you can configure general or event global settings or settings for multiple bundles.
  - **Developer Toolkit**: Provides tools (APIs and integration flows) for accessing Catalyst Center Global Manager and integrating Catalyst Center Global Manager with other applications.
- Accesses the **Notifications** slide-in pane that presents any current Catalyst Center Global Manager platform notifications, including bundle updates. Click **View Details** to view detailed data about the bundle under the **Bundles** tab. Click **Dismiss** to dismiss the bundle notification.

# Manage

The Catalyst Center Global Manager platform **Manage** window provides access to these features:

To access the **Manage** window, navigate to the Catalyst Center Global Manager dashboard and click **Platform** > **Manage**.

- **Bundles**: Access to bundles that you can use to integrate Catalyst Center Global Manager with your own applications or to enhance the performance of Catalyst Center Global Manager itself. Bundles are comprised of groupings of APIs, events, data services, or applications.

## Bundles

Catalyst Center Global Manager platform provides access to bundles that you can use to integrate Catalyst Center Global Manager with your own applications or to enhance the performance of Catalyst Center Global Manager itself.

This Catalyst Center Global Manager platform information is accessible using the GUI:

- Bundle name, vendor, version, version release date, tags, and description.
- Status of the bundle:
  - **NEW**: Bundle that is available through Catalyst Center Global Manager platform, but has not yet been enabled. Click **Enable** to enable the bundle for configuration and subsequent activation.
  - **ENABLED**: Bundle that has been enabled, but not yet configured. Once enabled, the bundle's API code can be viewed under the **Contents** tab. Click **Configure** to configure at the bundle level.

    The enablement and configuration of bundles are two separate steps, because a business manager will usually enable a particular bundle as a business decision. The follow-up configuration of the bundle will usually be performed by an IT or network administrator.

- **DISABLED**: The bundle has been stopped from executing any further.
- **ACTIVE**: After either reviewing and/or configuring the bundle (configuring bundle-specific values), you can activate the bundle in your network by clicking **Activate**.
- **UPDATE**: When you upgrade from one version of Catalyst Center Global Manager platform to a later version of Catalyst Center Global Manager platform.
- **ERROR**: There is an issue with the bundle and it cannot be activated within your network.

# Developer toolkit

The Catalyst Center Global Manager platform provides you with these software developer tools to access and program with Catalyst Center Global Manager, as well as to integrate Catalyst Center Global Manager with other applications:

- **APIs**: Available APIs organized within categories by functionality (for example, **Operational Tasks** or **Site Management** APIs).
- **Event Notifications**: Lets you view and subscribe to specific events that may occur in your network.

To view the developer toolkit, navigate to the Catalyst Center Global Manager dashboard and click **Platform** > **Developer Toolkit**.

This toolkit provides a new set of intent APIs:

- Authentication
- Event Management
- Know Your Network
- Site Management
- System

For more information on these APIs, see or download the **Swagger docs** from the **APIs** GUI.

# Activities

The **Activities** page allows you to view the audit log details of Catalyst Center Global Manager.

To view the audit logs, navigate to the Catalyst Center Global Manager dashboard and click **Activities** > **Audit Logs**.

Audit logs in Catalyst Center Global Manager capture detailed information about various activities and events within the system performed by the logged in user, system-level changes such as user login options, controller operation initiated from the Catalyst Center Global Manager, and controller connectivity status.

It provides these details:

- Created date and time
- Description

- Category
- Severity
- User

**Note**

- You can refine the search summary for these periods:
  - last 2 weeks
  - last 7 days
  - last 24 hours
  - last 3 hours
  - by date
- You can also enhance the search summary by categorizing it according to different severity levels:
  - critical
  - warning
  - info

The Catalyst Center Global Manager audits these operations:

- All user logins.
- Catalyst Center Global Manager operations such as:
  - backup and restore
  - upgrade
  - create user
  - configure AAA Server
  - enroll or unenroll controller
  - controller connectivity status change (reachable or unreachable)
- Controller operations initiated from Catalyst Center Global Manager.

# System

The **System** page allows you to view these basic details of Catalyst Center Global Manager.

# Use System 360

The **System 360** tab provides at-a-glance information about Catalyst Center Global Manager.

### Procedure

**Step 1** From the main menu, choose **System** > **System 360**.

**Step 2** On the **System 360** dashboard, review these displayed data metrics:

The **System 360** GUI offers a view of cluster-level services under hosts and allows monitoring of services through cluster tools. It also provides system management operations such as software management and information about backups.

**Cluster**

- **Hosts**: Displays information about the Catalyst Center Global Manager hosts. The displayed information includes the hosts IP addresses and detailed data about the services running on the host. Click the **View Services** link to view detailed data about the services running on the hosts.

  **Note**
  The host IP address has a color badge next to it. A green badge indicates that the host is healthy. A red badge indicates that the host is unhealthy.

  The side panel displays these information:

  - **Node Status**: Displays the health status of the node.

    If the node health is unhealthy, hover over the status to view additional information for troubleshooting.

  - **Services Status**: Displays the health status of the services. Even if one service is down, the status is **Unhealthy**.
  - **Name**: Service name.
  - **Appstack**: App stack name.

    An app stack is a loosely coupled collection of services. In this environment, a service is a horizontally scalable application that adds instances when demand increases and removes instances when demand decreases.

  - **Health**: Status of the service.
  - **Version**: Version of the service.
  - **Tools**: Displays metrics and logs for the service. Click the **Metrics** link to view service monitoring data in Grafana. Grafana is an open-source metric analytics and visualization suite. You can troubleshoot issues by reviewing the service monitoring data. For information about Grafana, see https://grafana.com/. Click the **Logs** link to view service logs in Kibana. Kibana is an open-source analytics and visualization platform. You can troubleshoot issues by reviewing the service logs. For information about Kibana, see https://www.elastic.co/products/kibana.

- **Cluster Tools**: Lets you access only the monitoring tool.

  - **Monitoring**: Access multiple dashboards of Catalyst Center Global Manager components using Grafana, which is an open-source metric analytics and visualization suite. Use the **Monitoring** tool to review and analyze key Catalyst Center Global Manager metrics, such as memory and CPU usage. For information about Grafana, see https://grafana.com/.

    **Note**

In a multihost Catalyst Center Global Manager environment, expect duplication in the Grafana data due to the multiple hosts.

**System Management**

- **Software Management**: Displays the status of application or system updates.

  Click **View Installed Applications** or **View Release Activities** to view the update details.

  **Note**
  An update has a color badge next to it. A green badge indicates that the update or actions related to the update succeeded. A yellow badge indicates that there is an available update.

- **Backup & Restore**: Displays the status of the most recent backup. Catalyst Center Global Manager supports configuring backups using Network File System (NFS), physical disk, or SSH (Remote Server) as backup storage options within the backup configuration settings. It schedules a backup with 2 options: **Now** or **Daily**.

  **Note**
  A backup has a color badge next to it. A green badge indicates a successful backup with a timestamp. A yellow badge indicates that the next backup is not yet scheduled.

  Click **Configure Settings** to configure backup settings, including adding or updating NFS configurations for storing backups. Additionally, you can restore the system using these backups through the interface.

**Step 3** Click **System Health** to view detailed information about the health and topology of Catalyst Center Global Manager and lets you run the validation tool for Catalyst Center Global Manager.

On the **System Health** topology view, click one of the nodes of the Catalyst Centers to view details which will list the **Controller Details** similar to the **Controller Details** on the **Controllers** page:

- Controller name
- View details
- IP address of controller
- Connectivity
- Health status
- Description
- Type of controller
- Enterprise VIP
- Cluster configuration
- Node hostname
- Node health
- Node serial number
- System Version
- Cloud Member ID

- Last collected on

On the **System Health** page, choose **Validation Tool** from the **Tools** drop-down to view the validation runs and status. The validation tool provides these information:

- Name
- Description
- Selected set(s)
- Status
- Start time
- Duration
- Actions

A validation tool is provided to you to assess the system health of Catalyst Center Global Manager, which can be run on demand. The tool is divided into two sections: 'infra' and 'upgrade,' each containing its own specific set of validations. These validations are provided to you as part of the Catalyst Center Global Manager release.

Additionally, the same validations are uploaded to the validation catalog. To update your validation set, navigate to **System** > **Settings** > **System Health** to download and import the latest set of validations.

Click **Refresh** to view the displayed health status of your network devices and components. This ensures that you are viewing the most current information regarding the health and performance of your system.

# Software Management

The Catalyst Center Global Manager provides many of its functions as individual applications, packaged separately from the core infrastructure. This enables you to view installed applications or system updates and uninstall those you are not using, depending on your preferences.

The number and type of application packages shown in the **Software Management** window vary depending on your Catalyst Center Global Manager release and your Catalyst Center Global Manager licensing level. All the application packages that are available to you are shown, whether or not they are currently installed.

Some applications are basic that they are required on nearly every Catalyst Center Global Manager deployment.

Each Catalyst Center Global Manager application package consists of service bundles, metadata files, and scripts.

The **Software Management** page provides you a view of these details.

- **Installed applications**

  To view the description of a package, click the **View Installed Applications** and place your cursor over its name.

- **Upgrade summary report**

  Click the **View Upgrade Summary** to view the results of the latest upgrade of Catalyst Center Global Manager and its applications. This report allows you to:

- Identify the current and previous Catalyst Center Global Manager version that was installed on your appliance.
- Determine when the upgrade took place.
- In the **Activity** tab, view the application packages that were upgraded and their current version number.
- In the **Timeline** tab, see whether the post-upgrade checks performed by Catalyst Center Global Manager were completed successfully.

- **Release activities**

  Click the **View Release Activities** to view all installed applications that are in progress, success, or failed state.

# About backup and restore

The backup and restore functions enable you to create backup files and restore them on a different appliance if necessary for your network configuration.

### Backup

- You can back up Catalyst Center Global Manager data only.
- Catalyst Center Global Manager backup consists of database backups which includes:
  - All the enrolled controllers
  - Users and roles
  - Situational dashboards created by the users
  - All the system settings saved by the users
  - Device health export file

**Important** Do not modify or delete the backup files. If you do, you might not be able to restore the backup files to Catalyst Center Global Manager.

- Catalyst Center Global Manager creates the backup files and posts them to a remote server. Each backup is uniquely stored using the UUID as the directory name. For information about the remote server requirements, see Backup server requirements.
- Only a single backup can be performed at a time. Performing multiple backups at once is not supported.
- When a backup is being performed, you cannot delete the files that have been uploaded to the file service, and changes that you make to these files might not be captured by the backup process.
- Options available are:
  - Perform a daily backup to maintain a current version of your database and files.

- Perform a backup after making changes to your configuration. For example, when changing or creating a new policy on a device.
- Perform a backup only during a low-impact or maintenance period.

- You can schedule weekly backups on a specific day of the week and time.

### Restore

- You can restore the backup files from the remote server using Catalyst Center Global Manager.
- When you restore the backup files, Catalyst Center Global Manager removes and replaces the existing database and files with the backup database and files. While a restore is being performed, Catalyst Center Global Manager is unavailable.
- You can restore a backup to a Catalyst Center Global Manager with a different IP address. This situation could happen if the IP address is changed on Catalyst Center Global Manager and you need to restore from an older system.

## Backup server requirements

The backup server must run one of the supported operating systems:

- Red Hat Enterprise 8 or later
- Ubuntu 16.04 (or Mint, etc) or later

### Server requirements for data backup

To support data backups, the server must meet these requirements:

- Must use SSH (port22)/remote sync (rsync). Catalyst Center Global Manager does not support using FTP (port 21) when performing a backup.
- The Linux rsync utility must be installed.
- The C.UTF-8 locale must be installed. To confirm whether C.UTF-8 is installed, enter:

```
# localectl  list-locales | grep -i c.utf
C.utf8
en_SC.utf8
```

- The backup user must own the destination folder for the backup or have read-write permissions for the user's group. For example, assuming the backup user is *backup* and the user's group is *staff*, this sample outputs show the required permissions for the backup directory:
  - Example 1: Backup directory is owned by *backup* user:

    ```
    $ ls -l  /srv/
    drwxr-xr-x  4 backup     root  4096 Apr 10 15:57 acme
    ```

  - Example 2: *backup* user's group has required permissions:

    ```
    $ ls -l  /srv/
    drwxrwxr-x. 7 root   staff  4096 Jul 24  2017 acme
    ```

- SFTP subsystem must be enabled. The SFTP subsystem path depends on which Ubuntu or Red Hat release is installed. For the latest release, these lines below must be uncommented and present in the SSHD configuration:
  - Ubuntu-based Linux: `Subsystem sftp /usr/lib/openssh/sftp-server`
  - Red Hat-based Linux: `Subsystem sftp /usr/libexec/openssh/sftp-server`

  The file where you need to uncomment the preceding line is usually located in `/etc/ssh/sshd_config`.

**Note** You cannot use an NFS-mounted directory as the Catalyst Center Global Manager backup server directory. A cascaded NFS mount adds a layer of latency and is therefore not supported.

#### Requirements for multiple Catalyst Center Global Manager deployments

If your network includes multiple Catalyst Center Global Manager clusters, you cannot use the same backup location. For multiple Catalyst Center Global Manager deployments, the best practice is to separate the backup directory structure for each Catalyst Center Global Manager cluster. This example configuration shows how to separate your backup directory structure.

| Resource | Example configuration |
|---|---|
| Catalyst Center Global Manager clusters | 1. *cluster1*<br>2. *cluster2* |
| Backup server hosting backups | The example directory is `/data/`, which has ample space to host the Catalyst Center Global Manager backups. |
| Directory ownership and permissions | Earlier in this section, see "Server Requirements for Data Backup." |
| NFS export configuration | The content of the `/etc/exports` file:<br>`/data/cluster1 *(rw,sync,no_subtree_check,all_squash)` |

## Backup storage requirements

Catalyst Center Global Manager stores backup copies of data on an external NFS device on an external target location. Refer to Backup to view the types of database backups.

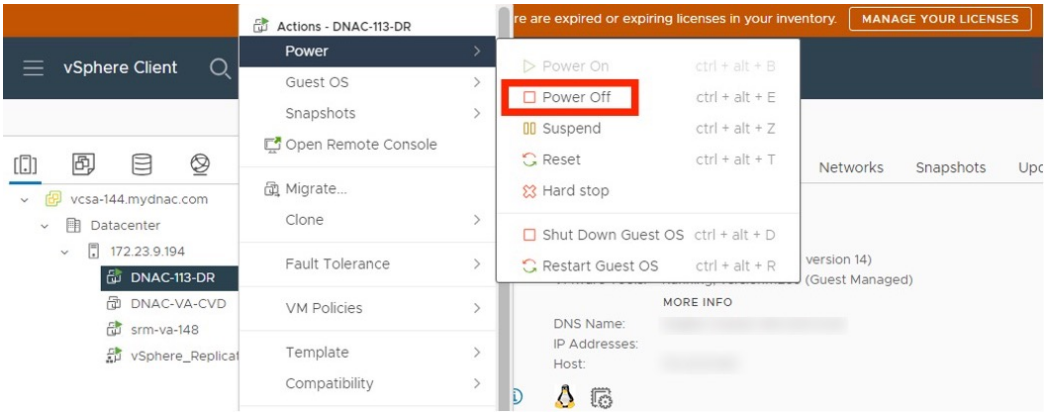
You must allocate enough external storage for your backups to cover the required retention. We recommend that the daily NFS storage backup size be limited to a maximum of 1 GB, with a maximum retention capacity of 60 GB for disk backups.

## Add a physical disk for backup and restore

Use this procedure to add a physical disk that can be used for only Catalyst Center Global Manager on ESXi backup and restore operations.

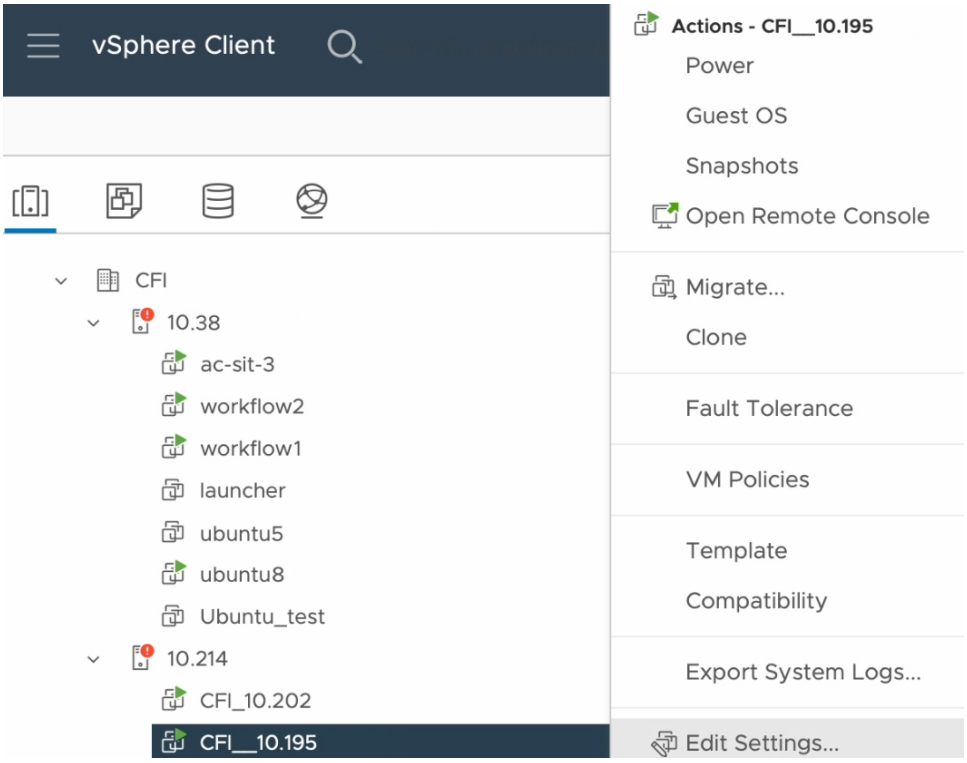
### Procedure

**Step 1** If your appliance is running on the machine that's hosting Catalyst Center Global Manager on ESXi, power off the appliance's virtual machine.

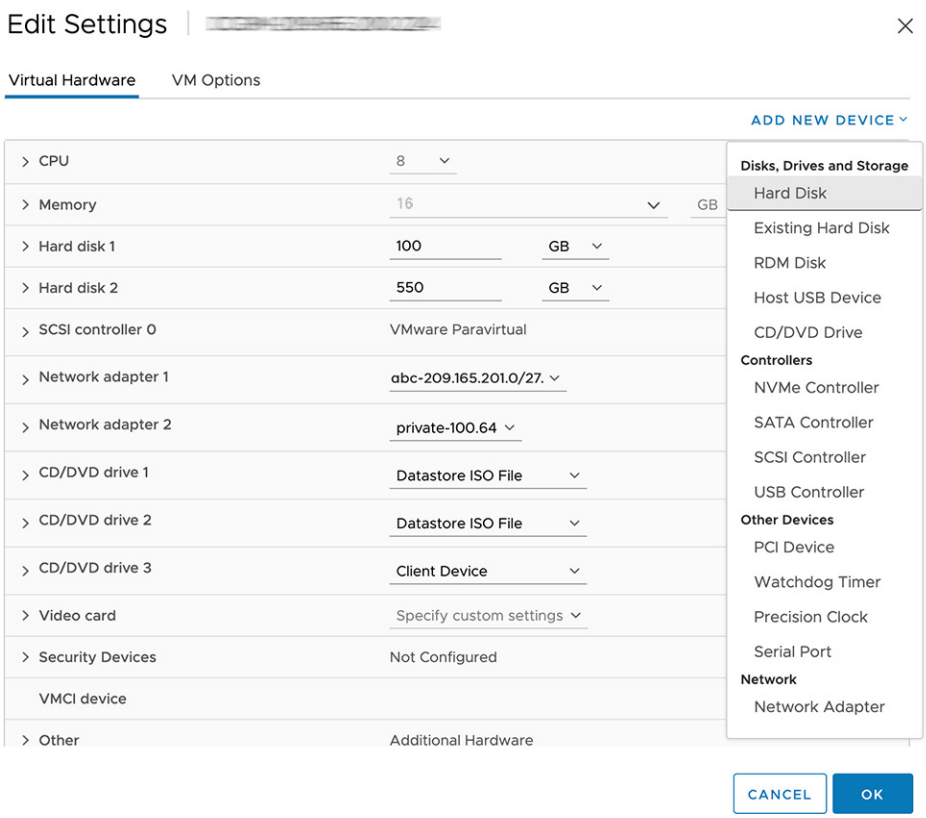



**Step 2** Log in to VMware vSphere.

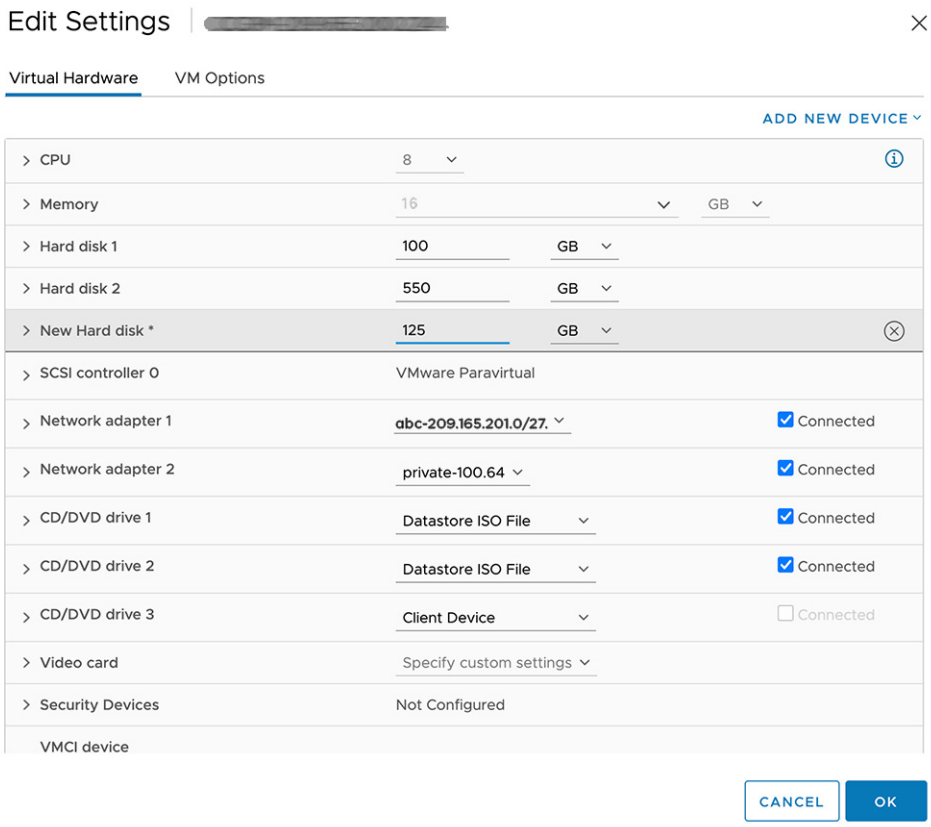
**Step 3** From the vSphere client left pane, right-click the ESXi host and then choose **Edit Settings**.




**Step 4** In the **Edit Settings** dialog box, click **Add New Device** and then choose **Hard Disk**.



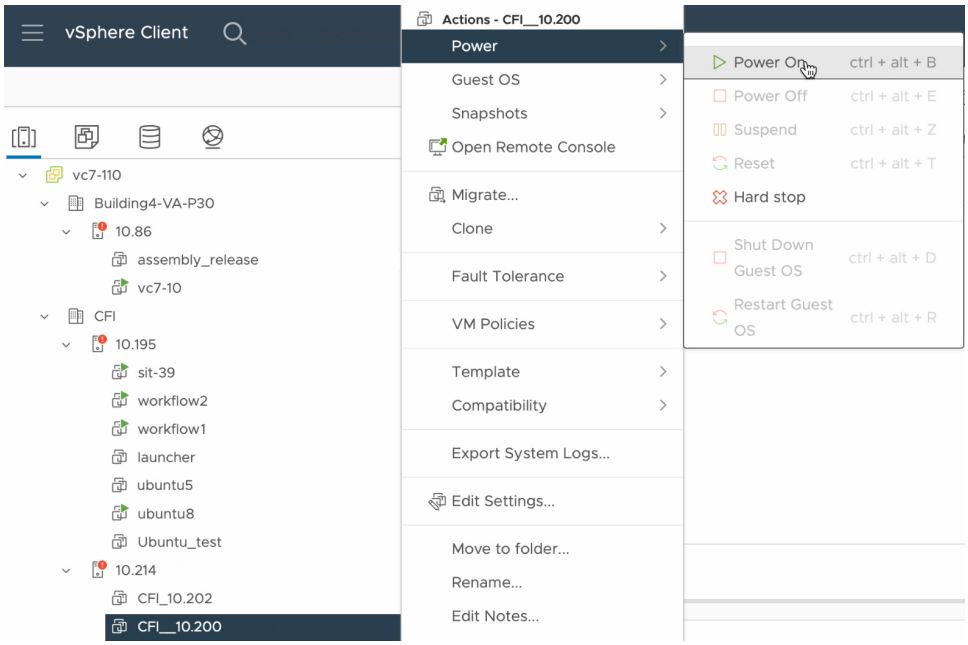

**Step 5** In the **New Hard disk** field, enter the desired storage size.




**Note**
For information on the recommended storage space for backup, see Backup storage requirements.

**Step 6** Click **OK**.

**Step 7** Power on the appliance's virtual machine.




### What to do next

You can now configure the added physical disk for backup. For information on how to configure the physical disk, see Configure the location to store backup files.

## Add the NFS server

Catalyst Center Global Manager allows you to add multiple Network File System (NFS) servers for backup purposes. Use this procedure to add an NFS server that can be used for the backup operation.

### Procedure

**Step 1** From the main menu, choose **System** > **Settings** > **System Configuration** > **Backup Configuration**.

Alternatively, choose **System** > **Backup and Restore** > **Configure Settings**.

**Step 2** Click **Add NFS**.

**Step 3** In the **Add NFS** slide-in pane, complete these steps:

a) Enter the **Server Host** and **Source Path** in the respective fields.
b) Choose **NFS Version** from the drop-down list.
c) The **Port** is added by default. You can leave the field empty.
d) (Optional) Enter the **Port Mapper** number.
e) Click **Save**.

**Step 4** Click **View NFS List** to view the available NFS servers.

The **NFS** slide-in pane displays the list of NFS servers, along with details.

**Step 5** In the **NFS** slide-in pane, click the ellipsis under **Actions** to **Delete** the NFS server.

**Note**
You can delete the NFS server only when there is no backup job in progress.

### What to do next

Configure the added NFS server for backup. For more information, see Configure the location to store backup files.

## Add a remote SSH server

Use this procedure to configure a remote server for backups.

### Procedure

**Step 1** From the main menu, choose **System** > **Settings** > **System Configuration** > **Backup Configuration**.

Alternatively, choose **System** > **Backup and Restore** > **Configure Settings**.

**Step 2** On the **Backup Configuration** page, select **SSH (Remote Server)**, and then click **Add SSH**.

**Step 3** In the **Add SSH** slide-in pane, enter the remote SSH server details, and then click **Save**.

a) In the **SSH IP Address** field, enter the IP address of the server.
b) In the **SSH Port** field, enter the SSH port number.
c) In the **Username** field, enter the user name for the server.
d) In the **Password** field, enter the password for the server.
e) In the **Server Path** field, enter the backup directory path.

**Step 4** On the **Backup Configuration** page, click **View SSH List** to confirm the server is successfully added.

The **SSH List** slide-in pane displays the added server and its details.

**Step 5** On the **Backup Configuration** page, configure the server path for backup storage:

a) Click **Refresh**.
b) From the **Server Path** drop-down list, choose the server path.
c) Click **Submit**.

The remote SSH server is configured and available for backups.

## Configure the location to store backup files

Use this procedure to configure the storage location for backup files.

### Before you begin

Make sure that these requirements are met:

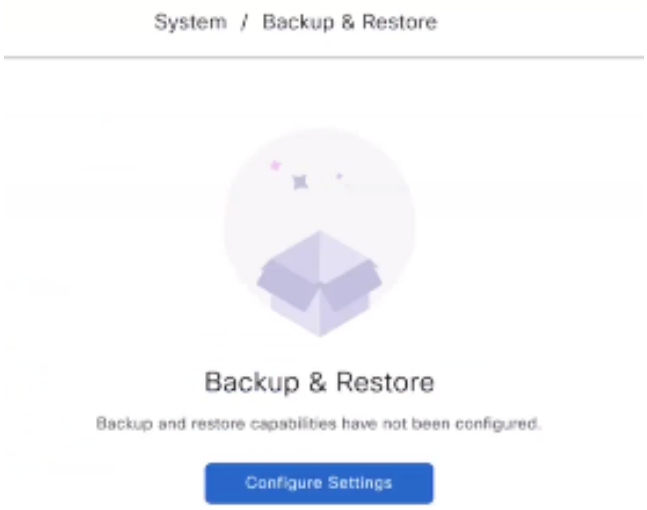
- Only a user with SUPER-ADMIN-ROLE permissions can perform this procedure.

- The data backup server must meet the requirements described in Backup server requirements.

### Procedure

**Step 1** From the main menu, choose **System** > **Backup and Restore**.

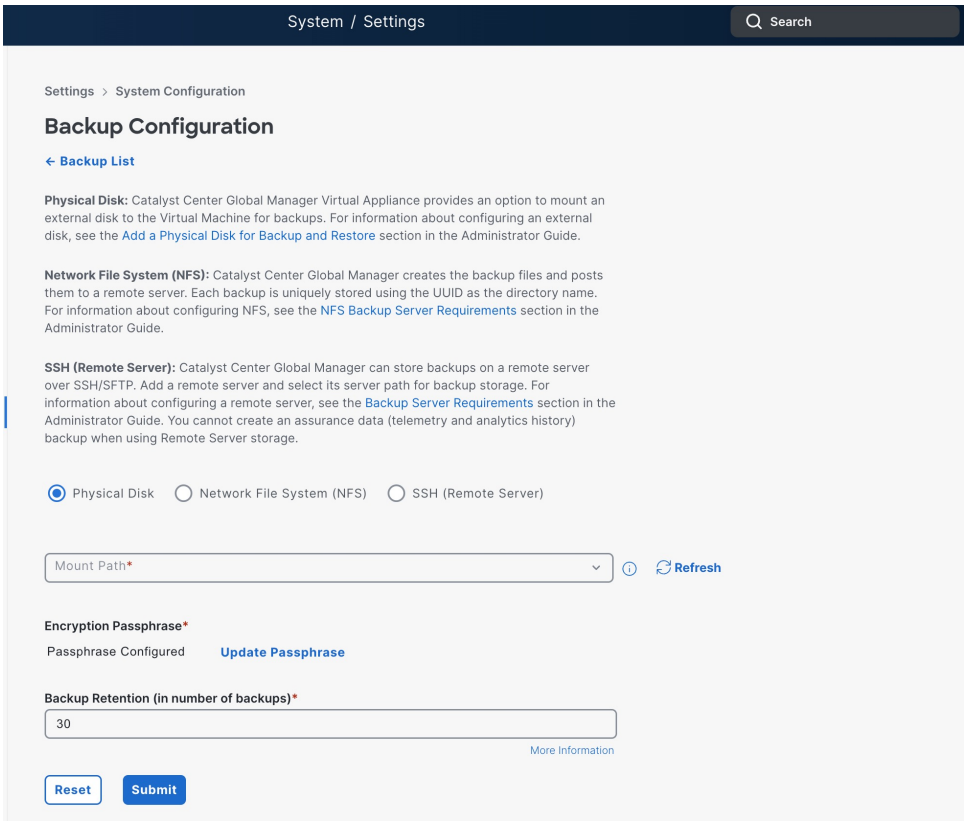
You can view this window:




**Step 2** Click **Configure Settings**.

Alternatively, choose **System** > **Settings** > **System Configuration** > **Backup Configuration**.

**Step 3** Choose the **Physical Disk** or **NFS** server or **SSH (Remote Server)** option.




**Step 4** **Physical Disk**: Catalyst Center Global Manager provides an option to mount an external disk to the virtual machine, to store a backup copy of data. To configure a physical disk, click the **Physical Disk** radio button and define these settings:

**Note**
The physical disk option is only supported for single-node virtual machines.

| Field | Description |
|---|---|
| Mount Path | Location of the external disk. |
| Encryption Passphrase | Passphrase used to encrypt the security-sensitive components of the backup. These security-sensitive components include certificates and credentials.<br>This passphrase is required, and you will be prompted to enter this passphrase when restoring the backup files. Without this passphrase, backup files are not restored.<br>After the passphrase is configured, if you want to change the passphrase, click **Update Passphrase**. |
| Backup Retention | Number of backups for which the data is retained.<br>Data older than the specified number of backups is deleted. |

**Step 5** **NFS**: Catalyst Center Global Manager creates the backup files and posts them to a remote NFS server. For information about the remote server requirements, see Backup server requirements. To configure an NFS backup server, click the **NFS** radio button and define these settings:

| Field | Description |
|---|---|
| Mount Path | Location of the remote server. |
| Encryption Passphrase | Passphrase used to encrypt the security-sensitive components of the backup. These security-sensitive components include certificates and credentials.<br>This passphrase is required, and you will be prompted to enter this passphrase when restoring the backup files. Without this passphrase, backup files are not restored.<br>After the passphrase is configured, if you want to change the passphrase, click **Update Passphrase**. |
| Backup Retention | Number of backups for which the data is retained.<br>Data older than the specified number of backups is deleted. |

**Step 6** **SSH (Remote Server)**: Catalyst Center Global Manager can store backups on a remote server over SSH/SFTP. Add a remote server and select its server path for backup storage. For information about configuring a remote server, see the Backup server requirements. To configure the SSH backup server, click the **SSH (Remote Server)** radio button.

**Step 7** Click **Submit**.

After the request is submitted, you can view the configured physical disk or NFS server or SSH (Remote Server) under **System** > **Backup & Restore**.

## Create a backup

Use this procedure to create a backup of your Catalyst Center Global Manager.

### Before you begin

You must configure the backup location. For more information, see Configure the location to store backup files.

### Procedure

**Step 1** From the main menu, choose **System** > **Backup & Restore**.

**Step 2** Click **Schedule Backup**.

The **Schedule Backup** slide-in pane opens.

Complete these steps in the **Schedule Backup** slide-in pane:

**a.** Enter a unique name for the backup.

**b.** In the **Schedule Type** area, choose one of these options:

- **Backup now**: To immediately create a backup.
- **Schedule backup daily**: To schedule the backup on a daily basis.
- **Schedule backup weekly**: To schedule the backup on a weekly basis.

**c.** Click **Save**.

**Step 3** Catalyst Center Global Manager begins the backup process. An entry for the backup is added to the **Backup & Restore** window.

When the backup is complete, its status changes from `Creating` to `Success`.

## Schedule data backup

You can schedule recurring backups and define the day of the week and the time of day when they will occur.

### Before you begin

Make sure that these requirements are met:

- Only a user with SUPER-ADMIN-ROLE permissions can perform this procedure.
- The data backup server must meet the requirements described in Backup server requirements.
- Backup servers have been configured in Catalyst Center. For more information, see Configure the location to store backup files.

### Procedure

**Step 1** From the main menu, choose **System** > **Backup & Restore**.
The **Backup & Restore** window is displayed.

**Step 2** Click **Schedule Backup**.

**Note**
You can schedule a new backup only when there is no backup job in progress.

**Step 3** In the **Schedule Backup** slide-in pane, complete these steps:

**a.** In the **Backup Name** field, enter a unique name for the backup.

**b.** Choose a schedule option:

- **Schedule backup daily**: To schedule a daily backup job, choose the time of day when you want the backup to occur.
- **Schedule backup weekly**: To schedule a weekly backup job, choose the days of the week and time of day when you want the backup to occur.

**c.** Click **Save**.

The **Backup & Restore** window displays a banner message that shows the day and time for which the backup is scheduled.

**Step 4** (Optional) Click **View Upcoming Backups** to make any changes to the upcoming schedules. If you don't want the backup to occur on a scheduled date and time, in the **Upcoming Schedules** slide-in pane, click the toggle button to disable a particular schedule.

**Step 5** (Optional) Click **Edit Schedule** to edit the schedule.

**Step 6** (Optional) Click **Delete Schedule** to delete the schedule.

**Step 7** After the backup starts, it appears in the **Backup & Restore** window. Click the backup name to view the lists of steps executed.

Alternatively, you can click **View Activities** at the top left of the **Backup & Restore** window and click the **Execution ID**. The **Create Backup Details** slide-in pane opens and shows the list of steps executed.

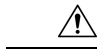
**Step 8** In the **Backup & Restore** window, click the **In Progress**, **Success**, or **Failure** tab to filter the list of backups to show only those tasks with a status of In Progress, Success, or Failure.

During the backup process, Catalyst Center Global Manager creates the backup database and files. The backup files are saved to the specified location. You are not limited to a single set of backup files, but can create multiple backup files that are identified with their unique names. The status of the backup job changes from **In Progress** to **Success** when the process is finished.

**Note**
If the backup process fails, there is no impact on the Catalyst Center Global Manager operation or its database. The most common reason for a failed backup is insufficient disk space. If your backup process fails, make sure that there is sufficient disk space on the remote server and attempt another backup.

## Restore data from backups

Use this procedure to restore backup data from your Catalyst Center Global Manager.



**Caution** The Catalyst Center Global Manager restore process restores only the database and files. The restore process does not reflect any changes made since the last backup. This mean that any changes made after the last backup, including adding or deleting controllers, may be lost.

### Before you begin

Make sure that these requirements are met:

- Only a user with SUPER-ADMIN-ROLE permissions can perform this procedure.
- You have backups from which to restore data.

When you restore data, Catalyst Center Global Manager enters maintenance mode and is unavailable until the restore process completes. Make sure that you restore data at a time when Catalyst Center Global Manager can be unavailable.

### Procedure

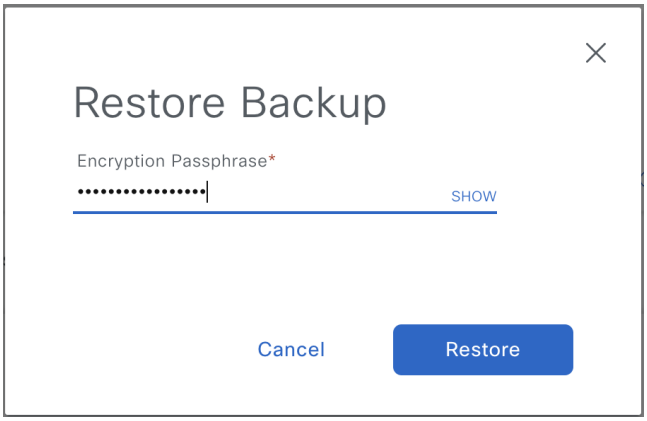
**Step 1** From the main menu, choose **System** > **Backup & Restore**.

If you have created a backup, it appears in the **Backup & Restore** window.

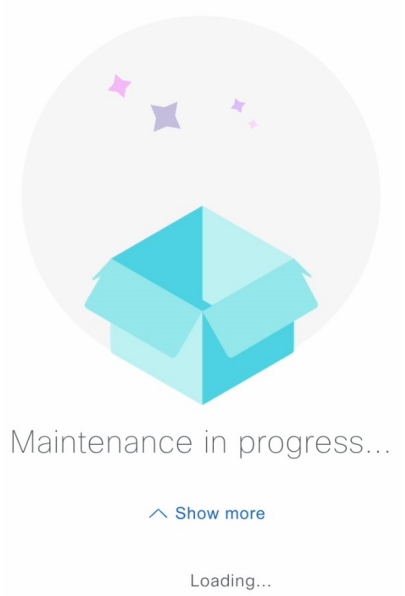
**Step 2** In the **Backup Name** column, locate the backup that you want to restore.

**Step 3** In the **Actions** column, click the ellipsis and choose **Restore**.

**Step 4** In the **Restore Backup** dialog box, enter the **Encryption Passphrase** that you used while configuring the backup location and click **Restore**.




The appliance goes into maintenance mode and starts the restore process.




When the restore operation is complete, its status in the **Backup & Restore** window table changes to `Success`.

**Step 5** After the restore operation completes, click **Log In** to log back in to Catalyst Center Global Manager.

**Step 6** Enter the admin user's username and password, then click **Login**.

# System settings

To start using Catalyst Center Global Manager, you must first configure the system settings. This allows the server to communicate outside the network, ensures secure communications, authenticates users, and supports other key tasks. Use the procedures in this chapter to configure the system settings.

**Note** Any changes that you make to the Catalyst Center Global Manager configuration—including changes to the proxy server settings—must be done from the Catalyst Center Global Manager GUI.

The Catalyst Center Global Manager **Settings** page provides you with these details:

- **Certificates**
  - **System Certificates**: Helps you to view information about the server's currently active SSL certificate or information about how to replace it.

    For more information on security best practices and managing certificates in Catalyst Center Global Manager, see Cisco Catalyst Center Security Best Practices Guide.

- **External Services**
  - **Destinations**: allows you to configure these types of destinations to deliver event notifications from Catalyst Center Global Manager: webhook, email, syslog, and SNMP.

    To configure REST Endpoint, email settings, syslog server, or SNMP trap server, go to the main menu, choose **System** > **Settings** > **External Services** > **Destinations**.
  - **Cisco Catalyst Cloud**: allows you to register Catalyst Center Global Manager with **Cisco Catalyst Cloud** to access and download Catalyst Center Global Manager configurations.

**Note** The settings page will show the Catalyst Center Global Manager configuration claimed through **First Time Setup** workflow.

De-registering will unclaim the Catalyst Center Global Manager profile and unenroll all controllers registered on the server. After this, the Catalyst Center Global Manager will display the menus for controllers that are absent.

- **System Configuration**
  - **System Health**: allows you to update Catalyst Center Global Manager with most recent validation catalog. The validation catalog serves as a repository of validation sets, which define the specific checks or tests to be performed.

    The purpose of updating the **Validation Catalog** in Catalyst Center Global Manager is to keep the set of validation checks or tests current, accurate, and relevant. This update refreshes the repository of validation criteria that the validation tool uses to perform system checks and enabling the detection of new issues.
  - **Proxy**: allows you to configure the system proxy to access the internet.
  - **Debugging Logs**: use this form to configure the logging of internal processes and errors.
  - **Backup Configurations**: allows you to configure backup mount path, encryption passphrase and data retention.
  - **Authentication API Encryption**: allows you to configure AES Encryption settings.
  - **Integration Settings**: allows you to configure the Host Name or IP Address that will be used in the Integration Callback URLs.

- **Login Message**: shows a message for users when they log in.

- **Terms and Conditions**
  - **Product Offer**: provides the general terms and conditions for Catalyst Center Global Manager. Catalyst Center Global Manager is governed solely by the Cisco General Terms (formerly "End User License Agreement").

- **Trust and Privacy**
  - **Account Lockout**: manages user login attempts, account lockout period, and login retries.
  - **Password Expiry**: sets the user password expiry check.
  - **IP Access Control**: configures IP addresses list for access restriction.
  - **Product Telemetry**: provides product telemetry terms for Catalyst Center Global Manager. Catalyst Center controller collects Systems Information (formerly "Product Usage Telemetry") to improve your product experience. Catalyst Center Global Manager does not collect or process Systems Information.

# Users and roles

The Catalyst Center Global Manager uses both users and roles to manage access. Each user is assigned roles to access controller functionality.

- **User Management**: The Catalyst Center Global Manager uses users, roles and access groups to manage access. A user is mapped to an access group to determine the scope and permission(s).
- **Role Based Access Control**: Role-Based Access Control (RBAC) in Catalyst Center Global Manager currently supports only the default roles: super-admin-role, observer-role, and network-admin-role. Custom role creation is not supported. Additionally, the user experience in Catalyst Center Global Manager may be impacted if there is a mismatch in permissions for the same user between Catalyst Center Global Manager and Catalyst Center. For example, if a user in Catalyst Center Global Manager does not have identical privileges in Catalyst Center due to site-based restrictions or custom roles, the Catalyst Center Global Manager may display limited data based on the user's access privileges.

  Also, accessing Catalyst Center Global Manager with a custom role or a site-based user from Catalyst Center is currently not supported, which may result in a suboptimal user experience.

  - The **SUPER-ADMIN-ROLE** has full control over the Catalyst Center Global Manager deployment, with all access permissions enabled.
  - The **OBSERVER-ROLE** has read-only access and cannot view certain sensitive data within the system settings.
  - The **NETWORK-ADMIN-ROLE** is a general-purpose role that does not have the capability to alter system configurations.

  On installation of Catalyst Center Global Manager, a user with super-admin privilege is created. The user in super-admin role will have the ability to create local users on Catalyst Center Global Manager.
- **External Authentication**: Catalyst Center Global Manager supports external Authentication, Authorization and Accounting (AAA) servers for access control. If you are using an external server for authentication

and authorization of external users, you should enable external authentication in Catalyst Center Global Manager. The default AAA attribute setting matches the default user profile attribute.

Catalyst Center Global Manager enables external authentication with either AAA–RADIUS/TACACS or Cisco ISE server type. The external authentication process disables local user authentication.

**Note** If external authentication is enabled on a specific Catalyst Center and it is integrated with Catalyst Center Global Manager, data specific to this controller is not fetched if the user has not logged in at least once using their external authentication credentials. Consequently, any cross-launch to that Catalyst Center fails. Users must log in to Catalyst Center at least once before they can view any controller-specific data in Catalyst Center Global Manager or perform a cross-launch to that Catalyst Center.