Basics of Cisco Defense Orchestrator

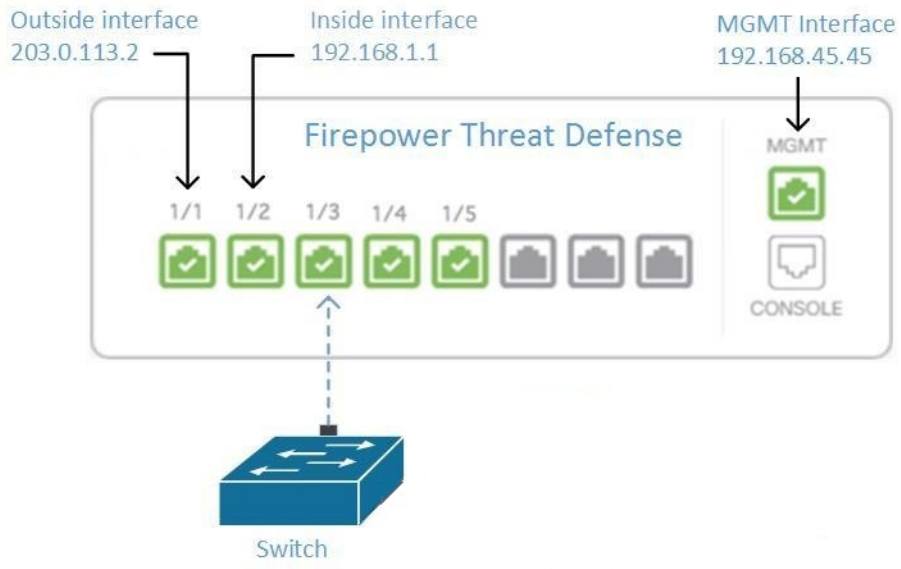
Cisco Defense Orchestrator (CDO) provides a unique view of policy management through a clear and concise interface. Below are topics that cover the basics of using CDO for the first time.

Networking Requirements

Managing an FDM-Managed Device from the Inside Interface

Managing an FDM-managed device using the inside interface may be desirable if the dedicated MGMT interface is assigned an address that is not routable within your organization; for example, it might only be reachable from within your data center or lab.

Figure 1: Interface Addresses



Remote Access VPN Requirement

If the FDM-managed device you manage with CDO will be managing Remote Access VPN (RA VPN) connections, CDO must manage the device using the inside interface.

What to do next:

Continue to Manage an FDM-Managed Device from the Inside Interface, on page 2 for the procedure for configuring the FDM-managed device.

Manage an FDM-Managed Device from the Inside Interface

This configuration method:

- Assumes that the FDM-managed device has not been on-boarded to CDO.
- Configures a data interface as the inside interface.
- Configures the inside interface to receive MGMT traffic (HTTPS).
- Allows the address of the cloud connector to reach the inside interface of the device.

Before you begin

Review the prerequisites for this configuration in these topics:

- Managing an FDM-Managed Device from the Inside Interface, on page 2
- Connect Cisco Defense Orchestrator to your Managed Devices, on page 14

Procedure

Step 1 Log in to the Secure Firewall device manager.

Step 2 In the **System Settings** menu, click **Management Access**.

Step 3 Click the **Data Interfaces** tab and click **Create Data Interface**.

a. In the **Interface** field, select the pre-named "**inside**" interface from the list of interfaces.

b. In the **Protocols** field, select **HTTPS** if it is not already.

c. In the **Allowed Networks** field, select the network objects that represent the networks inside your organization that will be allowed to access the inside address of the FDM-managed device. The IP address of the SDC or cloud connector should be among the addresses allowed to access the inside address of the device.

In the Interface Addresses diagram, the SDC's IP address, 192.168.1.10 should be able to reach 192.168.1.1.

Step 4 **Deploy the change**. You can now manage the device using the inside interface.

What to do next

What if you are using a Cloud Connector?

Use the procedure above and add these steps:

- Add a step to "NAT" the outside interface to (203.0.113.2) to the inside interface (192.168.1.1).
- In step 3c of the procedure above, your "Allowed Network" is a network group object containing the the public IP addresses of the cloud connector.
- Add a step that creates an Access Control rule allowing access to the outside interface (203.0.113.2) from the public IP addresses of the cloud connector.

If you are a customer in **Europe, the Middle East, or Africa (EMEA)**, and you connect to CDO at https://defenseorchestrator.eu/, these are the public IP addresses of the cloud connector:

- 35.157.12.126
- 35.157.12.15

If you are a customer in the **United States**, and you connect to CDO at https://defenseorchestrator.com/, these public IP addresses of the cloud connector:

- 52.34.234.2
- 52.36.70.147

If you are a customer in the **Asia-Pacific-Japan-China (AJPC)** region, and you connect to CDO at https://www.apj.cdo.cisco.com/, allow inbound access from the following IP addresses:

- 54.199.195.111
- 52.199.243.0

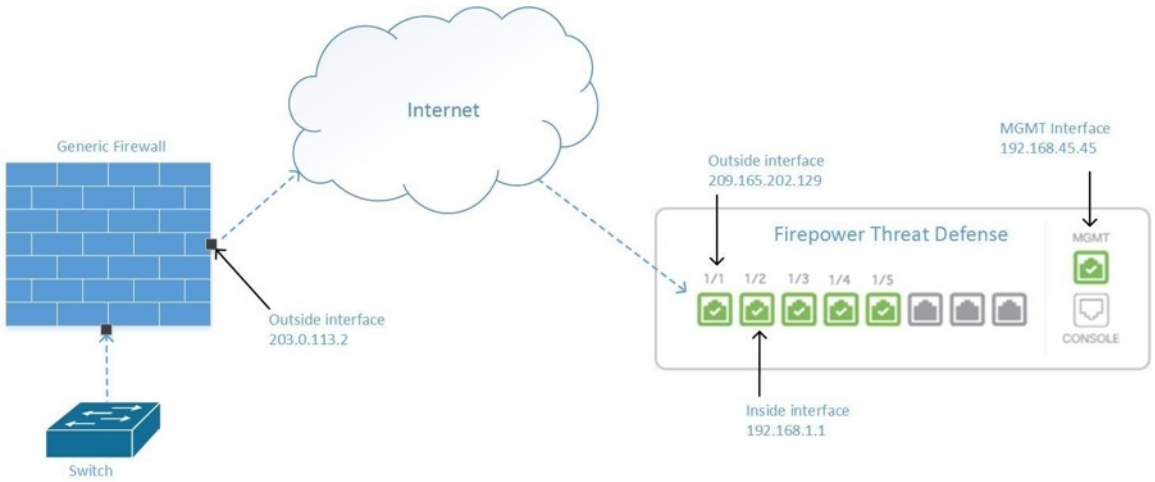
Onboard the FDM-Managed Device

The recommended way of onboarding the FDM-managed device to CDO is to use the registration token onboarding approach. After you configure the inside interface to allow management access from the Cloud Connector to the FDM-managed device, onboard the FDM-managed device with the user name and password.

Managing an FDM-Managed Device from the Outside Interface

Managing an cloud-delivered Firewall Management Center device from the outside interface may be desirable if you have one public IP address assigned to a branch office and Cisco Defense Orchestrator is managed using a Cloud Connector at another location.

Figure 2: Device Management on Outside Interface



This configuration doesn't mean that the physical MGMT interface is no longer the device's management interface. If you were in the office where the cloud-delivered Firewall Management Center device was located, you would be able to connect to the address of the MGMT interface and manage the device directly.

Remote Access VPN Requirement

If the device you manage with cloud-delivered Firewall Management Center will be managing Remote Access VPN (RA VPN) connections, cloud-delivered Firewall Management Center will not be able to manage the cloud-delivered Firewall Management Center device using the outside interface. See Managing an FDM-Managed Device from the Inside Interface instead.

What to do next:

Continue to Manage the FDM-Managed Device's Outside Interface, on page 5 for the procedure for configuring the cloud-delivered Firewall Management Center device.

Manage the FDM-Managed Device's Outside Interface

This configuration method:

1. Assumes that the FDM-managed device has not been on-boarded to CDO.
2. Configures a data interface as the outside interface.
3. Configures management access on the outside interface.
4. Allows the public IP address of the cloud connector (after it has been NAT'd through the firewall) to reach the outside interface.

Before you begin

Review the prerequisites for this configuration in these topics:

- Manage the FDM-Managed Device's Outside Interface, on page 5
- Connect Cisco Defense Orchestrator to your Managed Devices, on page 14

Procedure

Step 1 Log in to the Secure Firewall device manager.

Step 2 In the **System Settings** menu, click **Management Access**.

Step 3 Click the **Data Interfaces** tab and click **Create Data Interface**.

a. In the **Interface** field, select the pre-named "**outside**" interface from the list of interfaces.

b. In the **Protocols** field, select **HTTPS** if it is not already. CDO only needs HTTPS access.

c. In the **Allowed Networks** field, create a host network object containing the public-facing IP address of the cloud connector after it gets NAT'd through the firewall.

   In the Device Management from Outside Interface network diagram, the cloud connector's IP address, 10.10.10.55, would be NAT'd to 203.0.113.2. For the Allowed Network, you would create a host network object with the value 203.0.113.2.

Step 4 Create an Access Control policy in Secure Firewall device manager that allows management traffic (HTTPS) from the public IP address of the SDC or cloud connector, to the outside interface of your FDM-managed device. In this scenario, the source address would be 203.0.113.2 and the source protocol would be HTTPS; the destination address would be 209.165.202.129 and the protocol would be HTTPS.

Step 5 **Deploy the change**. You can now manage the device using the outside interface.

What to do next

What if you are using a cloud connector?

The process is very similar, except for two things:

- In step 3c of the procedure above, your "Allowed Network" is a network group object containing the the public IP addresses of the cloud connector.

- If you are a customer in **Europe, the Middle East, or Africa (EMEA)**, and you connect to CDO at https://defenseorchestrator.eu/, these are the public IP addresses of the cloud connector:
  - 35.157.12.126
  - 35.157.12.15
- If you are a customer in the **United States**, and you connect to CDO at https://defenseorchestrator.com/, these are the public IP addresses of the cloud connector:
  - 52.34.234.2
  - 52.36.70.147
- If you are a customer in the **Asia-Pacific-Japan-China (AJPC)** region, and you connect to CDO at https://www.apj.cdo.cisco.com/, allow inbound access from the following IP addresses:
  - 54.199.195.111
  - 52.199.243.0

- In step 4 of the procedure above, you create an Access Control rule that allows access to the outside interface from the public IP addresses of the cloud connector.

The registration token onboarding approach is the recommended way of onboarding the FDM-managed device to CDO. After you configure the outside interface to allow management access from the cloud connector, onboard the FDM-managed device. You will connect using the IP address of the outside interface. In our scenario, that address is 209.165.202.129.

Create a CDO Tenant

You can provision a new CDO tenant to onboard and manage your devices. If you use an On-Prem Firewall Management Center Version 7.2 and later, and want to integrate it with the Cisco Security Cloud, you can also create a CDO tenant as part of the integration workflow.

Procedure

1. Go to https://www.defenseorchestrator.com/provision.
2. Select the region where you want to provision your CDO tenant and click **Sign Up**.
3. On the **Security Cloud Sign On** page, provide your credentials.
4. If you do not have a Security Cloud Sign On account and want to create one, click **Sign up now**.
   a. Provide the information you are prompted for, and click **Sign up**.

      Clicking on **Sign up** triggers a mail to the e-mail ID you just provided, with a link to activate your account.

   b. Click **Activate account** both on the mail and the **Security Cloud Sign On** page.

   c. Configure multifactor authentication using Duo on a device of your choice and click **Log in with Duo** and **Finish**.

Note We recommend installing the Duo Security app on a mobile phone. Review Duo Guide to Two Factor Authentication: Enrollment Guide if you have questions about installing Duo.

5. Provide a name for your tenant and click **Create new account**.
6. A new CDO tenant is created in the region you have chosen; you will also receive an e-mail about your CDO tenant being created, with the details. If you are associated with multiple CDO tenants already, on the **Choose a tenant** page, select the tenant you just created to log in to it. If you have created a new CDO tenant for the first time, you get logged into your tenant directly.

   For information about logging on to your CDO tenant for the first time, see Initial Login to Your New CDO Tenant.

   For information about managing a CDO tenant and various tenant settings, see Tenant Management.

Upgrade your CDO tenant to full version

If you are using a free trial version of CDO, you will keep seeing the **You are in a free trial of CDO** banner, with the number of days left in the trial period. You can choose to upgrade your CDO tenant to full version any time during the trial period. Contact your Cisco sales representative or contact Cisco Sales, and they can place an order on your behalf and get you the sales order number.

Once you obtain the sales order number, click **Upgrade to full version** on the banner and enter the order number to begin using the full version of CDO.

Request CDO trial period extension

If you want to continue using the trial version for 30 days, click **Request for an extension**.

Sign in to CDO

To log in to Cisco Defense Orchestrator (CDO), a customer needs an account with a SAML 2.0-compliant identity provider (IdP), a multi-factor authentication provider, and Manage Users in CDO.

The IdP account contains the user's credentials and the IdP authenticates the user based on those credentials. Mutli-factor authentication provides an added layer of identity security. The CDO user record primarily contains the username, the CDO tenant with which they are associated, and the user's role. When a user logs in, CDO tries to map the IdP's user ID to an existing user record on a tenant in CDO. The user is logged in to that tenant when CDO finds a match.

Unless your enterprise has its own single sign-on identity provider, your identity provider is Cisco Security Cloud Sign On. Cisco Security Cloud Sign On uses Duo for multi-factor authentication. Customers can Integrate Your SAML Single Sign-On with Cisco Defense Orchestrator if they choose.

To log into CDO, you must first create an account in Cisco Security Cloud Sign On, configure multi-factor authentication (MFA) using Duo Security and have your tenant Super Admin create a CDO record.

On October 14, 2019, CDO converted all previously-existing tenants to use Cisco Security Cloud Sign On as their identity provider and Duo for MFA.

Note

- If you sign in to CDO using your own single sign-on identity provider, the transition to Cisco Security Cloud Sign On did not affect you. You continue to use your own sign-on solution.
- If you are in the middle of a free trial of CDO, this transition did affect you.

If your CDO tenant was created on or after October 14, 2019, see Initial Login to Your New CDO Tenant, on page 8.

If your CDO tenant existed before October 14, 2019, see Migrate to Cisco Security Cloud Sign On Identity Provider, on page 9.

Initial Login to Your New CDO Tenant

Before You Begin

Install DUO Security. We recommend installing the Duo Security app on a mobile phone. Review Duo Guide to Two Factor Authentication: Enrollment Guide if you have questions about installing Duo.

Time Synchronization. You are going to use your mobile device to generate a one-time password. It is important that your device clock is synchronized with real time as the OTP is time-based. Make sure your device clock set automatically or manually set it to the correct time.

Cisco Defense Orchestrator (CDO) uses Cisco Security Cloud Sign On as its identity provider and Duo for multi-factor authentication (MFA). . If you do not have a Cisco Security Cloud Sign On account, when you create a new CDO tenant using https://www.defenseorchestrator.com/provision, the provisioning flow involves various steps, including creating a Security Cloud Sign On account and configuring MFA using Duo.

MFA provides an added layer of security in protecting your user identity. Two-factor authentication, a type of MFA, requires two components, or factors, to ensure the identity of the user logging into CDO. The first factor is a username and password, and the second is a one-time password (OTP), which is generated on demand.

Important **If your CDO tenant existed before October 14, 2019**, use Migrate to Cisco Security Cloud Sign On Identity Provider, on page 9 for log in instructions instead of this article.

What to do next?

Continue to, Create a New Cisco Security Cloud Sign On Account and Configure Duo Multi-factor Authentication, on page 68. It is a four-step process. You need to complete all four steps.

Troubleshooting Login Failures

Login Fails Because You are Inadvertently Logging in to the Wrong CDO Region

Make sure you are logging into the appropriate CDO region. After you log into https://sign-on.security.cisco.com, you will be given a choice of what region to access. Click the **CDO** tile to access defenseorchestrator.com or **CDO (EU)** to access defenseorchestrator.eu.

Migrate to Cisco Security Cloud Sign On Identity Provider

On October 14, 2019, Cisco Defense Orchestrator(CDO) converted all tenants to Cisco Security Cloud Sign On as their identity provider and Duo for multi-factor authentication (MFA). **To log into CDO, you must first activate your account in Cisco Secure Sign-On and configure MFA using Duo**.

CDO requires MFA which provides an added layer of security in protecting your user identity. Two-factor authentication, a type of MFA, requires two components, or factors, to ensure the identity of the user logging into CDO. The first factor is a username and password, and the second is a one-time password (OTP), which is generated on demand.

Note

- If you sign in to CDO using your own single sign-on identity provider, this transition to Cisco Security Cloud Sign On and Duo does not affect you. You continue to use your own sign-on solution.
- If you are in the middle of a free trial of CDO, this transition does apply to you.
- **If your CDO tenant was created on or after October 14, 2019**, see Initial Login to Your New CDO Tenant, on page 8 for log in instructions instead of this article.

Before You Begin

We strongly recommend the following steps prior to migrating:

- **Install DUO Security.** We recommend installing the Duo Security app on a mobile phone. Review Duo Guide to Two Factor Authentication: Enrollment Guide if you have questions about installing Duo.
- **Time Synchronization**. You are going to use your mobile device to generate a one-time password. It is important that your device clock is synchronized with real time as the OTP is time-based. Make sure your device clock set automatically or manually set it to the correct time.
- Create a New Cisco Secure Sign-On Account and Configure Duo Multi-factor Authentication. It is a four-step process. You need to complete all four steps.

Troubleshooting Login Failures after Migration

Login to CDO Fails Because of Incorrect Username or Password

Solution If you try to log in to CDO and you *know* you are using the correct username and password and your login is failing, or you try "forgot password" cannot recover a viable password, you may have tried to login without creating a new Cisco Security Cloud Sign On account, you need to sign up for a new Cisco Security Cloud Sign On Account by following the instructions in Create a New Cisco Security Cloud Sign On Account and Configure Duo Multi-factor Authentication, on page 68.

Login to the Cisco Security Cloud Sign On Dashboard Succeeds but You Can't Launch CDO

Solution You may have created a Cisco Security Cloud Sign On account with a different username than your CDO tenant. Contact the Cisco Technical Assistance Center (TAC) to standardize your user information between CDO and Cisco Secure Sign-On.

Login Fails Using a Saved Bookmark

Solution You may be attempting to log in using an old bookmark you saved in your browser. The bookmark could be pointing to https://cdo.onelogin.com.

Solution Log in to https://sign-on.security.cisco.com.

- **Solution** If you have not yet created a a Cisco Secure Sign-On account, Create a New Cisco Security Cloud Sign On Account and Configure Duo Multi-factor Authentication.
- **Solution** If you have created your new account, click the CDO tile on the dashboard that corresponds to Cisco Defense Orchestrator(US), Cisco Defense Orchestrator (EU), or Cisco Defense Orchestrator (APJC)
- **Solution** Update your bookmark to point to https://sign-on.security.cisco.com.

Launch a CDO Tenant

Procedure

Step 1 Click the appropriate CDO button on the Cisco Security Cloud Sign On dashboard. The CDO tile directs you to https://defenseorchestrator.com, the CDO (EU) tile directs you to https://defenseorchestrator.eu

Step 2 Click the authenticator logo to choose Duo Security or Google Authenticator if you have set up both authenticators.

- If you already have a user record on an existing tenant, you are logged into that tenant.
- If you already have a user record on several portals, you will be able to choose which portal to connect to.
- If you already have a user record on several tenants, you will be able to choose which CDO tenant to connect to.
- If you do not already have a user record on an existing tenant, you will be able to learn more about CDO or request a trial tenant.

The **Portals** view retrieves and displays consolidated information from multiple tenants. See Manage Multi-Tenant Portal, on page 58 for more information.

The **Tenant** view shows several tenants on which you have a user record.

Manage Super Admins on Your Tenant

It is a best practice to limit the number of Super Admins on your tenant. Determine which users should have Super Admin privileges, review Manage Users in CDO, and change the roles of other users to "Admin."

About CDO Licenses

CDO requires a base subscription for tenant entitlement and device licenses for managing devices. You can buy one or more CDO base subscriptions based on the number of tenants you require and device licenses based on the device model number and the quantity. In other words, purchasing the base subscription gives you a CDO tenant, and for every device you choose to manage using CDO, you need separate device licenses. For the purposes of planning your deployment, note that each CDO tenant can manage approximately 500 devices through the Secure Device Connector (SDC) and any number of devices using the cloud connector. See Secure Device Connector (SDC) for more information.

To onboard and manage devices from Cisco Defense Orchestrator, you need to purchase a base subscription and device-specific, term-based subscriptions based on the devices you want to manage.

Subscriptions

Cisco Defense Orchestrator subscriptions are term-based:

- **Base** - Offers subscriptions for one, three, and five years, and provides entitlement to access the CDO tenant and onboard adequately licensed devices.
- **Device License** - Offers subscriptions for one, three, and five years for any supported device you choose to manage. For example, you can choose to manage a Cisco Firepower 1010 device using CDO for three years, if you purchase a three-year software subscription to the Cisco Firepower 1010 device.

See Software and Hardware Supported by CDO for more information on Cisco security devices that CDO supports.

Important You do not require two separate device licenses to manage a high availabilty device pair in CDO. If you have a Secure Firewall Threat Defense (FTD) high availability pair, purchasing one FTD device license is sufficient, as CDO considers the pair of high availability devices as one single device.

Note You cannot manage CDO licensing through the Cisco smart licensing portal.

Software Subscription Support

The CDO base subscription includes software subcription support that is valid for the term of the subscription and provides access to software updates, major upgrades, and Cisco Technical Assistance Center (TAC), at no extra cost. While the software support is selected by default, you can also leverage the CDO solution support based on your requirement.

Cisco Defense Orchestrator Evaluation License

You can request for a 30-day Cisco Defense Orchestrator trial from your SecureX account. See Request a CDO Tenant for more information.

Cloud-Delivered Firewall Management Center and Threat Defense Licenses

You do not have to purchase a separate license to use the cloud-delivered Firewall Management Center in CDO; the base subscription for a CDO tenant includes the cost for the cloud-delivered Firewall Management Center.

Cloud-delivered Firewall Management Center Evaluation License

The cloud-delivered Firewall Management Center comes provisioned with a 90-day evaluation license, after which the threat defense services are blocked.

To learn how to get a cloud-delivered Firewall Management Center provisioned on your CDO tenant, see Request a Cloud-delivered Firewall Management Center for your CDO Tenant.

Note The cloud-delivered Firewall Management Center does not support specific license reservation (SLR) for devices in air-gapped networks.

Threat Defense Licenses for Cloud-Delivered Firewall Management Center

You need individual licenses for each Secure Firewall Threat Defense device managed by the cloud-delivered Firewall Management Center. See Licensing in *Managing Firewall Threat Defense with Cloud-Delivered Firewall Management Center in Cisco Defense Orchestrator* for information.

To know how CDO handles licensing for the devices migrated to the cloud-delivered Firewall Management Center, see Migrate Threat Defense from Management Center to Cloud.

Secure Device Connector

The Secure Device Connector (SDC) is an intelligent proxy that allows your Cisco devices to communicate with CDO. When onboarding a device that is not directly reachable over the internet to CDO using device credentials, you can deploy an SDC in your network to proxy communications between the devices and CDO. Alternatively, if you prefer, you can enable a device to receive direct communications through its outside interface from CDO. Adaptive Security Appliances (ASA), Meraki MXs, Secure Firewall Threat Defense devices, and Secure Firewall Management Center devices, generic SSH and IOS devices, can all be onboarded to CDO using an SDC.

The SDCmonitors CDO for commands that need to be executed on your managed devices, and messages that need to be sent to your managed devices. The SDC executes the commands on behalf of CDO, sends messages to CDO on behalf of the managed devices, and returns replies from the managed devices to CDO.

The SDC uses secure communication messages signed and encrypted using AES-128-GCM over HTTPS (TLS 1.2) to communicate with CDO. All credentials for onboarded devices and services are encrypted directly from the browser to the SDC as well as encrypted at rest using AES-128-GCM. Only the SDC has access to the device credentials. No other CDO service has access to the credentials. See Connect Cisco Defense Orchestrator to your Managed Devices, on page 14 for information explaining how to allow communication between between an SDC and CDO.

The SDC may be installed on an appliance, as a virtual machine on a hypervisor, or in a cloud environment like AWS or Azure. You can install an SDC by using a combined virtual machine and SDC image provided by CDO, or you can create your own virtual machine and install the SDC on it. The SDC virtual appliance includes a CentOS or Ubuntu operating system and runs within a Docker container.

Each CDO tenant can have an unlimited number of SDCs. These SDCs are not shared between tenants, they are dedicated to a single tenant. The number of devices a single SDC can manage depends on the features implemented on those devices and the size of their configuration files. For the purposes of planning your deployment, however, expect one SDC to support approximately 500 devices.

Deploying more than one SDC for your tenant also provides these benefits:

- You can manage more devices with your CDO tenant without experiencing performance degradation.
- You can deploy an SDC to an isolated network segment within your network and still manage the devices in that segment with the same CDO tenant. Without multiple SDCs, you would need to manage the devices in those isolated network segments with different CDO tenants.

The procedure for deploying a second or subsequent SDC is the same for deploying your first SDC. The initial SDC on your tenant incorporates the name of your tenant and the number 1 and is displayed on the **Secure Connectors** tab in the **Services** page of CDO. Each additional SDC is numbered in order. See Deploy a Secure Device Connector Using CDO's VM Image, on page 15 and Deploy a Secure Device Connector on your own VM, on page 19

Related Information:

- Connect Cisco Defense Orchestrator to your Managed Devices
- Update your Secure Device Connector, on page 32
- Remove a Secure Device Connector, on page 30

Connect Cisco Defense Orchestrator to your Managed Devices

CDO connects to the devices it manages through the cloud connector or through a Secure Device Connector (SDC).

If your device can be accessed directly from the internet you should be using the cloud connector to connect to your device. If you can, configure the device to allow inbound access on port 443 from the CDO IP addresses in your cloud region.

If your device is not accessible from the internet you can deploy an on-premises SDC in your network to allow CDO to communicate with your devices.

Configure the device to, allow full inbound access on port 443 (or whichever port you have configured for your device management).

An FDM-managed device can be onboarded to CDO using its device credentials, a registration key, or it's serial number whether or not it is directly accessible from the internet. If the FDM-managed device does not have direct access to the internet, but it resides on a network that does, the Security Services Exchange connector delivered as part of the device, can reach the Security Services Exchange cloud, allowing the FDM-managed device to be onboarded.

You need an on-premises SDC in your network to onboard:

- An FDM-managed device that is not accessible from the cloud and the “credentials onboarding” method is used.

All other devices and services do not require an on-premise SDC. CDO will connect using its “cloud connector”. See the next section to know the IP addresses that must be allowed for inbound access.

Connecting Devices to CDO Through the Cloud Connector

When connecting CDO directly to your device through the cloud connector, you should allow inbound access on port 443 (or whichever port you have configured for your device management) for the various IP addresses in the EMEA, United States, or APJC region.

If you are a customer in **Europe, the Middle East, or Africa (EMEA)** region, and you connect to CDO at https://defenseorchestrator.eu/, allow inbound access from the following IP addresses:

- 35.157.12.126
- 35.157.12.15

If you are a customer in the **United States** region, and you connect to CDO at https://defenseorchestrator.com, allow inbound access from the following IP addresses:

- 52.34.234.2
- 52.36.70.147

If you are a customer in the **Asia-Pacific-Japan-China (APJC)** region, and you connect to CDO at https://www.apj.cdo.cisco.com/, allow inbound access from the following IP addresses:

- 54.199.195.111
- 52.199.243.0

Connecting CDO to SDC

When connecting CDO to your device through an SDC, the devices you want CDO to manage must allow full inbound access on port 443 (or whichever port you have configured for your device management). This is configured using a management access control rule.

You must also ensure that the virtual machine on which the SDC is deployed has network connectivity to the management interface of the managed device.

Deploy a Secure Device Connector Using CDO's VM Image

When using device credentials to connect CDO to a device, it is a best practice to download and deploy an SDC in your network to manage the communication between CDO and the device. Typically, these devices are non-perimeter based, do not have a public IP address, or have an open port to the outside interface. Adaptive Security Appliances (ASAs), FDM-managed devices, Firepower Management Centers (FMCs), and SSH and IOS devices, can all be onboarded to CDO using an SDC.

The SDC monitors CDO for commands that need to be executed on your managed devices, and messages that need to be sent to your managed devices. The SDC executes the commands on behalf of CDO, sends messages to CDO on behalf of the managed devices, and returns replies from the managed devices to CDO.

The number of devices a single SDC can manage depends on the features implemented on those devices and the size of their configuration files. For the purposes of planning your deployment, however, we expect one SDC to support approximately 500 devices. See Using Multiple SDCs on a Single CDO Tenant, on page 33 for more information.

This procedure describes how to install an SDC in your network, using CDO's VM image. This is the preferred, easiest, and most reliable way to create an SDC. If you need to create the SDC using a VM that you create, follow Deploy a Secure Device Connector on your own VM, on page 19.

Before you begin

Review these prerequisites before you deploy the SDC:

- CDO requires strict certificate checking and does not support Web/Content Proxy inspection between the Secure Device Connector (SDC) and the Internet. If using a proxy server, disable inspection for traffic between the SDC and CDO.
- The SDC must have full outbound access to the internet on TCP port 443, or the port you have configured for device management. The devices managed by CDO must also allow inbound traffic from this port.
- Review Connect Cisco Defense Orchestrator to your Managed Devices to ensure proper network access.
- CDO supports installing its SDC VM OVF image using the vSphere web client or the ESXi web client.
- CDO does not support installing the SDC VM OVF image using the vSphere desktop client.
- ESXi 5.1 hypervisor.
- Cent OS 7 guest operating system.
- System requirements for a VMware ESXi host with only one SDC:
  - VMware ESXi host needs 2 CPU.
  - VMware ESXi host needs a minimum of 2 GB of memory.

- VMware ESXi requires 64 GB disk space to support the virtual machine depending on your provisioning choice.

- System requirements for a VM with an SDC and **a single** Secure Event Connector (SEC) for your tenant. (The SEC is a component used in Cisco Security Analytics and Logging).

  Each SEC that you add to the VMware ESXi host requires an additional 4 CPUs and an additional 8 GB of memory.

  Therefore, these are the requirements for a VMware ESXi host with one SDC and one SEC:

  - VMware ESXi host needs 6 CPU.
  - VMware ESXi host needs a minimum of 10 GB of memory.
  - VMware ESXi requires 64 GB disk space to support the virtual machine depending on your provisioning choice.

- The dockers IP must be in a different subnet than the SDC's IP range **and** the device IP range.
- Gather this information before you begin the installation:
  - Static IP address you want to use for your SDC.
  - Passwords for the `root` and `cdo` users that you create during the installation process.
  - The IP address of the DNS server your organization uses.
  - The gateway IP address of the network the SDC address is on.
  - The FQDN or IP address of your time server.
- The SDC virtual machine is configured to install security patches on a regular basis and in order to do this, opening port 80 outbound is required.

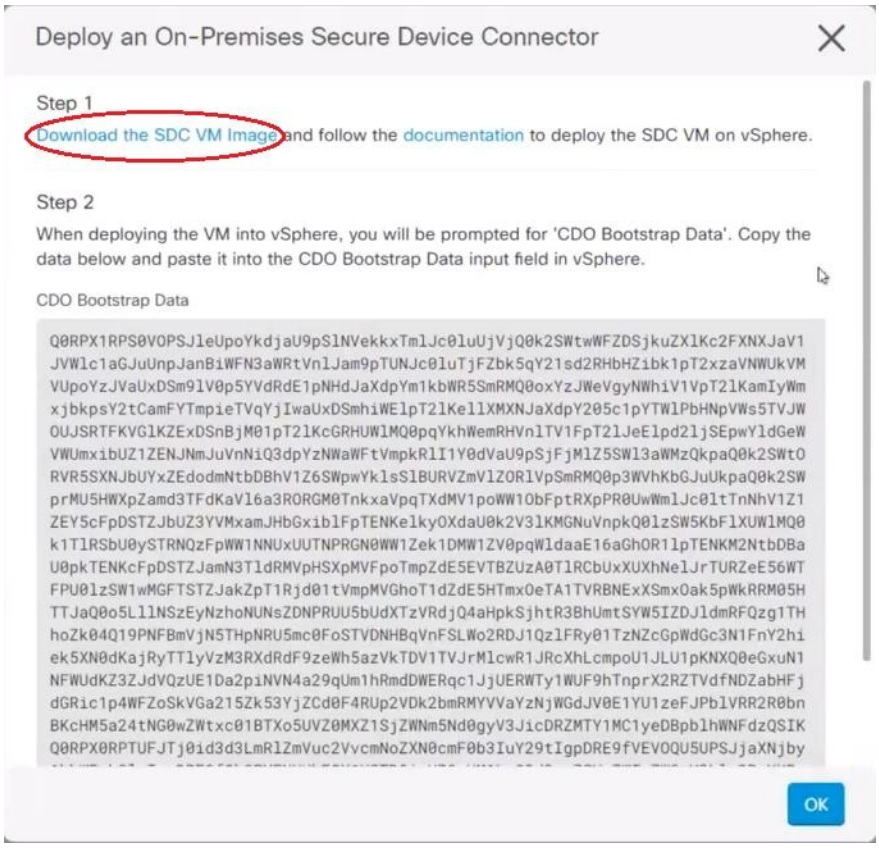
Procedure

Step 1 Log on to the CDO Tenant you are creating the SDC for.

Step 2 From the CDO menu, choose **Tools & Services** > **Secure Connectors**.

Step 3 On the **Services** page, select the **Secure Connectors** tab, click the blue plus button, and select **Secure Device Connector**.

Step 4 In Step 1, click **Download the SDC VM image**. This opens in a separate tab.



Step 5 Extract all the files from the .zip file. They will look similar to these:

- CDO-SDC-VM-ddd50fa.ovf
- CDO-SDC-VM-ddd50fa.mf
- CDO-SDC-VM-ddd50fa-disk1.vmdk

Step 6 Log on to your VMware server as an administrator using the vSphere Web Client.

Note Do not use the ESXi Web Client.

Step 7 Deploy the Secure Device Connector virtual machine from the OVF template by following the prompts.

Step 8 When the setup is complete, power on the SDC VM.

Step 9 Open the console for your new SDC VM.

Step 10 Login with the username **cdo**. The default password is **adm123**.

Step 11 At the prompt, type `sudo sdc-onboard setup`.

```
[cdo@localhost ~]$ sudo sdc-onboard setup
```

Step 12 When prompted for the password, enter `adm123`.

Step 13 Follow the prompts to create a new password for user `root`. Enter your password for the root user.

Step 14 Follow the prompts to create a new password for the **cdo** user. Enter your password for the cdo user

Step 15 When prompted with **Please choose the CDO domain you connect to**, enter your Cisco Defense Orchestrator domain information.

Step 16 Enter the following domain information of the SDC VM when prompted:

a) IP Address/CIDR
b) Gateway
c) DNS Server
d) NTP Server or FQDN
e) Docker Bridge

or press enter if a docker bridge is not applicable.

Step 17 When prompted with **Are these values correct? (y/n),** confirm your entries with **y.**

Step 18 Confirm your entries.

Step 19 When prompted with **Would you like to setup the SDC now? (y/n)**, enter `n`.

Step 20 The VM console automatically logs you out.

Step 21 Create an SSH connection to the SDC. Login as: **cdo**and enter your password.

Step 22 At the prompt, type `sudo sdc-onboard bootstrap`.

```
[cdo@localhost ~]$ sudo sdc-onboard bootstrap
```

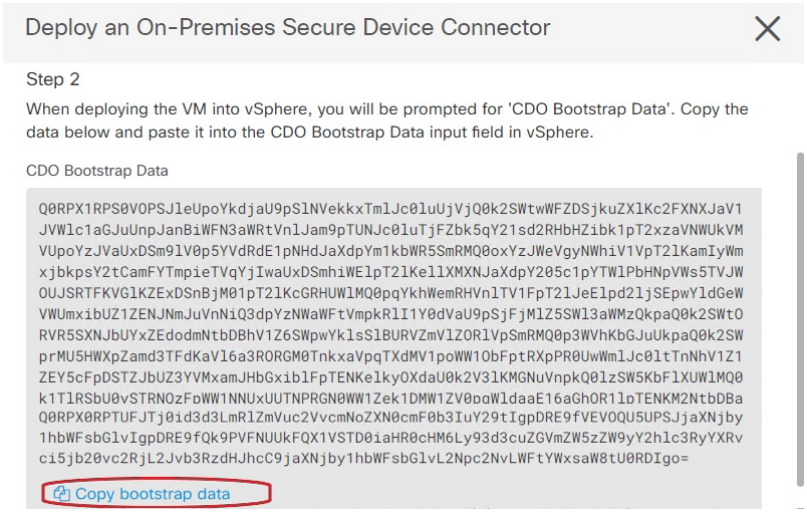
Step 23 When prompted with **[sudo] password**, enter the cdo password you created in Step 14.

Step 24 When prompted with **Please copy the bootstrap data form the Secure Connector Page of CDO**, follow this procedure:

a. Log into CDO.

b. In the Actions pane, click **Deploy an On-Premises Secure Device Connector**.

c. Click **Copy the bootstrap data** in step 2 of the dialog box and paste into the SSH window.



Step 25 When prompted with **Do you want to update these setting? (y/n)**, enter `n`.

Step 26 Return to the Secure Device Connector page. Refresh the screen until you see the status of your new SDC change to **Active**.

Deploy a Secure Device Connector on your own VM

When using device credentials to connect CDO to a device, it is a best practice to download and deploy a Secure Device Connector (SDC) in your network to manage the communication between CDO and the device. Typically, these devices are non-perimeter based, do not have a public IP address, or have an open port to the outside interface. Adaptive Security Appliances (ASAs), FDM-managed devices, and Firepower Management Centers (FMCs) devices can all be onboarded to CDO using device credentials.

The SDC monitors CDO for commands that need to be executed on your managed devices, and messages that need to be sent to your managed devices. The SDC executes the commands on behalf of CDO, sends messages to CDO on behalf of the managed devices, and returns replies from the managed devices to CDO.

The number of devices a single SDC can manage depends on the features implemented on those devices and the size of their configuration files. For the purposes of planning your deployment, however, we expect one SDC to support approximately 500 devices. See Using Multiple SDCs on a Single CDO Tenant, on page 33 for more information.

This procedure describes how to install an SDC in your network by using your own virtual machine image.

Note The preferred, easiest, and most reliable way to install an SDC is to download CDO's SDC OVA image and install it. See Deploy a Secure Device Connector Using CDO's VM Image, on page 15 for those instructions.

Before you begin

- CDO requires strict certificate checking and does not support a Web/Content Proxy between the SDC and the Internet.
- The SDC must have full outbound access to the Internet on TCP port 443 in order for it to communicate with CDO.
- Devices that reach CDO through the SDC must allow inbound access from the SDC on port 443.
- Review Connect Cisco Defense Orchestrator to your Managed Devices for networking guidelines.
- VMware ESXi host installed with vCenter web client or ESXi web client.

Note We do not support installation using the vSphere desktop client.

- ESXi 5.1 hypervisor.
- Cent OS 7 guest operating system.
- System requirements for a VM with only an SDC:
  - VMware ESXi host needs 2 CPUs.
  - VMware ESXi host needs a minimum of 2 GB of memory.
  - VMware ESXi requires 64 GB disk space to support the virtual machine depending on your provisioning choice. This value assumes you are using Logical Volume Management (LVM) with the partition so you can expand required disk space as needed.

- System requirements for a VM with an SDC and **a single** Secure Event Connector (SEC) for your tenant. (The SEC is a component used in Cisco Security Analytics and Logging).

  Each SEC you add to the VMware ESXi host requires an additional 4 CPUs and an additional 8 GB of memory.

  Therefore, these are the requirements for a VMware ESXi host with one SDC and one SEC:

  - VMware ESXi host needs 6 CPU.
  - VMware ESXi host needs a minimum of 10 GB of memory.
  - VMware ESXi requires 64 GB disk space to support the virtual machine depending on your provisioning choice.

- After you have updated the CPU and memory on the VM, power on the VM and ensure that the Secure Connectors page indicates that the SDC is in the "Active" state.
- Users performing this procedure should be comfortable working in a Linux environment and using the vi visual editor for editing files.
- If you are installing your on-premise SDC on a CentOS virtual machine, we recommend you install Yum security patches on a regular basis. Depending on your Yum configuration, to acquire Yum updates, you may need to open outbound access on port 80 as well as 443. You will also need to configure yum-cron or crontab to schedule the updates. Work with your security-operations team to determine if any security policies need to change to allow you to get the Yum updates.

Note **Before you get started**: Do not copy and paste the commands in the procedure into your terminal window, type them instead. Some commands include an "n-dash" and in the cut and paste process, these commands can be applied as an "m-dash" and that may cause the command to fail.

Procedure

Step 1 Log on to the CDO tenant you are creating the SDC for.

Step 2 From the CDO menu, choose **Tools & Services** > **Secure Connectors**.

Step 3 On the **Services** page, select the **Secure Connectors** tab, click the blue plus button, and select **Secure Device Connector**.

Step 4 Copy the bootstrap data in step 2 on the window to a notepad.

Step 5 Install a **CentOS 7 virtual machine** with at least the following RAM and disk space allotted to the SDC:

- 8GB of RAM
- 10GB disk space

Step 6 Once installed, configure basic networking such as specifying the IP address for the SDC, the subnet mask, and gateway.

Step 7 Configure a DNS (Domain Name Server) server.

Step 8 Configure a NTP (Network Time Protocol) server.

Step 9 Install an SSH server on CentOS for easy interaction with SDC's CLI.

Step 10 Run a Yum update and then install the packages: **open-vm-tools**, **nettools**, and **bind-utils**

```
[root@sdc-vm ~]# yum update -y
                 [root@sdc-vm ~]# yum install -y open-vm-tools net-tools bind-utils
```

Step 11 Install the AWS CLI package; see https://docs.aws.amazon.com/cli/latest/userguide/awscli-install-linux.html.

Note Do not use the **--user** flag.

Step 12 Install the Docker CE packages; see https://docs.docker.com/install/linux/docker-ce/centos/#install-docker-ce

Note Use the "Install using the repository" method.

Step 13 Start the Docker service and enable it to start on boot:

```
[root@sdc-vm ~]# systemctl start docker
[root@sdc-vm ~]# systemctl enable docker
Created symlink from /etc/systemd/system/multiuser.target.wants/docker.service to
    /usr/lib/systemd/system/docker.service.
```

Step 14 Create two users: "cdo" and "sdc." The cdo user will be the one you log in to run administrative functions (so you don't need to use the root user directly), and the sdc user will be the user to run the SDC docker container.

```
[root@sdc-vm ~]# useradd cdo
[root@sdc-vm ~]# useradd sdc -d /usr/local/cdo
```

Step 15 Set a password for the cdo user.

```
[root@sdc-vm ~]# passwd cdo
Changing password for user cdo.
New password: <type password>
Retype new password: <type password>
passwd: all authentication tokens updated successfully.
```

Step 16 Add the cdo user to the "wheel" group to give it administrative (sudo) privileges.

```
[root@sdc-vm ~]# usermod -aG wheel cdo
[root@sdc-vm ~]#
```

Step 17 When Docker is installed, there is a user group created. Depending on the version of CentOS/Docker, this may be called either "docker" or "dockerroot". Check the /etc/group file to see which group was created, and then add the sdc user to this group.

```
[root@sdc-vm ~]# grep docker /etc/group
 docker:x:993:
[root@sdc-vm ~]#
[root@sdc-vm ~]# usermod -aG docker sdc
[root@sdc-vm ~]#
```

Step 18 If the /etc/docker/daemon.json file does not exist, create it, and populate with the contents below. Once created, restart the docker daemon.

Note Make sure that the group name entered in the "group" key matches the group you found in the /etc/group file the previous step.

```
[root@sdc-vm ~]# cat /etc/docker/daemon.json
         {
```

```
    "live-restore": true,
    "group": "docker"
}
[root@sdc-vm ~]# systemctl restart docker
[root@sdc-vm ~]#
```

Step 19 If you are currently using a vSphere console session, switch over to SSH and log in with the "cdo" user. Once logged in, change to the "sdc" user. When prompted for a password, enter the password for the "cdo" user.

```
[cdo@sdc-vm ~]$ sudo su sdc
                [sudo] password for cdo: <type password for cdo user>
                [sdc@sdc-vm ~]$
```

Step 20 Change directories to **/usr/local/cdo**.

Step 21 Create a new file called `bootstrapdata` and paste the bootstrap data from Step 2 of the **Deploy an On-Premises Secure Device Connector** wizard into this file. **Save** the file. You can use `vi` or `nano` to create the file.

Step 22 The bootstrap data comes encoded in base64. Decode it and export it to a file called `extractedbootstrapdata`

```
[sdc@sdc-vm ~]$ base64 -d /usr/local/cdo/bootstrapdata > /usr/local/cdo/extractedbootstrapdata

                [sdc@sdc-vm ~]$
```

Run the cat command to view the decoded data. The command and decoded data should look similar to this:

```
[sdc@sdc-vm ~]$ cat /usr/local/cdo/extractedbootstrapdata
                CDO_TOKEN="<token string>"
                CDO_DOMAIN="www.defenseorchestrator.com"
                CDO_TENANT="<tenant-name>"

CDO_BOOTSTRAP_URL="https://www.defenseorchestrator.com/sdc/bootstrap/tenant-name/<tenant-name-SDC>"
```

Step 23 Run the following command to export the sections of the decoded bootstrap data to environment variables.

```
[sdc@sdc-vm ~]$ sed -e 's/^/export /g' extractedbootstrapdata > sdcenv && source sdcenv
                [sdc@sdc-vm ~]$
```

Step 24 Download the bootstrap bundle from CDO.

```
[sdc@sdc-vm ~]$ curl -O -H "Authorization: Bearer $CDO_TOKEN" "$CDO_BOOTSTRAP_URL"
                100 10314 100 10314 0 0 10656 0 --:--:-- --:--:-- --:--:-- 10654
                [sdc@sdc-vm ~]$ ls -l /usr/local/cdo/*SDC
                -rw-rw-r--. 1 sdc sdc 10314 Jul 23 13:48 /usr/local/cdo/tenant-name-SDC
```

Step 25 Extract the SDC tarball, and run the `bootstrap.sh` file to install the SDC package.

```
[sdc@sdc-vm ~]$ tar xzvf /usr/local/cdo/tenant-name-SDC
                <snipped - extracted files>
                [sdc@sdc-vm ~]$
                [sdc@sdc-vm ~]$ /usr/local/cdo/bootstrap/bootstrap.sh
                [2018-07-23 13:54:02] environment properly configured
                download: s3://onprem-sdc/toolkit/prod/toolkit.tar to toolkit/toolkit.tar
                toolkit.sh
                common.sh
                [2018-07-23 13:54:04] startup new container
                Unable to find image 'ciscodefenseorchestrator/sdc_prod:latest' locally
                sha256:d98f17101db10e66db5b5d6afda1c95c29ea0004d9e4315508fd30579b275458:
Pulling from
                ciscodefenseorchestrator/sdc_prod
                08d48e6f1cff: Pull complete
                ebbd10b629b1: Pull complete
                d14d580ef2ed: Pull complete
                45421d451ab8: Pull complete
```

```
<snipped - downloads>
no crontab for sdc
```

The SDC should now show "Active" in CDO.

What to do next

-
- Return to Install a Secure Event Connector on an SDC Virtual Machine if you are installing a Secure Event Connector.
- Return to Install Multiple SECs for your tenant, if you are installing your **second or more** Secure Event Connectors on your tenant.

Deploy Secure Device Connector and Secure Event Connector on Ubuntu Virtual Machine

When using device credentials to connect CDO to a device, it is a best practice to download and deploy a Secure Device Connector (SDC) in your network to manage the communication between CDO and the device. Typically, these devices are non-perimeter based, do not have a public IP address, or have an open port to the outside interface. Adaptive Security Appliances (ASAs), FDM-managed devices, and Firepower Management Centers (FMCs) devices can all be onboarded to CDO using device credentials.

The SDC monitors CDO for commands that must be executed on your managed devices, and messages that must be sent to your managed devices. The SDC executes the commands on behalf of CDO, sends messages to CDO on behalf of the managed devices, and returns replies from the managed devices to CDO.

The Secure Event Connector (SEC) forwards events from ASA and FTD to the Cisco cloud so that you can view them on the Event Logging page and investigate them with Secure Cloud Analytics, depending on your licensing.

After deploying the SDC, adding an SEC container becomes a simple task. The SEC service is designed to receive syslog messages from ASA, Cisco IOS and FDM-managed devices, and send them securely to the Cisco cloud. This allows eventing services like CDO Analytics and Cisco XDR to store, augment, and analyze the log messages with ease.

You can execute the scripts that are provided on the CiscoDevNet site to install the SDC and SEC on Linux Ubuntu systems.

Before you begin

- CDO requires strict certificate checking and does not support a Web/Content Proxy between the SDCand the Internet.
- The SDC must have full outbound access to the Internet on TCP port 443.
- Review Connect Cisco Defense Orchestrator to your Managed Devices for networking guidelines.
- VMware ESXi host that is installed with vCenter web client or ESXi web client.

Note We do not support installation using the vSphere desktop client.

- ESXi 5.1 hypervisor.
- Ubuntu operating system version 20.04 or above is installed on the virtual machine.

  SDC:
  - CPU: 2 Cores
  - RAM: Minimum of 2 GB

  SDC and SEC:
  - CPU: 4 Cores
  - RAM: Minimum of 8 GB
- The Ubuntu machine running the SDC must have network access to the management interfaces of the ASAs and Cisco IOS devices.

Procedure

Step 1 Log on to the CDO tenant you are creating the SDC for.

Step 2 Choose **Tools & Services** > **Secure Connectors**.

Step 3 On the **Services** page, select the **Secure Connectors** tab, click the +, and select **Secure Device Connector**.

Step 4 Copy the bootstrap data in step 2 on the window to a notepad.

Step 5 Open CiscoDevNet to Deploy SDC.

Step 6 Click **Code** and copy the URL in the **HTTPS** tab.

Step 7 On the Ubuntu system. press Ctrl+Alt+T to quickly open the terminal window.

Step 8 In the terminal, type **git** and paste the HTTPS URL copied earlier.

```
[sdc@vm]:~$ git https://github.com/CiscoDevNet/cdo-deploy-sdc.git
Resolving deltas: 100% (22/22). done.
```

Step 9 Go to the "cdo-deploy-sdc" directory.

```
[sdc@vm]:~$ cd cdo-deploy-sdc.
```

Step 10 Execute **ls -la** to see the files and scripts.

- **delete_sdc.sh**: Deletes SDC previously installed on your system.
- **deploy_sdc.sh**: Deploys SDC on your system.
- **install_docker.sh**: Deploys the recommended version of docker on your system.

Step 11 Run the script to install the docker.

```
[sdc@vm]:~/cdo-deploy-sdc$ ./install_docker.sh
```

```
Remove docker docker.io docker-compose docker-compose-v2 docker-doc podmand-docker {y/n] n
Active: active (running) since date time UTC; 32s ago
Adding the current user to the docker permmissions group
Done!
```

Step 12 Run the script to deploy SDC.

Enter **./deploy_sdc.sh** and paste the bootstrap data that is copied from the CDO UI.

```
[sdc@vm]:~/cdo-deploy-sdc$ ./deploy_sdc.sh <bootstap data>.
```

```
If the docker container is up and running, the status of the SDC should go to 'ACtive' in
the CDO Event Connectors panel.
```

The Secure Device Connector must now show "Active" in CDO.

What to do next

-
- Go to Deploy Secure Event Connector on Ubuntu Virtual Machine to install a Secure Event Connector.

Deploy a Secure Device Connector to vSphere Using Terraform

Before you begin

This procedure details how you can use the CDO SDC Terraform module for vSphere in conjunction with the CDO Terraform Provider to deploy an SDC to your vSphere. Ensure you review the following prerequisites before attempting to perform this task procedure:

- You require a vSphere datacenter version 7 and above
- You require an admin account on the datacenter with permissions to do the following:
  - Create VMs
  - Create folders
  - Create content libraries
  - Upload files to content libraries
- Terraform knowledge

Procedure

Step 1 Create an API-only user in CDO and copy the API token. To know how to create an API-only user, see Create API Only Users.

Step 2 Configure the CDO Terraform provider in your Terraform repository by following the instructions in CDO Terraform Provider.

Example:

```
terraform {
  required_providers {
```

```
    cdo = {
      source = "CiscoDevNet/cdo"
      version = "0.7.0"
    }
  }
}

provider "cdo" {
  base_url = "<the CDO URL you use to access CDO>"
  api_token = "<the API Token generated in step 1>"
}
```

Step 3 Write Terraform code to create a `cdo_sdc` resource using the CDO Terraform provider. See the Terraform registry for cdo-sdc resource for more information.

Example:

```
Resource "cdo_sdc" "my-sdc" {
  name = "my-sdc-in-vsphere"
}
```

The `bootstrap_data` attribute of this resource is populated with the value of the CDO bootstrap data and is provided to the `cdo_sdc` Terraform module in the next step.

Step 4 Write Terraform code to create the SDC in vSphere using cdo_sdc Terraform module.

Example:

```
data "cdo_tenant" "current" {}

module "vsphere-cdo-sdc" {
  source               = "CiscoDevNet/cdo-sdc/vsphere"
  version              = "1.0.0"
  vsphere_username     = "<replace-with-username-with-admin-privileges>"
  vsphere_password     = "<super-secure-password>"
  vsphere_server       = "<replace-with-address-of-vsphere-server>"
  datacenter           = "<replace-with-datacenter-name>"
  resource_pool        = "<replace-with-resource-pool-name>"
  cdo_tenant_name      = data.cdo_tenant.current.human_readable_name
  datastore            = "<replace-with-name-of-datastore-to-deploy-vm-in>"
  network              = "<replace-with-name-of-network-to-deploy-vm-in>"
  host                 = "<replace-with-esxi-host-address>"
  allow_unverified_ssl = <boolean; set to true if your vsphere server does not have a valid
 SSL certificate>
  ip_address          = "<sdc-vm-ip-address; must be in the subnet of the assigned network
 for the VM>"
  gateway              = "<replace-with-network-gateway-address>"
  cdo_user_password    = "<replace-with-password-for-cdo-user-in-sdc-vm>"
  root_user_password   = "<replace-with-password-for-root-user-in-sdc-vm>"
  cdo_bootstrap_data   = cdo_sdc.sdc-in-vsphere.bootstrap_data
}
```

Note that the VM created has two users—a `root` user and a user called `cdo`—and the IP Address of the VM is configured statically. The `cdo_bootstrap_data` attribute is given the value of the `bootstrap_data` attribute generated when the `cdo_sdc` resource is created.

Step 5 Plan and apply your Terraform using `terraform plan` and `terraform apply`, as you would normally.

See the CDO Automation Repository in the CiscoDevNet for a complete example.

If your SDC stays in the onboarding state, connect to the vSphere VM using remote console, log in as the CDO user, and execute the following command:

```
sudo su
/opt/cdo/configure.sh startup
```

Note The CDO Terraform modules are published as Open Source Software under the Apache 2.0 license. You can file issues on GitHub if you require support.

Deploy a Secure Device Connector on an AWS VPC Using a Terraform Module

Before you begin

Review these prerequisites before attempting to deploy an SDC on your AWS VPC:

- CDO requires strict certificate checking and does not support Web/Content Proxy inspection between the SDC and the Internet. If using a proxy server, disable inspection for traffic between the Secure Device Connector (SDC) and CDO.
- Review Connect Cisco Defense Orchestrator to your Managed Devices to ensure proper network access.
- You require an AWS account, an AWS VPC with at least one subnet, and an AWS Route53-hosted zone.
- Ensure you have the CDO bootstrap data, your AWS VPC ID, and its subnet ID handy.
- Ensure that the private subnet to which you deploy the SDC has a NAT gateway attached.
- Open traffic on the port on which your firewall management HTTP interface is running, from your firewalls to the Elastic IP attached to the NAT gateway.

Procedure

Step 1 Add the following lines of code in your Terraform file; make sure you manually enter inputs for variables:

```
module "example-sdc" {
  source              =
"git::https://github.com/cisco-lockhart/terraform-aws-cdo-sdc.git?ref=v0.0.1"
  env                 = "example-env-ci"
  instance_name       = "example-instance-name"
  instance_size       = "r5a.xlarge"
  cdo_bootstrap_data = "<replace-with-cdo-bootstrap-data>"
  vpc_id              = <replace-with-vpc-id>
  subnet_id           = <replace-with-private-subnet-id>
}
```

See the Secure Device Connector Terraform module for a list of input variables and descriptions.

Step 2 Register `instance_id` as an output in your Terraform code:

```
output "example_sdc_instance_id" {
  value = module. example-sdc.instance_id
}
```

You can use the `instance_id` to connect to the SDC instance for troubleshooting using the AWS Systems Manager Session Manager (SSM). See Outputs in the Secure Device Connector Terraform module for a list of available outputs.

What to do next

For any troubleshooting of your SDC, you need to connect to the SDC instance using AWS SSM. See AWS Systems Manager Session Manager to know more about how to connect to your instance. Note that the ports to connect to the SDC instance using SSH are not exposed because of security reasons.

Note The CDO Terraform modules are published as Open Source Software under the Apache 2.0 license. You can file issues on GitHub if you require support.

Configure a Secure Device Connector to Use Proxy

Using a proxy server can enhance security by acting as an intermediary that filters outbound traffic. It prevents direct exposure of your network devices to the internet and reduces the risk of attacks. A proxy server can be integrated with the Secure Device Connector (SDC) for all outbound communications from the SDC to CDO.

Before you begin

- Familiarity with the Linux command-line interface (CLI) is required.
- This procedure focuses on modifying the Docker container configuration specific to the SDC, not the host Linux OS settings.
- The changes affect only the SDC's Docker container. Configure the proxy settings for the host Linux system according to your organization's standard procedures for Linux servers.
- Cisco recommends creating backup of your config.json file before editing it.

Procedure

Step 1 Access the SDC via SSH and switch to the SDC user using the command:

```
$ sudo su - sdc
```

Step 2 Navigate to the configuration file at `/usr/local/cdo/data/<your_sdc_name>/data/config.json`.

Step 3 Insert the JSON key-value pair into the config.json file.

```
"awsProxy":"https://proxy:port"
```

Replace proxy with your proxy server's IP address or FQDN, and port with the proxy server's listening port.

Step 4 Save the changes and restart the SDC container. You can do this by either restarting the Docker container directly or by rebooting the virtual machine hosting the SDC.

a) To restart the Docker container, first identify the SDC container ID using the command:

```
[sdc@localhost cdo] $ docker ps
```

b) Restart the container using the command:

```
[sdc@localhost cdo] $ docker restart <container_id>
```

where <container_id> is the ID of the SDC container.

Step 5 Confirm that the SDC container has restarted successfully and is operational. You can check the status of the container using the command:

```
[sdc@localhost cdo] $ docker ps | grep sdc
```

In the log file, verify that the proxy settings are in effect using the command:

```
[sdc@localhost cdo] $ less /usr/local/cdo/data/<your_sdc_name>/logs/lar.log
```

The SDC is successfully configured to communicate using the proxy server.

Change the IP Address of a Secure Device Connector

Before you begin

- You must be an admin to perform this task.
- The SDC must have full outbound access to the Internet on TCP port 443, or the port you have configured for device management.

Note You will not be required to re-onboard any devices to CDO after changing the SDC's IP address.

Procedure

Step 1 Create an SSH connection to your SDC or open your virtual machine's console, and log in as the CDO user.

Step 2 If you wish to view your SDC VM's network interface configuration information before changing the IP address, use the `ifconfig` command.

```
[cdo@localhost ~]$ ifconfig
```

Step 3 To change the IP address of the interface, type `sudo sdc-onboard setup` command.

```
[cdo@localhost ~]$ sudo sdc-onboard setup
```

Step 4 Enter your password at the prompt.

```
[sudo] password for cdo:
```

Step 5 Type `n` at the prompt for resetting the root and CDO passwords.

```
Would you like to reset the root and cdo passwords? (y/n):
```

Step 6 Type `y` at the prompt for reconfiguring the network.

```
Would you like to re-configure the network? (y/n):
```

Step 7 Enter the new IP address you wish to assign to your SDC and the other domain information of the SDC VM when prompted:

a) IP Address
b) Gateway
c) DNS Server
d) NTP Server or FQDN

or press enter if an NTP server or FQDN is not applicable.

e) Docker Bridge

or press enter if a docker bridge is not applicable.

Step 8 Confirm your entries with `y` when prompted for the correctness of the values.

```
Are these values correct? (y/n):
```

Note Make sure your values are accurate before typing `y`, because your SSH connection to the old IP address will be lost after this command.

Step 9 Create an SSH connection using the new IP address you assigned to your SDC and log in.

Step 10 You can run the connectivity status test command to ensure that your SDC is up and running.

```
[cdo@localhost ~]$ sudo sdc-onboard status
```

All the checks must say `[ OK ]` in green.

Note If you are performing this procedure in the VM's console, once you confirm the values are correct, the connectivity status test is automatically run and the status shown.

Step 11 You can also check your SDC's connectivity through the CDO user interface. To do that, open the CDO application and navigate to **Tools & Services** > **Secure Connectors** page.

Step 12 Refresh the page once and select the secure connector whose IP address you changed.

Step 13 On the **Actions** pane, click **Request Heartbeat**.

You should see the **Hearbeat requested successfully** message, and the **Last Heartbeat** should display the current date and time.

Important The IP address change you made gets reflected on the SDC's **Details** pane only after 3:00 AM GMT.

See Deploy a Secure Device Connector on your own VM, on page 19 for information on deploying an SDC on your VM.

Remove a Secure Device Connector

Warning This procedure deletes your Secure Device Connector (SDC). It is not reversible. After taking this action, you will not be able to manage the devices connected to that SDC until you install a new SDC and reconnect your devices. Reconnecting your devices may requires you to re-enter the administrator credentials for each device you need to reconnect.

To remove the SDC from your tenant, follow this procedure:

Procedure

Step 1 Remove any devices connected to the SDC you want to delete.

- **a.** See CDO Devices that Use the Same SDC to identify all the devices used by the SDC.
- **b.** In the **Inventory** page, select all the devices you identified.
- **c.** In the Device Actions pane, click **Remove** and click **OK** to confirm your action.

Step 2 From the CDO menu, choose **Tools & Services** > **Secure Connectors**.

Step 3 On the **Services** page with the **Secure Connectors** tab selected, click the blue plus button and select **Secure Device Connector**.

Step 4 In the Secure Connectors table, select the SDC you want to remove. Its device count should now be zero.

Step 5 In the Actions pane, click **Remove**. You receive this warning:

Warning You are about to delete <sdc_name>. Deleting the SDC is not reversible. Deleting the SDC will require you to create and onboard a new SDC before you can onboard, or re-onboard, your devices.

Because you currently have onboarded devices, removing the SDC will require you to reconnect those devices and provide credentials again after setting up a new SDC.

- If you have any questions or concerns, click **Cancel** and contact CDO support.
- If you wish to proceed, enter <sdc_name> in the text box below and click **OK**.

Step 6 In the confirmation dialog box, if you wish to proceed, enter your SDC's name as it is stated in the warning message.

Step 7 Click **OK** to confirm the SDC removal.

Move an ASA from one SDC to Another

CDO Using Multiple SDCs on a Single CDO Tenant. You can move a managed ASA from one SDC to another using this procedure:

Procedure

Step 1 In the navigation bar, click **Inventory**.

Step 2 Click the **Devices** tab and then click the **ASA** tab.

Step 3 Select the ASA or ASAs you want to move to a different SDC.

Step 4 In the **Device Actions** pane, click **Update Credentials**.

Step 5 Click the Secure Device Connector button and select the SDC you want to move the device to.

Step 6 Enter the administrator username and password CDO uses to log into the device and click **Update**. Unless they were changed, the administrator username and password are the same credentials you used to onboard the ASA. You do not have to deploy these changes to the device.

Note If all the ASAs use the same credentials, you can move ASAs in bulk from one SDC to another. If the ASAs have different credentials, you have to move them from one SDC to another one at a time.

Rename a Secure Device Connector

Procedure

Step 1 From the CDO menu, choose **Tools & Services** > **Secure Connectors**.

Step 2 Select the SDC you want to rename.

Step 3 In the Details pane, click the edit icon next to the name of the SDC.

Step 4 Rename the SDC.

This new name will appear wherever the SDC name appears in the CDO interface including the Secure Device Connectors filter of the **Inventory** pane.

Update your Secure Device Connector

Use this procedure as a troubleshooting tool. Ordinarily, the SDC is updated automatically and you should not have to use this procedure. However, if the time configuration on the VM is incorrect, the SDC cannot establish a connection to AWS to receive the updates. This procedure will initiate an update of the SDC and should resolve errors due to time synchronization problems.

Procedure

Step 1 Connect to your SDC. You can connect using SSH or use the console view in your VMware Hypervisor.)

Step 2 Log in to the SDC as the **cdo** user.

Step 3 Switch to the SDC user in order to update the SDC docker container:

```
[cdo@sdc-vm ~]$ sudo su sdc
                [sudo] password for cdo: <type password for cdo user>
                [sdc@sdc-vm ~]$
```

Step 4 Upgrade the SDC toolkit:

```
[cdo@sdc-vm ~]$ /usr/local/cdo/toolkit/toolkit.sh upgradeToolkit
                [sdc@sdc-vm ~]$
```

Step 5 Upgrade the SDC:

```
[cdo@sdc-vm ~]$ /usr/local/cdo/toolkit/toolkit.sh upgradeSDC
                [sdc@sdc-vm ~]$
```

Using Multiple SDCs on a Single CDO Tenant

Deploying more than one SDC for your tenant allows you to manage more devices without experiencing performance degradation. The number of devices a single SDC can manage depends on the features implemented on those devices and the size of their configuration files.

You can install an unlimited number of SDCs on a tenant. Each SDC could manage one network segment. These SDCs would connect the devices in those network segments to the same CDO tenant. Without multiple SDCs, you would need to manage the devices in isolated network segments with different CDO tenants.

The procedure for deploying a second or subsequent SDC is the same for deploying your first SDC. Deploy a Secure Device Connector Using CDO's VM Image or you can Deploy a Secure Device Connector on your own VM. The initial SDC for your tenant incorporates the name of your tenant and the number 1. Each additional SDC is numbered in order.

CDO Devices that Use the Same SDC

Follow this procedure to identify all the devices that connect to CDO using the same SDC:

Procedure

Step 1 In the navigation bar, click **Inventory**.

Step 2 Click the **Devices** tab to locate the device.

Step 3 Click the appropriate device type tab.

Step 4 If there is any filter criteria already specified, click the **clear** button at the top of the Inventory table to show all the devices and services you manage with CDO.

Step 5 Click the filter button to expand the Filters menu.

Step 6 In the Secure Device Connectors section of the filter, check the name of the SDC(s) you're interested in. The Inventory table displays only the devices that connect to CDO through the SDC you checked in the filter.

Step 7 (Optional) Check additional filters in the filter menu to refine your search further.

Step 8 (Optional) When you're done, click the **clear** button at the top of the Inventory table to show all devices and services you manage with CDO.

Open Source and Third-Party License in SDC

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*** amqplib ***

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Michael Bridgen <mikeb@squaremobius.net>

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*** async ***

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*** bluebird ***

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*** cheerio ***

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*** command-line-args ***

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*** json-buffer ***

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*** json-stable-stringify ***

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*** json-stringify-safe ***

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*** log4js ***

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*** mkdirp ***

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*** node-forge ***

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*** rimraf ***

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*** uuid ***

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Devices, Software, and Hardware Supported by CDO

Cisco Defense Orchestrator (CDO) is a cloud-based management solution enabling the management of security policies and device configurations across multiple security platforms. CDO centrally manages policy and configuration across:

- Cisco Secure Firewall ASA, both on-premises and virtual
- Cisco Secure Firewall Threat Defense (FTD), both on-premises and virtual
- Cisco Secure Firewall Management Center, on-premises
- Cisco Meraki MX
- Cisco IOS devices
- Cisco Umbrella
- AWS Security Groups

The documentation describes devices, software, and hardware CDO supports. It does not point out software and devices that CDO does not support. If we do not explicitly claim support for a software version or a device type, then we do not support it.

Cisco Secure Firewall ASA

Cisco Adaptive Security Appliance (ASA) is a security device integrating firewall, VPN, and intrusion prevention capabilities. It protects networks from unauthorized access, cyber threats, and data breaches, offering robust security services in a single platform. CDO supports the management of ASA devices, offering features to streamline configuration management and ensure regulatory compliance across the network infrastructure.

Cisco Secure Firewall Threat Defense

Firewall Threat Defense integrates traditional firewall features with advanced threat protection capabilities. It offers comprehensive security functions, including intrusion prevention, application control, URL filtering, advanced malware protection, and so on. An FTD can be deployed on ASA hardware appliances, and Cisco firewall hardware appliances, and in virtual environments. Managing threat defense devices is possible through various management interfaces, such as Cisco Firewall Management Center, Cisco Defense Orchestrator, and Firewall Device Manager.

For more information on software and hardware compatibility, see the Cisco Secure Firewall Threat Defense Compatibility Guide.

Firewall Device Manager is a web-based management interface explicitly designed for threat defense device management. It provides a simplified approach for configuring and monitoring threat defense devices, making it ideal for smaller-scale deployments or organizations preferring an intuitive interface.

FDM offers basic configuration capabilities for network settings, access control policies, NAT rules, VPN configuration, monitoring, and basic troubleshooting. Typically accessed through a web browser, FDM is directly available on the FTD device, eliminating the need for additional management servers or appliances.

Cisco Secure Firewall Management Center

CDO simplifies the management of on-premises Firewall Management Center by establishing a secure integration, discovering device inventories, and enabling centralized policy management. Security policies such as firewall rules, VPN settings, and intrusion prevention policies can be efficiently managed and deployed across all devices under FMC.

Cisco Meraki MX

The Meraki MX appliance is an enterprise-grade security and SD-WAN next-generation firewall appliance, designed for decentralized deployments. CDO supports managing layer 3 network rules on Meraki MX devices. When you onboard a Meraki device to CDO, it communicates with the Meraki dashboard to manage that device. CDO securely transfers configuration requests to the Meraki dashboard, which then applies the new configuration to the device. Key features of CDO's support for Cisco Meraki MX include centralized policy management, backup and restore, monitoring and reporting, compliance checking, and automation capabilities.

Cisco IOS Devices

Cisco IOS can manage and control network functions, including routing, switching, and other networking protocols. It offers a set of features and commands to configure and maintain Cisco network devices, enabling efficient communication and management within networks of varying sizes and complexities.

Cisco Umbrella

CDO manages Cisco Umbrella through integrations such as the Umbrella ASA Integration, which allows administrators to include their Cisco Adaptive Security Appliance (ASA) within their Umbrella configuration using per-interface policies. This integration enables the ASA to redirect DNS queries to Umbrella, enhancing network security by leveraging Umbrella's DNS security, web filtering, and threat intelligence capabilities.

AWS Security Groups

CDO offers a simplified management interface for Amazon Web Services (AWS) Virtual Private Clouds (VPCs). Key features include monitoring AWS Site-to-Site VPN connections, tracking changes to AWS devices, and viewing AWS Site-to-Site VPN tunnels.

Secure Firewall Threat Defense Device Support Specifics

Secure Firewall Threat Defense is Cisco's next generation firewall. It can be installed on a variety of hardware and virtual platforms; see the Cisco Secure Firewall Threat Defense Compatibility Guide.

Threat Defense with Secure Firewall Device Manager

You can add CDO managment to threat defense Version 6.4+ with device manager. However, this option is only available upon request for those who already have device manager support enabled on their tenant. See:

- Open a Support Ticket with TAC to request this option.
- Managing FDM Devices with Cisco Defense Orchestrator to review the supported features.
- Onboard FDM-Managed Devices for a full discussion of onboarding prerequisites and requirements.
- Guidelines and Limitations for Firepower Interface Configuration for CDO limitations.

Snort

Snort 3 is the default inspection engine for threat defense starting in threat defense Version 6.7 (with device manager) and Version 7.0 (with management center).

Important If you are still using the Snort 2 inspection engine, switch to Snort 3 now for improved detection and performance. Snort 2 will be deprecated in a future release and will eventually prevent threat defense upgrade.

Browsers Supported in CDO

CDO supports the latest version of these browsers:

- Google Chrome
- Mozilla Firefox

CDO Platform Maintenance Schedule

CDO Maintenance Schedule

CDO updates its platform every week with new features and quality improvements. Updates can be made during a 3 hour period according to this schedule.

Table 1: CDO Maintenance Schedule

Day of the Week	Time of Day (24-hour time)
Thursday	09:00 UTC - 12:00 UTC

During this maintenance period, you can still access your tenant and if you have a cloud-delivered Firewall Management Center, you can access that platform as well. Additionally, the devices you have onboarded to CDO continue to enforce their security policies.

Note We advise you not to use CDO to deploy configuration changes on the devices it manages during maintenance periods.

If there is a failure that stops CDO or cloud-delivered Firewall Management Center from communicating, that failure is addressed on all affected tenants as quickly as possible even if it is outside the maintenance window.

Cloud-delivered Firewall Management Center Maintenance Schedule

Customers who have a cloud-delivered Firewall Management Center deployed on their tenant are notified approximately 1 week before CDO updates the cloud-delivered Firewall Management Center environment. Super-admin and Admin users of the tenant are notified by email. CDO also displays a banner on its home page notifying all users of upcoming updates.

The update to your tenant may take up to 1 hour and occurs within the 3 hour maintenance period on the maintenance day assigned to your tenant's region. While your tenant is being updated, you will not be able to

access the cloud-delivered Firewall Management Center environment, but you will still be able to access the rest of CDO.

Table 2: Cloud-delivered Firewall Management Center Maintenance Schedule

Day of the Week	Time of Day (24-hour time)	Region
Wednesday	04:00 UTC - 07:00 UTC	Europe, the Middle East, or Africa (EMEA)
Wednesday	17:00 UTC - 20:00 UTC	Asia-Pacific-Japan (APJ)
Thursday	09:00 UTC - 12:00 UTC	Americas

Manage a CDO Tenant

Cisco Defense Orchestrator (CDO) gives you the ability to customize certain aspects of your tenant and individual user accounts on the Settings page. From the CDO menu bar, click **Settings** in the left navigation panel.

General Settings

From the admin drop-down in the upper right, click **Settings**.

See the following topics regarding general CDO Settings:

- User Settings, on page 46
- For **My Tokens**, see API Tokens, on page 55
- For **Tenant Settings**, see:
  - Enable Change Request Tracking, on page 47
  - Prevent Cisco Support from Viewing your Tenant, on page 47
  - Enable the Option to Schedule Automatic Deployments, on page 48
  - Default Conflict Detection Interval, on page 48
  - Web Analytics, on page 49
  - Configure a Default Recurring Backup Schedule, on page 49
  - Tenant ID, on page 49
  - Tenant Name, on page 50

User Settings

Select the desired language for the CDO UI to display in. This selection only affects the user that makes this change.

My Tokens

See API Tokens for more information.

Tenant Settings

Enable Change Request Tracking

Enabling change request tracking affects all users of your tenant. To enable Change Request Tracking, follow this procedure:

Procedure

Step 1 From the admin drop-down in the upper right, click **Settings**.

Step 2 Click the **General** tab.

Step 3 Click the slider under **Change Request Tracking**.

Once confirmed, you see the Change Request toolbar appear in the lower left corner of the interface and the Change Request drop-down menu in the Change Log.

Prevent Cisco Support from Viewing your Tenant

Cisco support will associate its users with your tenant to resolve support tickets or proactively fix issues that affect more than one customer. However, if you prefer, you can prevent Cisco support from accessing your tenant by changing your account settings. To do so, slide the button under "Prevent Cisco support from viewing this tenant" to show a green check mark.

To prevent Cisco support from viewing your tenant, follow this procedure:

Procedure

Step 1 From the admin drop-down in the upper right, click **Settings**.

Step 2 Click the **General** tab.

Step 3 Click the slider under **Prevent Cisco support from viewing this tenant**.

Enable the Option to Auto-accept Device Changes

Enabling auto-accept for device changes allows Defense Orchestrator to automatically accept any changes made directly on the device. If you leave this option disabled, or disable it at a later time, you are required to review each device conflict before you can accept it.

To enable auto-accept for device changes, follow this procedure:

Procedure

Step 1 From the admin drop-down in the upper right, click **Settings**.

Step 2 Click the **General** tab.

Step 3 Click the slider under **Enable the option to auto-accept device changes**.

Default Conflict Detection Interval

This interval determines how often CDO polls onboarded devices for changes. This selection affects all devices managed with this tenant, and can be changed at any time.

Note This selection can be overridden via the **Conflict Detection** option available from the **Inventory** page after you have selected one or multiple devices.

To configure this option and select a new interval for conflict detection, follow this procedure:

Procedure

Step 1 From the admin drop-down in the upper right, click **Settings**.

Step 2 Click the **General Settings** tab.

Step 3 Click the drop-down menu for **Default Conflict Detection Interval** and select a time value.

Enable the Option to Schedule Automatic Deployments

Enabling the option to schedule automatic deployments allows you to schedule future deployments at a date and time when it is convenient. Once enabled, you can schedule a single or a recurring automatic deployment. To schedule an automatic deployment, see Schedule an Automatic Deployment.

Note that changes made on CDO for a device are not automatically deployed to the device if it has pending changes of its own . If a device is not in the **Synced** state, such as **Conflict Detected** or **Not Synced**, scheduled deployments are not executed. The jobs page lists any instance where a scheduled deployment fails.

If **Enable the Option to Schedule Automatic Deployments** is turned off, all scheduled deployments are deleted.

Important If you use CDO to create more than one scheduled deployment for a device, the new deployment overwrites the existing deployment. If you create more than one scheduled deployment a device using API, you **must** delete the existing deployment prior to schedule the new deployment.

To enable the option to schedule automatic deployments, follow this procedure:

Procedure

Step 1 From the admin drop-down in the upper right, click **Settings**.

Step 2 Click the **General Settings** tab.

Step 3 Click the slider under **Enable the option to schedule automatic deployments**.

Web Analytics

Web analytics provides anonymous product usage information to Cisco based on page hits. The information includes pages viewed, the time spent on a page, browser versions, product version, device hostname, and so forth. This information can help Cisco determine feature usage patterns and help Cisco improve the product. All usage data is anonymous and no sensitive data is transmitted.

Web analytics is enabled by default. To disable web analytics, or to enable in the future, follow this procedure:

Procedure

Step 1 From the admin drop-down in the upper right, click **Settings**.

Step 2 Click the **General Settings** tab.

Step 3 Click the slider under **Web Analytics**.

Configure a Default Recurring Backup Schedule

To make backup schedules across your devices consistent, use this setting to configure your own default recurring backup schedule. When you schedule a backup for a particular device, you can use the default settings or change them. Changing the default recurring backup schedule does not change any existing scheduled backups or recurring backup schedules.

Procedure

Step 1 In the **Frequency** field, select daily, weekly, or monthly backup.

Step 2 Select the time of day, in 24-hour time, you want the backup to occur. Note that you schedule the time in Coordinated Universal Time (UTC).

- For weekly backups: Check the days of the week on which you want the backup to occur.
- For monthly backups: Click in the **Days of Month** field and add whichever days of the month you want to the schedule the backup. Note: If you enter day 31 but a month doesn't have 31 days in it, the backup will not take place. Give the scheduled backup time a name and a description.

Step 3 Click **Save**.

See Configure a Recurring Backup Schedule for a Single FTD for additional information.

Tenant ID

Your tenant ID identifies your tenant. This information will be helpful if you need to contact the Cisco Technical Assistance Center (TAC).

Tenant Name

Your tenant name also identifies your tenant. Note that the tenant name is not the organization name. This information will be helpful if you need to contact the Cisco Technical Assistance Center (TAC).

Tenant Notification Settings

Notifications are generated by CDO whenever a device associated with your tenant experiences a specific action, a device certificate is expiring or has expired, or a background log search starts, finishes or fails. While these notifications are applied to all the devices associated with your tenant, not all device types support all of the available options. For example, background log search is only applicable for tenants who signed up for event logging.

From the navigation bar to the left, click **Settings** > **Notification Settings**.

Note You must have an **Super Admin** user role to change these settings. See User Roles in CDO for more information.

Email Subscribers

Add or modify the emails that receive alerts from your CDO tenant. See Enable Email Subscribers, on page 50 for more information.

Service Integrations

Enable Incoming Webhooks on your messaging app and receive CDO notifications directly to your app dashboard. See Enable Service Integrations for CDO Notifications for more information.

Enable Email Subscribers

An email notification from CDO denotes the type of action and the affected devices. For further information about the current state of your devices and the content of the action, we recommend logging into CDO and examining the Change Log of the affected devices.

Warning Be sure to enter the correct email if you are adding a mailer. CDO does not check email addresses against known users associated with your tenant.

Add an Email Subscription

Before you begin

You must be an **Admin** to view the email subscription list, and a **SuperAdmin** to add, remove, or edit email subscriptions.

Procedure

Step 1 Log into CDO and navigate to **Settings** > **Notification Settings**.

Step 2 Click the + icon in the upper right corner of the page.

Step 3 Enter a valid email address in the text field.

Step 4 Check and uncheck the appropriate checkboxes for events and alerts you want the subscriber to notified about.

Step 5 Click **Save**. At any point, click **Cancel** to creating the new email subscription for the tenant.

Edit Email Subscriptions

Before you begin

You must be an **Admin** to view the email subscription list, and a **SuperAdmin** to add, remove, or edit email subscriptions.

Procedure

Step 1 Log into CDO and navigate to **Settings** > **Notification Settings**.

Step 2 Locate the email addres you want to enable to edit for email subscriptions.

Step 3 Click the **Edit** icon.

Step 4 Edit the following attributes:

- Email address
- Send Alerts When.… Device Workflows
- Send Alerts When... Device Events
- Send Alerts When... Background Log Search

Step 5 Click **Ok**. At any point, click **Cancel** to negate any changes made to the email subscription.

Delete an Email Subscription

Use the following procedure to delete a mailer from the email subscription list.:

Before you begin

You must be an **Admin** to view the email subscription list, and a **SuperAdmin** to add, remove, or edit email subscriptions.

Procedure

Step 1 Log into CDO and navigate to **Settings** > **Notification Settings**.

Step 2 Locate the user you want to remove from email subscriptions for the tenant.

Step 3 Click the **Remove** icon for the user you want to remove.

Step 4 Confirm you want to remove the user from the subscription list. Note that this does not affect the user functionality in any way.

Enable Service Integrations for CDO Notifications

Enable service integration to forward CDO notifications through a specified messaging application or service. You need to generate a webhook URL from your messaging application and point CDO to that webhook in CDO's **Notification Settings** page to receive notifications.

CDO natively supports Cisco Webex and Slack as service integrations. Messages sent to these services are specially formatted for channels and automated bots.

Note You must check the appropriate boxes for the notifications you want to receive per webhook.

Incoming Webhooks for Webex Teams

Before you begin

CDO notifications appear in a designated workspace or as an automated bot in a private message. For more information on how Webex Teams handles webhooks, see Webex for Developers for more information.

Use the following procedure to allow incoming webhooks for Webex Teams:

Procedure

Step 1 Open the Webex Teams application.

Step 2 In the lower left corner of the window, click the **Apps** icon. This action opens the Cisco Webex App Hub in new tab in your preferred browser.

Step 3 Use the search bar to find **Incoming Webhooks**.

Step 4 Select **Connect**. This action opens an OAuth Authorization to allow the application in a new tab.

Step 5 Select **Accept**. The tab automatically redirects to the application's configuration page.

Step 6 Configure the following:

- **Webhook name** - Provide a name to identify the messages provided by this application.
- **Select a space** - Use the drop-down menu to choose a **Space**. The Space must already exist in Webex team. If a space does not exist, you can create a new space in Webex Teams and refresh the application's configuration page to display the new space.

Step 7 Select **Add**. The Webex Space you chose will receive a notification that the application is added.

Step 8 Copy the Webhook URL.

Step 9 Log into CDO.

Step 10 From the navigation bar to the left, click **Settings** > **Notification Settings**.

Step 11 Examine and confirm the notifications that are checked are correct. If they are not, we strongly recommend modifiying the notification selection before you connect to a service integration.

Step 12 Scroll to **Service Integrations**.

Step 13 Click the blue plus button.

Step 14 Enter a **Name**. This name appears in CDO as a configured service integration. It does not appear in any events forwarded to the configured service.

Step 15 Expand the drop-down menu and select **Webex** as the Service Type.

Step 16 Paste the webhook URL that you generated from the service.

Step 17 Click **OK**.

Incoming Webhooks for Slack

CDO notifications appear in a designated channel or as an automated bot in a private message. For more information on how Slack handles incoming webhooks, see Slack Apps for more information.

Use the following procedure to allow incoming webhooks for Slack:

Procedure

Step 1 Log into your Slack account.

Step 2 In the panel to the left, scroll to the bottom and select **Add Apps**.

Step 3 Search application directory for **Incoming Webhooks** and locate the app. Select **Add**.

Step 4 If you are not the admin of your Slack workspace, you must send a request to the admin of your org and wait for the app to be added to your account. Select **Request Configuration**. Enter an optional message and select **Submit Request**.

Step 5 Once the Incoming Webhooks app is enabled for your workspace, refresh the Slack settings page and select **Add New Webhook to Workspace**.

Step 6 Use the drop-down menu to select the Slack channel you want the CDO notifications to appear in. Select **Authorize**. If you navigate away from this page while waiting for the request to get enabled, simply log into Slack and select the workspace name in the upper left corner. From the drop-down menu, select **Customize Workspace** and select **Configure Apps**. Navigate to **Manage** > **Custom Integrations**. Select **Incoming Webhooks** to open app's landing page and then select **Configuration**from the tabs. This lists all the users within your workspace that has this app enabled. You can only see and edit your account's configuration. Select your workspace name to edit the configuration and move forward.

Step 7 The Slack settings page redirects you to the configuration page for the app. Locate and copy the webhook URL.

Step 8 Log into CDO.

Step 9 From the navigation bar to the left, click **Settings** > **Notification Settings**.

Step 10 Examine and confirm the notifications that are checked are correct. If they are not, we strongly recommend modifiying the notification selection before you connect to a service integration.

Step 11 Scroll to **Service Integrations**.

Step 12 Click the blue plus button.

Step 13 Enter a **Name**. This name appears in CDO as a configured service integration. It does not appear in any events forwarded to the configured service.

Step 14 Expand the drop-down menu and select **Slack** as the Service Type.

Step 15 Paste the webhook URL that you generated from the service.

Step 16 Click OK.

Incoming Webhooks for a Custom Integration

Before you begin

CDO does not format messages for custom integration. If you opt to integrate a custom service or application, CDO sends a JSON message.

Refer to the service's documentation on how to enable incoming webhooks and generate a webhook URL. Once you have a webhook URL, use the procedure below to enable webhooks:

Procedure

Step 1 Generate and copy the webhook URL from the custom service or application of your choice.

Step 2 Log into CDO.

Step 3 From the navigation bar to the left, click **Settings** > **Notification Settings**.

Step 4 Examine and confirm the notifications that are checked are correct. If they are not, we strongly recommend modifiying the notification selection before you connect to a service integration.

Step 5 Scroll to **Service Integrations**.

Step 6 Click the blue plus button.

Step 7 Enter a **Name**. This name appears in CDO as a configured service integration. It does not appear in any events forwarded to the configured service.

Step 8 Expand the drop-down menu and select **Custom** as the Service Type.

Step 9 Paste the webhook URL that you generated from the service.

Step 10 Click OK.

Logging Settings

View your monthly event logging limit and how many days are left until the limit resets. Note that stored logging represents the compressed event data that the Cisco cloud received.

Click **View Historical Usage** to see all of the logging your tenant has received over the past 12 months.

There are also links you can use to request additional storage.

Integrate Your SAML Single Sign-On with Cisco Defense Orchestrator

Cisco Defense Orchestrator (CDO) uses Cisco Secure Sign-On as its SAML single sign-on identity provider (IdP) and Duo Security for multifactor authentication (MFA). This is CDO's preferred authentication method.

If, however, customers want to integrate their own SAML single sign-on IdP solution with CDO, they can as long as their IdP supports SAML 2.0 and identity provider-initiated workflow.

To integrate your own or third-party identity provider (IdP) with Cisco Security Cloud Sign On, see Cisco Security Cloud Sign On Identity Provider Integration Guide.

If you need more support to integrate your own SAML solution with CDO, contact support and create a case.

Attention When you open a case, ensure that you choose **Manually Select A Technology** and select **SecureX - Sign-on and Administration** for your request to reach the right team.

Renew SSO Certificate

Your Identity Provider (IdP) is usually integrated with SecureX SSO. Open a Cisco TAC case and provide the metadata.xml file. For more information, see Cisco SecureX Sign-On Third-Party Identity Provider Integration Guide.

Attention When you open a case, ensure that you choose **Manually Select A Technology** and select **SecureX - Sign-on and Administration** for your request to reach the right team.

(legacy only) If your Identity Provider (IdP) integration is directly with CDO, open a support ticket with CDO TAC and provide the metadata.xml file.

API Tokens

Developers use CDO API tokens when making CDO REST API calls. The API token must be inserted in the REST API authorization header for a call to succeed. API tokens are "long-lived" access tokens which do not expire; however, you can renew and revoke them.

You can generate API tokens from within CDO. These tokens are only visible immediately after they're generated and for as long as the General Settings page is open. If you open a different page in CDO and return to the **General Settings** page, the token is no longer visible, although it is clear that a token has been issued.

Individual users can create their own tokens for a particular tenant. One user cannot generate a token on behalf of another. Tokens are specific to an account-tenant pair and cannot be used for other user-tenant combinations.

API Token Format and Claims

The API token is a JSON Web Token (JWT). To learn more about the JWT token format, read the Introduction to JSON Web Tokens.

The CDO API token provides the following set of claims:

- **id** - user/device uid
- **parentId** - tenant uid
- **ver** - the version of the public key (initial version is 0, for example, **cdo_jwt_sig_pub_key.0**)
- **subscriptions** - Security Services Exchange subscriptions (optional)
- **client_id** - "**api-client**"
- **jti** - token id

Token Management

Generate an API Token

Procedure

Step 1 From the navigation bar to the left, click **Settings** > **General Settings**.

Step 2 In My Tokens, click **Generate API Token**.

Step 3 Save the token in a secure location in accordance with your enterprise's best practices for maintaining sensitive data.

Renew an API Token

The API token does not expire. However, users may choose to renew their API token if the token is lost, compromised, or to conform to their enterprise's security guidelines.

Procedure

Step 1 From the navigation bar to the left, click **Settings** > **General Settings**.

Step 2 In My Tokens, click **Renew**. CDO generates a *new* token.

Step 3 Save the new token in a secure location in accordance with your enterprise's best practices for maintaining sensitive data.

Revoke an API Token

Procedure

Step 1 From navigation bar to the left, click **Settings** > **General Settings**.

Step 2 In My Tokens, click **Revoke**. CDO revokes the token.

Relationship Between the Identity Provider Accounts and Cisco Defense Orchestrator User Records

To log in to Cisco Defense Orchestrator (CDO), a customer needs an account with a SAML 2.0-compliant identity provider (IdP), a multi-factor authentication provider, and a user record in CDO. The IdP account contains the user's credentials and the IdP authenticates the user based on those credentials. Mutli-factor authentication provides an added layer of identity security. The CDO user record primarily contains the username, the CDO tenant with which they are associated, and the user's role. When a user logs in, CDO tries to map the IdP's user ID to an existing user record on a tenant in CDO. When CDO finds a match, the user is logged in to that tenant.

Unless your enterprise has its own single sign-on identity provider, your identity provider is Cisco Security Cloud Sign On. Cisco Security Cloud Sign On uses Duo for mutli-factor authentication. Customers can Integrate Your SAML Single Sign-On with Cisco Defense Orchestrator if they choose.

Login Workflow

This is a simplified description of how the IdP account interacts with the CDO user record to log in a CDO user:

Procedure

Step 1 The user requests access to CDO by logging in to a SAML 2.0-compliant identity provider (IdP) such as Cisco Security Cloud Sign On (https://sign-on.security.cisco.com) for authentication.

Step 2 The IdP issues a SAML assertion that the user is authentic and a portal displays the applications the user can access such as tiles representing https://defenseorchestrator.com or https://defenseorchestrator.eu or https://www.apj.cdo.cisco.com/.

Step 3 CDO validates the SAML assertion, extracts the username and attempts to find a user record among its tenants that corresponding to that username.

- If the user has a user record on a single tenant on CDO, CDO grants the user access to the tenant and the user's role determines the actions they can take.
- If the user has a user record on more than one tenant, CDO presents the authenticated user with a list of tenants they can choose from. The user picks a tenant and is allowed to access the tenant. The user's role on that specific tenant determines the actions they can take.
- If CDO does not have a mapping for the authenticated user to a user record on a tenant, CDO displays a landing page giving users the opportunity to learn more about CDO or request a free trial.

Creating a user record in CDO does not create an account in the IdP and creating an account in the IdP does not create a user record in CDO.

Similarly, deleting an account on the IdP does not mean you have deleted the user record from CDO; although, without the IdP account, there is no way to authenticate a user to CDO. Deleting the CDO user record does not mean you have deleted the IdP account; although, without the CDO user record, there will be no way for an authenticated user to access a CDO tenant.

Implications of this Architecture

Customers Who Use Cisco Security Cloud Sign On

For customers who use CDO's Cisco Security Cloud Sign On identity provider, a Super Admin can create a user record in CDO and a user can self-register themselves with CDO. If the two usernames match, and the user is properly authenticated, the user can log in to CDO.

Should the Super Admin ever need to prevent a user from accessing CDO, they can simply delete the CDO user's user record. The Cisco Security Cloud Sign On account will still exist and if the Super Admin ever wants to restore the user, they can by creating a new CDO user record with the same username as the one used for Cisco Security Cloud Sign On.

Should a customer ever run into a problem with CDO that requires a call to our Technical Assistance Center (TAC), the customer could create a user record for the TAC engineer so they could investigate the tenant and report back to the customer with information and suggestions.

Customers Who Have Their Own Identity Provider

For Integrate Your SAML Single Sign-On with Cisco Defense Orchestrator, they control both the identity provider accounts and the CDO tenants. These customers can create and manage identity provider accounts and user records in CDO.

Should they ever need to prevent a user from accessing CDO, they can delete the IdP account, the CDO user record, or both.

If they ever need help from Cisco TAC, they can create both the identity provider account and a CDO user record, with a read-only role, for their TAC engineer. The TAC engineer would then be able to access the customer's CDO tenant, investigate, and report back the customer with information and suggestions.

Cisco Managed Service Providers

If Cisco Managed Service Providers (MSPs) use CDO's Cisco Security Cloud Sign On IdP, they can self-register for Cisco Security Cloud Sign On and their customers can create a user record for them in CDO so that the MSP can manage the customer's tenant. Of course, the customer has full control to delete the MSP's record when they choose to.

Related Topics

- General Settings
- Manage Users in CDO
- User Roles in CDO

Manage Multi-Tenant Portal

CDO Multi-Tenant Portal view retrieves and displays information from all devices across multiple tenants. This multi-tenant portal shows the device status, software versions running on them, and many more.

Note From the multi-tenant portal, you can add tenants across multiple regions and view devices those tenants manage. You cannot edit any tenants or configure any devices from the multi-tenant portal.

Before you begin

The multi-tenant portal is only available if the feature is enabled on your tenant. To enable multi-tenant portal for your tenant, open a support ticket with Cisco TAC. Once the support ticket is resolved and the portal is created, users with the **Super Admin** role on the portal have the ability to add tenants to it.

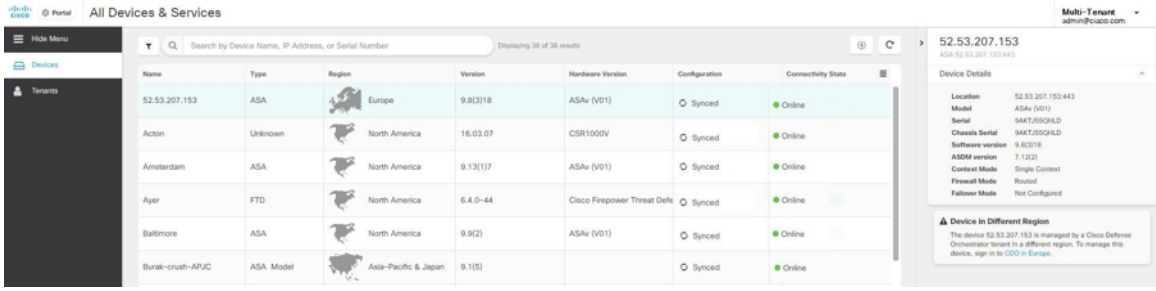
We recommend you clearing cache and cookies from your web browser to avoid certain browser-related issues that may occur.

The Multi-Tenant Portal

The portal provides the following menus:

- **Devices**:
  - Displays all the devices residing in the tenants added to the portal. Use the **Filter** and **Search** field to search devices that you want to view. You can click a device to view its status, the onboarding method, firewall mode, failover mode, software version, and many more.
  - The interface provides a column picker that allows you to select or clear the device properties to view in the table. Except for 'AnyConnect Remote Access VPN', all the other device properties are selected by default. If you customize the table, CDO remembers your selection the next time you sign in to CDO.
  - You can click on a device to see its details on the right.
  - You can export the portal's information to a comma-separated value (.csv) file. This information helps you to analyze the devices or send it to someone who doesn't have access. Every time you export the data, CDO creates a new .csv file, where the file created has a date and time in its name.
  - You can manage a device only from the CDO tenant that manages it. The multi-tenant portal provides the **Manage devices** link that directs you to the CDO tenant page. You'll see this link on the device if you have an account on that tenant, and the tenant is in the same region as the portal. If you don't have permission to access the tenant, you'll not see the Manage Devices link. You can contact a super-admin in your organization for permission.

Note If the tenant managing the device is in a different region, you'll see the link to sign in to CDO in that region. If you don't have access to CDO in that region or the tenant in that region, you'll not be able to manage the device.



- **Tenants**:
  - Displays the tenants added to the portal.
  - It allows a Super Admin user to add tenants to the portal.
  - You can click to view the CDO tenant's main page.

Add a Tenant to a Multi-Tenant Portal

A user with the Super Admin role can add tenants to the portal. You can add tenants across multiple regions. For example, you can add a tenant from the Europe region into the US region and conversely.

Important We recommend that you Create API Only Users for your tenant and generate an API token for authenticating to CDO.

Note If you want to add multiple tenants to the portal, generate API tokens from each tenant and paste them into a text file. You can then easily add the tenants one after another to the portal without switching to the tenant every time to generate a token.

Procedure

Step 1 From the navigation bar to the left, click **Settings** > **General Settings** > **My Tokens**.

Step 2 Click**Generate API Token** and then copy it.

Step 3 Go to the portal and click the **Tenants** tab.

Step 4 Click add the tenant button on the right.

Step 5 Paste the token and click **Save**.

Delete a Tenant from a Multi-Tenant Portal

Procedure

Step 1 Go to the portal and click the **Tenants** tab.

Step 2 Click the corresponding delete icon appearing on the right to remove the tenant that you want.

Step 3 Click **Remove**. The associated devices are also removed from the portal.

Manage-Tenant Portal Settings

Cisco Defense Orchestrator (Defense Orchestrator) gives you the ability to customize certain aspects of your Multi-Tenant Portal and individual user accounts on the Settings page. Access the settings page by clicking **Settings** in the navigation bar to the left.

Settings

General Settings

Web analytics provides anonymous product usage information to Cisco based on page hits. The information includes pages viewed, the time spent on a page, browser versions, product version, device hostname, and so forth. This information can help Cisco determine feature usage patterns and help Cisco improve the product. All usage data is anonymous, and no sensitive data is transmitted.

Web analytics is enabled by default. To disable web analytics or to enable in the future, follow this procedure:

1. From the CDO dashboard, click **Settings** in the navigation bar to the left.
2. Click **General Settings**.
3. Click the slider under **Web Analytics**.

User Management

You can see all the user records associated with the Mult-Tenant Portal on the **User Management** screen. You can add, edit, or delete a user account. For more information, see Manage Users in CDO.

Switch Tenant

If you have more than one portal tenants, you can switch between different portal or tenants without signing out from CDO.

Procedure

Step 1 On the multi-tenant portal, click your tenant menu appearing on the top right corner.

Step 2 Click **Switch tenant**.

Step 3 Choose the portal or tenant that you want to view.

The Cisco Success Network

Cisco Success Network is a user-enabled cloud service. When you enable Cisco Success Network, a secure connection is established between the device and the Cisco cloud to stream usage information and statistics. Streaming telemetry provides a mechanism to select data of interest from the device and to transmit it in a structured format to remote management stations for the following benefits:

- To inform you of available unused features that can improve the effectiveness of the product in your network.
- To inform you of additional technical support services and monitoring that might be available for your product.
- To help Cisco improve our products.

The device establishes and maintains the secure connection at all times, and allows you to enroll in the Cisco Success Network. After you have registered the device, you can change the Cisco Success Network setting.

Note

- For threat defense high availability pairs, the selection of the active device overrides the Cisco Success Network setting on the standby device.
- CDO does not manage the Cisco Success Network settings. The settings managed through, and telemetry information is provided by, the Firewall Device Manager user interface.

Enable or Disable the Cisco Success Network

During initial system setup, you are prompted to register the device with Cisco Smart Software Manager. If you instead elected to use the 90-day evaluation license, you must register the device before the end of the evaluation period. To enroll the device, either register the device with Cisco Smart Software Manager (on the Smart Licensing page) or enroll with CDO by entering a registration key.

When you register the device, your virtual account allocates the license to the device. Registering the device also registers any optional licenses that you have enabled.

You can turn off this connection at any time by disabling Cisco Success Network, although you can only disable this option through the Firewall Device Manager UI. Disabling will disconnect the device from the cloud. Disconnection does not impact the receipt of updates or the operation of the Smart Licensing capabilities, which continue to operate normally. See the **Connecting to the Cisco Success Network** section of the System Administration chapter of the Firepower Device Manager configuration Guide, Version 6.4.0 or later for more information.

Manage Users in CDO

Before you create or edit a user record in CDO, read Relationship Between the Identity Provider Accounts and Cisco Defense Orchestrator User Records to learn how the identity provider (IdP) account and the user record interact. CDO users need a CDO record and a corresponding IdP account so they can be authenticated and access your CDO tenant.

Unless your enterprise has it's own IdP, Cisco Secure Sign-On is the identity provider for all CDO tenants. The rest of this article assumes you are using Cisco Secure Sign-On as your identity provider.

You can see all the user records associated with your tenant on the **User Management** screen. This includes any Cisco support engineer temporarily associated with your account to resolve a support ticket.

View the User Records Associated with your Tenant

Procedure

From the CDOnavigation bar, click **Settings** > **User Management**.

Note To prevent Cisco support from accessing your tenant, configure your Account Settings in the General Settings page.

Active Directory Groups in User Management

For tenants that have a high turnover for large quantities of users, you can map CDO to your Active Directory (AD) groups instead of adding individual users to CDO for an easier way to manage your user lists and user roles. Any user changes, such as a new user addition or removing existing user(s), can now be done in Active Directory and no longer need to be done in CDO.

You must have a **SuperAdmin** user role to add, edit, or delete an AD group from the User Management page. See User Roles in CDO for more information.

Active Directory Groups Tab

The User Management section of the **Settings** page has a tab for Active Directory Groups that are currently mapped to CDO. Most importantly, this page displays the role of the AD group as assigned in your AD manager.

Users within an AD group are not listed individually in either the Active Directory Groups tab or the Users tab.

Audit Logs Tab

The User Management section of the **Settings** page has a tab for Audit Logs. This new section shows the last time of login of all users who accessed a CDO tenant, and the role(s) each user held at the time of last login. This includes both explicit user logins and AD group logins.

Multi-role Users

As an extension along the IAM capabilities in CDO, it is now possible for a user to have multiple roles.

A user can be part of multiple groups in AD, and each of those groups can be defined in CDO with different CDO roles. The final permissions a user gets on login are a combination of the roles of all the AD groups defined in CDO that the user is part of. For instance, if a user is part of two AD groups and both the groups are added in CDO with two different roles such as edit-only and deploy-only, the user would have both edit-only and deploy-only permissions. This applies to any number of groups and roles.

AD group mappings only need to be defined once in CDO, and managing access and permissions for users can subsequently be achieved exclusively in AD by adding, removing, or moving users between different groups.

Note If a user is both an individual user and part of an AD group on the same tenant, the user role of the individual user overrides the user role of the AD group.

Before You Begin

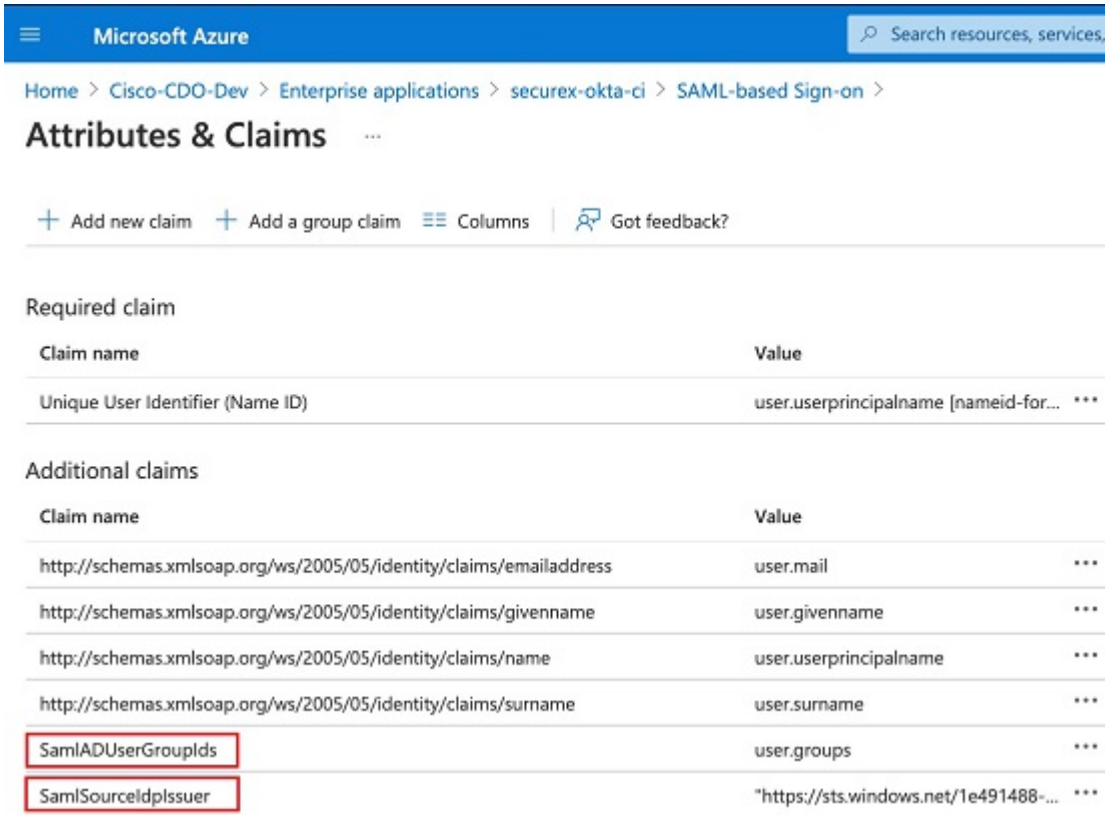
Prior to adding an AD group mapping to CDO as a form of user management, you must have your AD integrated with SecureX. If your AD Identity Provider (IdP) is not already integrated, open a Support Case with Cisco TAC and request a custom AD IdP integration with the following information:

- Your CDO tenant name and region
- Domain to define custom routing for (for example : @cisco.com, @myenterprise.com)
- Certificate and federation metadata in .XML format

After your AD integration is complete, add the following custom SAML claims in your AD. The SAML claims and attributes are required, for you to be able to successfully sign in to your CDO tenant after your AD integration is done. Note that these values are case sensitive:

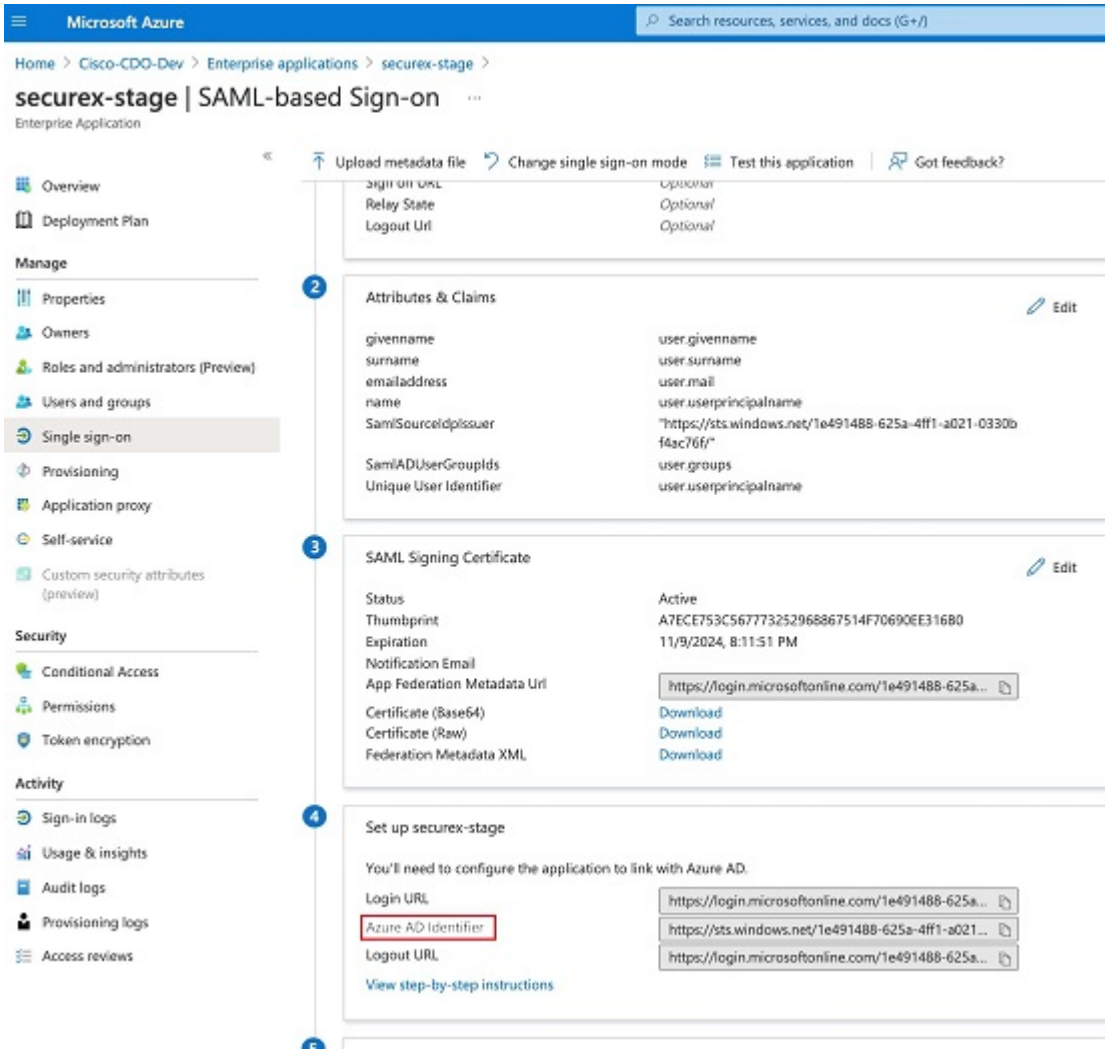
- **SamlADUserGroupIds** - This attribute describes all group associations a user has on AD. For example, in Azure select **+ Add a group claim** as seen in the screenshot below:

Figure 3: Custom Claims defined in Active Directory



- **SamlSourceIdpIssuer** - This attribute uniquely identifies an AD instance. For example, in Azure select**+ Add a group claim** and scroll to locate the Azure AD Identifier as seen in the screenshot below:

Figure 4: Locate the Azure Active Directory Identifier



Add an Active Directory Group for User Management

Procedure

Step 1 Log in to CDO.

Step 2 From the admin drop-down in the upper right, click **Settings**.

Step 3 Click the **User Management** tab.

Step 4 Select the **Active Directory Groups** tab at the top of the table.

Step 5 If there are no current AD groups, click **Add AD group**. If there are existing entries, click the Add button.

Step 6 Enter the following information:

- **Group Name** - Enter a unique name. This name does not have to match the group name in your AD. CDO does not support special characters for this field.
- **Group Identifier** - Manually enter the Group Identifier from your AD. The value of the group identifier should be the same as the group identifier in the custom claim definition. It could be any value that corresponds to the unique identity of the group, for example, my-favourite-group, 12345 and so forth.
- **AD Issuer** - Manually enter the AD Issuer value from your AD.
- **Role** - This determines the role for all the users included in this AD group. See User Roles for more information.
- (Optional) **Notes** - Add any notes that are applicable to this AD group.

Step 7 Select **OK**.

Edit an Active Directory Group for User Management

Before you begin

Note that editing an AD Group's user management in CDO only allows you to modify how CDO limits the AD group. You cannot edit the AD group itself in CDO. You must use AD to edit the list of users within an AD group.

Procedure

Step 1 Log in to CDO.

Step 2 From the admin drop-down in the upper right, click **Settings**.

Step 3 Click the **User Management** tab.

Step 4 Select the **Active Directory Groups** tab at the top of the table.

Step 5 Identify the AD Group you want to edit and select the **Edit** icon.

Step 6 Modify the following values:

- **Group Name** - Enter a unique name. CDO does not support special characters for this field.
- **Group Identifier** - Manually enter the Group Identifier from your AD. The value of the group identifier should be the same as the group identifier in the custom claim definition. It could be any value that corresponds to the unique identity of the group, for example, my-favourite-group, 12345 and so forth.
- **AD Issuer** - Manually enter the AD Issuer value from your AD.
- **Role** - This determines the role for all the users included in this AD group. See User Roles for more information.
- **Notes** - add any notes that are applicable to this AD group.

Delete an Active Directory Group for User Management

Procedure

Step 1 Log in to CDO.
Step 2 From the admin drop-down in the upper right, click **Settings**.
Step 3 Click the **User Management** tab.
Step 4 Select the **Active Directory Groups** tab at the top of the table.
Step 5 Identify the AD Group you want to delete.
Step 6 Select the **Delete** icon.
Step 7 Click **OK** to confirm you want to delete the AD group.

Create a New CDO User

These two tasks are required to create a new CDO user. They do not need to be performed sequentially:

- Create a Cisco Security Cloud Sign On Account for the New User
- Create a CDO User Record with Your CDO Username

After these tasks are done, then the user can The New User Opens CDO from the Cisco Secure Sign-On Dashboard.

Create a Cisco Security Cloud Sign On Account for the New User

Creating a Cisco Security Cloud Sign On account can be done at any time by the new user themselves. They do not need to know the name of the tenant they will be assigned to.

About Logging in to CDO

Cisco Defense Orchestrator(CDO) uses Cisco Secure Sign-On as its identity provider and Duo for multi-factor authentication (MFA). **To log into CDO, you must first create your account in Cisco Security Cloud Sign On and configure MFA using Duo**.

CDO requires MFA which provides an added layer of security in protecting your user identity. Two-factor authentication, a type of MFA, requires two components, or factors, to ensure the identity of the user logging into CDO. The first factor is a username and password, and the second is a one-time password (OTP), which is generated on demand.

Important **If your CDO tenant existed before October 14, 2019**, use Migrate to Cisco Security Cloud Sign On Identity Provider, on page 9 for log in instructions instead of this article.

Before you Log In

Install DUO Security. We recommend installing the Duo Security app on a mobile phone. Review Duo Guide to Two Factor Authentication: Enrollment Guide if you have questions about installing Duo.

Time Synchronization. You are going to use your mobile device to generate a one-time password. It is important that your device clock is synchronized with real time as the OTP is time-based. Make sure your device clock set automatically or manually set it to the correct time.

Create a New Cisco Security Cloud Sign On Account and Configure Duo Multi-factor Authentication

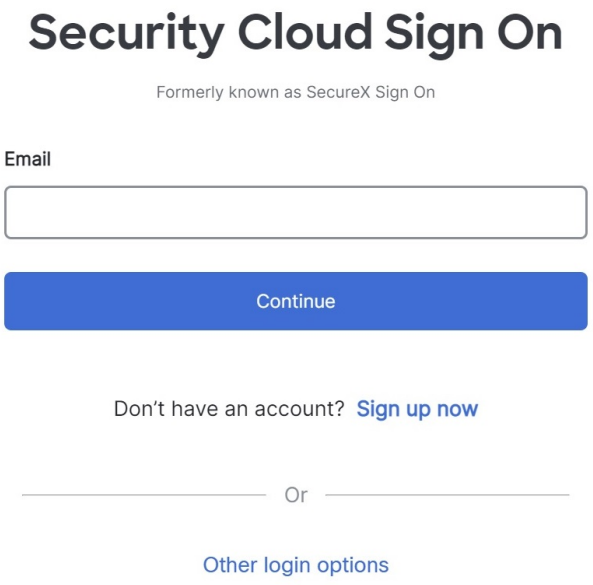
The initial sign-on workflow is a four-step process. You need to complete all four steps.

Procedure

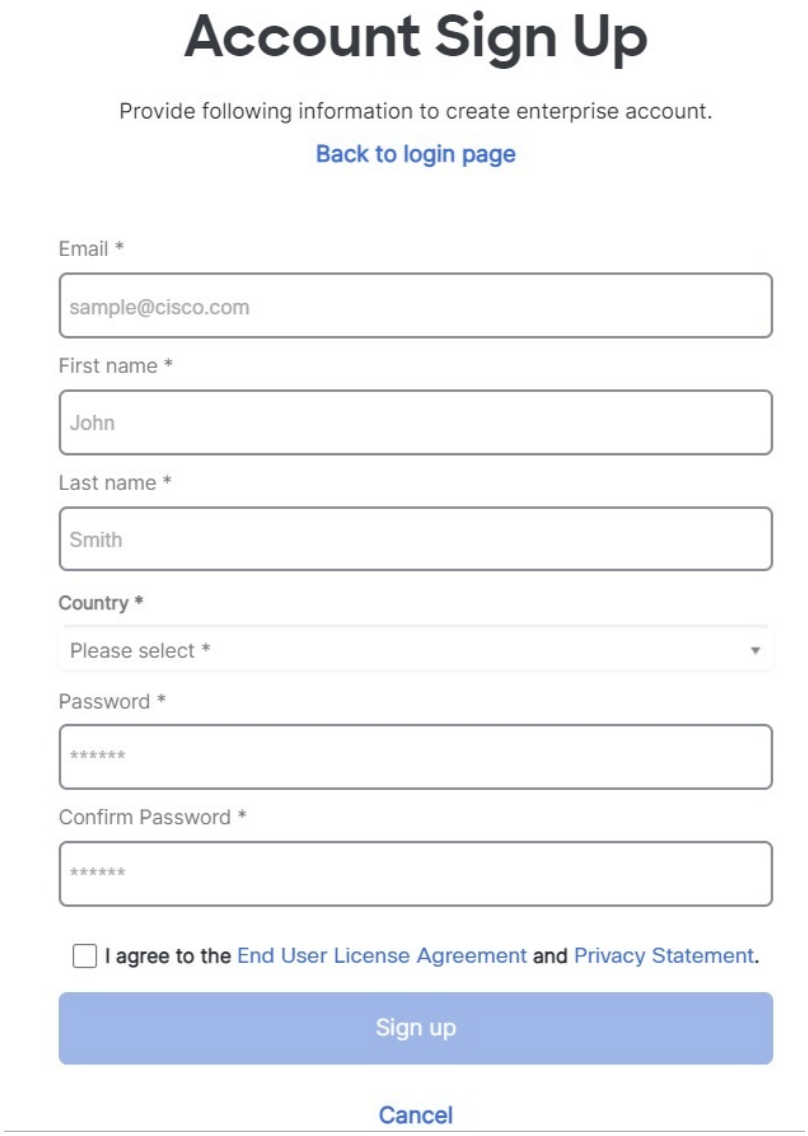
Step 1 **Sign Up for a New Cisco Security Cloud Sign On Account**.

a. Browse to https://sign-on.security.cisco.com.

b. At the bottom of the Sign In screen, click **Sign up now**.



c. Fill in the fields of the Create Account dialog.



Here are some tips:

- **Email**-Enter the email address that you will eventually use to log in to CDO.
- **Password**-Enter a strong password.

d. After you click **Create Account**.

Cisco sends you a verification email to the address you registered with. Open the email and click **Activate account**.

Step 2 **Set up Multi-factor Authentication Using Duo**

We recommend using a mobile device when setting up multi-factor authentication.

a. In the **Set up multi-factor authentication** screen, click **Configure factor**.

b. Click **Start setup** and follow the prompts to choose a mobile device and verify the pairing of that mobile device with your account.

For more information, see Duo Guide to Two Factor Authentication: Enrollment Guide. If you already have the Duo app on your device, you'll receive an activation code for this account. Duo supports multiple accounts on one device.

c. At the end of the wizard click **Continue to Login**.

d. Log in to Cisco Security Cloud Sign On with the two-factor authentication.

Step 3 **(Optional) Setup Google Authenticator as an additional authenticator**

a. Choose the mobile device you are pairing with Google Authenticator and click **Next**.

b. Follow the prompts in the setup wizard to setup Google Authenticator.

Step 4 **Configure Account Recovery Options for your Cisco Security Cloud Sign On**

a. Choose a recovery phone number for resetting your account using SMS.

b. Choose a security image.

c. Click **Create My Account**.

Create a CDO User Record with Your CDO Username

Only a CDO user with "Super Admin" privileges can create the CDO user record. The Super Admin should create the user record with the same email address that was specified in the **Create Your CDO Username** task above.

Use the following procedure to create a user record with an appropriate user role:

Procedure

Step 1 Login to CDO.

Step 2 From the CDO navigation bar, click **Settings** > **User Management**.

Step 3 Click the blue plus button ( ) to add a new user to your tenant.

Step 4 Provide the email address of the user.

Note The user's email address must correspond to the email address of the Cisco Secure Log-On account.

Step 5 Select the user's User Roles in CDO from the drop-down menu.

Step 6 Click **OK**.

The New User Opens CDO from the Cisco Secure Sign-On Dashboard

Procedure

Step 1 Click the appropriate **CDO** tile on the Cisco Secure Sign-on dashboard. The **CDO** tile directs you to https://defenseorchestrator.com and the **CDO (EU)** tile directs you to https://defenseorchestrator.eu.

Step 2 Click the authenticator logo to choose Duo Security or Google Authenticator if you have set up both authenticators.

- If you already have a user record on an existing tenant, you are logged into that tenant.
- If you already have a user record on several portals, you will be able to choose which portal to connect to.
- If you already have a user record on several tenants, you will be able to choose which CDO tenant to connect to.
- If you do not already have a user record on an existing tenant, you will be able to learn more about CDO or request a trial tenant.

The **Portals** view retrieves and displays consolidated information from multiple tenants. See Manage Multi-Tenant Portal for more information.

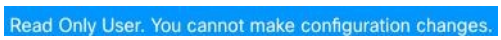
The **Tenant** view shows several tenants on which you have a user record.

User Roles in CDO

There are a variety of user roles in Cisco Defense Orchestrator (CDO): Read-Only, Edit-Only, Deploy-only, Admin, and Super Admin. User roles are configured for each user on each tenant. If a CDO user has access to more than one tenant, they may have the same user ID but different roles on different tenants. A user may have a read-only role on one tenant and a Super Admin role on another. When the interface or the documentation refers to a Read-only user, an Admin user, or a Super Admin user we are describing that user's permission level on a particular tenant.

Read-only Role

A user assigned the Read-Only role sees this blue banner on every page:



Users with the Read-Only role can do the following:

- View any page or any setting in CDO.
- Search and filter the contents of any page.
- Compare device configurations, view the change log, and see VPN mappings.
- View every warning regarding any setting or object on any page.
- Generate, refresh, and revoke their own API tokens. Note that if a read-only user revokes their own token, they cannot recreate it.
- Contact support through our interface and can export a change log.

Read-Only users **cannot** do the following:

- Create, update, configure, or delete anything on any page.
- Onboard devices.
- Step-through the tasks needed to create something like an object or a policy, but not be able to save it.
- Create CDO user records.
- Change user role.
- Attach or detach access rules to a policy.

Edit-Only Role

Users with the Edit-Only role can do the following:

- Edit and save device configurations, including but not limited to objects, policies, rulesets, interfaces, VPN, etc.
- Allow configuration changes that are made through the **Read Configuration** action.
- Utilize the Change Request Management action.

Edit-Only users **cannot** do the following:

- Deploy changes to a device or to multiple devices.
- Discard staged changes or changes that are detected through OOB.
- Upload AnyConnect Packages, or configure these settings.
- Schedule or manually start image upgrades for devices.
- Schedule or manually start a security database upgrade.
- Manually switch between Snort 2 and Snort 3 versions.
- Create a template.
- Change the existing OOB Change settings.
- Edit System Management settings.
- Onboard devices.
- Delete devices.
- Delete VPN sessions or user sessions.
- Create CDO user records.
- Change user role.

Deploy-Only Role

Users with the Deploy-Only role can do the following:

- Deploy staged changes to a device, or to multiple devices.
- Revert or restore configuration changes for ASA devices.
- Schedule or manually start image upgrades for devices.
- Schedule or manually start a security database upgrade.
- Utilize the Change Request Management action.

Deploy-Only users **cannot** do the following:

- Manually switch between Snort 2 and Snort 3 versions.
- Create a template.
- Change the existing OOB Change settings.
- Edit System Management settings.
- Onboard devices.
- Delete devices.
- Delete VPN sessions or user sessions.
- Create, update, configure, or delete anything on any page.

- Onboard devices.
- Step-through the tasks needed to create something like an object or a policy, but not be able to save it.
- Create CDO user records.
- Change user role.
- Attach or detach access rules to a policy.

VPN Sessions Manager Role

The VPN Sessions Manager role is designed for administrators monitoring remote access VPN connections, not site to site VPN connections.

Users with the VPN Sessions Manager role can do the following:

- View any page or any setting in CDO.
- Search and filter the contents of any page.
- Compare device configurations, view the change log, and see RA VPN mappings.
- View every warning regarding any setting or object on any page.
- Generate, refresh, and revoke their own API tokens. Note that if a VPN Sessions Manager user revokes their own token, they cannot recreate it.
- Contact support through our interface and export a change log.
- Terminate existing RA VPN sessions.

VPN Sessions Manager users **cannot** do the following:

- Create, update, configure, or delete anything on any page.
- Onboard devices.
- Step-through the tasks needed to create something like an object or a policy, but not be able to save it.
- Create CDO user records.
- Change user role.
- Attach or detach access rules to a policy.

Admin Role

Admin users have complete access to most aspects of CDO. Admin users can do the following:

- Create, read, update, and delete any object or policy in CDO and configure any setting.
- Onboard devices.
- View any page or any setting in CDO.
- Search and filter the contents of any page.

- Compare device configurations, view the change log, and see VPN mappings.
- View every warning regarding any setting or object on any page.
- Generate, refresh, and revoke their own API tokens. If their token is revoked, they can contact support through our interface and can export a change log.

Admin users **cannot** do the following:

- Create CDO user records.
- Change user role.

Super Admin Role

Super Admin users have complete access to all aspects of CDO. Super Admins can do the following:

- Change a user role.
- Create user records.

Note Though Super Admins can create a CDO user record, that user record is not all that is needed for a user to log in to your tenant. The user also needs an account with the identity provider used by your tenant. Unless your enterprise has its own single sign-on identity provider, your identity provider is Cisco Security Cloud Sign On. Users can self-register for their Cisco Security Cloud Sign On account; see Initial Login to Your New CDO Tenant, on page 8 for more information.

- Create, read, update, and delete any object or policy in CDO and configure any setting.
- Onboard devices.
- View any page or any setting in CDO.
- Search and filter the contents of any page.
- Compare device configurations, view the change log, and see VPN mappings.
- View every warning regarding any setting or object on any page.
- Generate, refresh, and revoke their own API tokens. If their token is revoked, they can
- Contact support through our interface and can export a change log.

Change The Record of the User Role

The user record is the currently recorded role of a user. By looking at the users associated with your tenant, you can determine what role each use has by their record. By changing a user role, you change the user record. User's roles are identified by their role in the User Management table. See Manage Users in CDO for more information.

You must be a Super Admin to change the user record. If your tenant has no Super Admins, contact Defense Orchestrator support.

Add a User Account to CDO

CDO users need a CDO record and a corresponding IdP account so they can be authenticated and access your CDO tenant. This procedure creates the user's CDO user record, not the user's account in Cisco Security Cloud Sign On. If the user does not have an account in Cisco Security Cloud Sign On, they can self-enroll by navigating to https://sign-on.security.cisco.com and clicking **Sign up** at the bottom of the Sign in screen.

Note You will need to have the role of Super Admin Role on CDO to perform this task.

Create a User Record

Use the following procedure to create a user record with an appropriate user role:

Procedure

Step 1 Log in to CDO.

Step 2 From the CDO navigation bar, click **Settings** > **User Management**.

Step 3 Click the blue plus button () to add a new user to your tenant.

Step 4 Provide the email address of the user.

Note The user's email address must correspond to the email address of the Cisco Secure Log-On account.

Step 5 Select the user's User Roles in CDO from the drop-down menu.

Step 6 Click **v**.

Note Though Super Admins can create a CDO user record, that user record is not all that is needed for a user to log in to your tenant. The user also needs an account with the identity provider used by your tenant. Unless your enterprise has its own single sign-on identity provider, your identity provider is Cisco Secure Sign-on. Users can self-register for their Cisco Secure Sign-On account; see Initial Login to Your New CDO Tenant, on page 8 for more information.

Create API Only Users

Procedure

Step 1 Log in to CDO.

Step 2 From the CDO navigation bar, click **Settings** > **User Management**.

Step 3 Click the blue plus button () to add a new user to your tenant.

Step 4 Select the **API Only User** checkbox.

Step 5 In the **Username** field, enter a name for the user and click **OK**.

Important the user name can't be an email address or contain the '@' character as the '@yourtenant' suffix will be automatically appended to the user name.

Step 6 Select the user's User Roles in CDO from the drop-down menu.

Step 7 Click **OK**.

Step 8 Click the **User Management** tab.

Step 9 In the **Token** column for the new API Only user, click **Generate API Token** to obtain an API token.

Edit a User Record for a User Role

You will need to have the role of Super Admin to perform this task. If the Super Admin changes the role of a CDO user that is logged in, once their role has been changed, the user is automatically logged out of their session. Once the user logs back in, they assume their new role.

Note You will need to have the role of Super Admin Role on CDO to perform this task.

Caution Changing the role of a user record will delete an API Tokens associated with the user record if there is one. The user must generate a new API token once the user role changes.

Edit a User Role

Note If a CDO user is logged in, and a Super Admin changes their role, the user must log out and log back in again for the change to take affect.

To edit the role defined in the user record, follow this procedure:

Procedure

Step 1 Log in to CDO.

Step 2 From the CDO navigation bar, click **Settings** > **User Management**.

Step 3 Click the edit icon in the user's row.

Step 4 Select the user's new User Roles in CDO from the Role drop-down menu.

Step 5 If the user record shows that there is an API token associated with the user, you will need to confirm that you want to change the user's role and delete the API token as a result.

Step 6 Click **v**.

Step 7 If CDO deleted the API token, contact the user so that they may create a new API Token.

Delete a User Record for a User Role

Deleting a user record in CDO prevents the associated user from logging in to CDO by breaking the mapping of the user record with the Cisco Security Cloud Sign On account. When you delete a user record, you are also deleting the API token associated with that user record should there be one. Deleting a user record in CDO does not delete the user's IdP account in Cisco Security Cloud Sign On.

Note You will need to have the role of Super Admin Role on CDO to perform this task.

Delete a User Record

To delete the role defined in the user record, see the following procedure:

Procedure

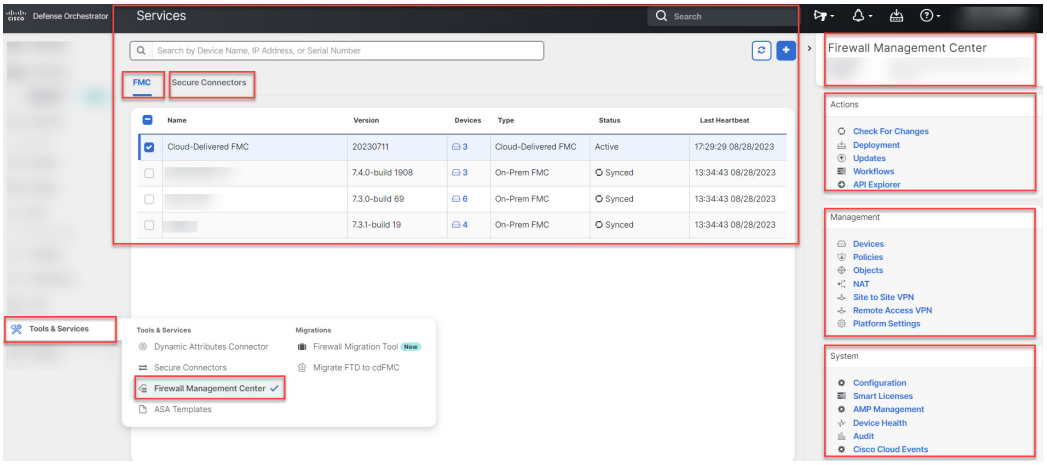
Step 1 Log in to CDO.
Step 2 From the CDO navigation bar, click **Settings** > **User Management**.
Step 3 Click the trash can icon in the row of the user you want to delete.
Step 4 Click **OK**.
Step 5 Confirm that you want to remove the account from the tenant by clicking OK.

CDO Services Page

The **Services** page displays a list of services that CDO provides. Selecting the **FMC** tab lists the cloud-delivered Firewall Management Center that is linked to the CDO account and all the on-prem management centers onboarded to CDO. The devices that are managed by these on-prem management centers are listed in the **Inventory** page. The **Services** page also lists the secure connectors under the **Secure Connectors** tab.

You can click the **FMC** tab and onboard an on-prem management center by clicking the blue plus icon ( ), and perform device actions using the options in the right pane. You can also see device information such as version, number of devices being managed by the management center, device type, and the synchronization status of the device. Clicking on the managed devices icon takes you to the **Inventory** page, where devices managed by the selected on-prem management center are filtered automatically and displayed. The **Services** page also allows you to select more than one on-prem management center at a time for you to perform actions on a group of management centers all at once. You cannot select any on-prem management center while the cloud-delivered Firewall Management Center is selected. To add a new secure connector or perform actions on existing secure connectors, choose the **Secure Connectors** tab and click .

Navigate **Tools & Services** > **Firewall Management Center**.



For your cloud-delivered Firewall Management Center, the Services page displays the following information:

- If you do not have a cloud-delivered Firewall Management Center deployed on your tenant, click **Enable Cloud-Delivered FMC**. See Enable Cloud-Delivered Firewall Management Center on Your CDO Tenant for more information.
- The number of Secure Firewall Threat Defense devices deployed on the cloud-delivered Firewall Management Center.
- Status of the connection between CDO and the cloud-delivered Firewall Management Center page.
- The last heartbeat of the cloud-delivered Firewall Management Center. This represents the last time the status of the cloud-delivered Firewall Management Center itself and the number of devices that it manages were synchronized with the table on this page.
- The hostname of the selected cloud-delivered Firewall Management Center.

Choose **Cloud-Delivered FMC** and using the links in the **Actions**, **Management**, or **Settings** pane, you open the cloud-delivered Firewall Management Center user interface to perform the configuration tasks that are associated with the link you clicked.

Actions:

- **Check For Changes**: The Device Count and Status information in the table will be updated with the information available the last time this page and the cloud-delivered Firewall Management Center were synchronized. Synchronization happens every 10 minutes.
- **Deployment**: Takes you to the device configuration deployment page on cloud-delivered Firewall Management Center. See Deploy Configuration Changes.
- **Workflows**: Takes you to the **Workflows** page to monitor every process that CDO runs when communicating with devices. See Workflows page.
- **API Explorer**: Takes you to the page that lists the cloud-delivered Firewall Management Center REST APIs. See Secure Firewall Management Center REST API Guide.

Management:

- **Devices**: Takes you to the threat defense device listing page on the cloud-delivered Firewall Management Center portal. See Configure Devices.
- **Policies**: Takes you to the policies page on the cloud-delivered Firewall Management Center portal to edit system-provided access control policies and create custom access control policies. See Manage Access Control Policies.
- **Objects**: Takes you to the policies page on the cloud-delivered Firewall Management Center portal to manage reusable objects. See Object Management.
- **NAT**: Takes you to the policies page on the cloud-delivered Firewall Management Center portal to configure Network Address Translation policies on the threat defense devices. See Manage NAT policies.
- **Site to Site VPN**: Takes you to the site-to-site VPN dashboard page on the cloud-delivered Firewall Management Center portal to configure site-to-site VPN policy between two sites. See Site-to-Site VPNs.
- **Remote Access VPN**: Takes you to the remote access VPN dashboard page on the cloud-delivered Firewall Management Center portal to configure a remote access VPN configuration. See Remote Access VPN.
- **Platform Settings**: Takes you to the platform settings page on the cloud-delivered Firewall Management Center portal configure a range of unrelated features whose values you might want to share among several devices. See Platform Settings.

System:

- **Configuration**: Takes you to the system configuration settings page on the cloud-delivered Firewall Management Center portal to configure system configuration settings. See System Configuration.
- **Smart Licenses**: Takes you to the smart licenses page on the cloud-delivered Firewall Management Center portal to assign licenses to devices. See Assign Licenses to Devices.
- **AMP Management**: Takes you to the AMP management page on the cloud-delivered Firewall Management Center portal that provides intelligence that the system uses to detect and block malware on your network. See Cloud Connections for Malware Protection.
- **Device Health**: Takes you to the health monitoring page on the cloud-delivered Firewall Management Center portal that tracks various health indicators to ensure that the hardware and software in the system are working correctly. See About Health Monitoring.
- **Audit**: Takes you to the audit log page on the cloud-delivered Firewall Management Center portal to show the generated audit record for each user interaction with the web interface.
- **Cisco Cloud Events**: Takes you to the configure Cisco Cloud events page on the CDO portal to configure cloud-delivered Firewall Management Center to send events directly to SAL (SaaS). See Send Events to SAL (SaaS).

After opening the cloud-delivered Firewall Management Center page, click the blue question mark button and select **Page-level Help** to learn more about the page you are on and what further action you can take.

Support to Open CDO and Cloud-delivered Firewall Management Center Applications on Different Tabs

As you configure threat defense devices or objects in the cloud-delivered Firewall Management Center, you can open the appropriate configuration pages in additional browser tabs to work simultaneously in the CDO and the cloud-delivered Firewall Management Center portals without logging off. For example, you can create

an object on the cloud-delivered Firewall Management Center and simultaneously monitor event logs on CDO that are generated from the security policies.

This feature is available for all CDO links that navigate to the cloud-delivered Firewall Management Center portal. To open the cloud-delivered Firewall Management Center portal in a new tab:

On the CDO portal, press and hold the **Ctrl** (Windows) or **Command** (Mac) button, then click the corresponding link.

Note A single click opens the cloud-delivered Firewall Management Center page in the same tab.

Here are some examples of opening the cloud-delivered Firewall Management Center portal page in a new tab:

- Choose **Tools & Services** > **Firewall Management Center** and select **Cloud-Delivered FMC**.

  In the right pane, press and hold the **Ctrl** (Windows) or **Command** (Mac) button, and then click the page that you want to access.

- Choose **Objects** > **Other FTD Objects**.

- Click the search icon in the top-right corner of the CDO page and enter the search strings in the search field that appears.

  From the search result, press and hold the **Ctrl** (Windows) or **Command** (Mac) button, and then click the arrow icon.

- Choose **Dashboard** > **Quick Actions**.

  Press and hold the **Ctrl** (Windows) or **Command** (Mac) button, and then click **Manage FTD Policies** or **Manage FTD Objects**.

Note When you switch to a new CDO tenant, the corresponding cloud-delivered Firewall Management Center portal already opened in a new tab logs out.

Related Topics

- Managing On-Prem Firewall Management Center with Cisco Defense Orchestrator
- Onboard an On-Prem Firewall Management Center
- Request a cloud-delivered Firewall Management Center for your CDO tenant
- Secure Device Connector
- Secure Event Connectors

CDO Device and Service Management

Cisco Defense Orchestrator (CDO) provides the ability to view, manage, filter, and evaluate your onboarded devices on the **Inventory** page. From the **Inventory** page you can:

- Onboard devices and services for CDO management.
- View the configuration state and connectivity state of managed devices and services.
- View onboarded devices and templates categorized in separate tabs. See CDO Inventory Information, on page 89.
- Evaluate and take action on individual devices and services.
- View device and service specific information and resolve issues.
- View device health status for threat defense devices managed by:
  - cloud-delivered Firewall Management Center
  - on-prem management center

  For threat defense devices managed by the cloud-delivered Firewall Management Center, you can also see the node status for devices in a cluster.
- Search for a device or template by name, type, IP address, model name, serial number, or labels. Search is not case-sensitive. Providing multiple search terms brings up devices and services that match at least one of the terms. See Page Level Search, on page 91.
- Filter for a device or template filter by device type, hardware and software versions, snort version, configuration status, connection states, conflict detection, and secure device connectors, and labels. See Filters.

Changing a Device's IP Address in CDO

When you onboard an device to Cisco Defense Orchestrator (CDO) using an IP address, CDO stores that IP address in its database and communicates with the device using that IP address. If the IP address of the device changes, you can update the IP address stored in CDO to match the new address. Changing the device's IP address on CDO does not change device's configuration.

To change the IP address, CDO uses to communicate with a device, follow this procedure:

Procedure

Step 1 In the navigation bar, click **Inventory**.

Step 2 Click the **Devices** tab to locate the device.

Step 3 Click the appropriate device type tab.

You can use the Filters and Page Level Search functionalities to find the required device.

Step 4 Select the device whose IP address it is you want to change.

Step 5 Above the **Device Details** pane, click the edit button next to the device's IP address.

Step 6 Enter the new IP address in the field and click the blue check button.

No change is made to the device itself, so the device's Configuration Status will continue to show that it is Synced.

Related Information:

- Moving Devices Between Tenants, on page 88
- Bulk Reconnect Devices to CDO, on page 87

Changing a Device's Name in CDO

All devices, models, templates, and services are given a name when they are onboarded or created in CDO. You can change that name without changing the configuration of the device itself.

Procedure

Step 1 From the navigation bar, click **Inventory**.

Step 2 Click the **Device** tab to locate the device.

Step 3 Select the device whose name it is you want to change.

Step 4 Above the **Device Details** pane, click the edit button next to the device's name.

Step 5 Enter the new name in the field and click the blue check button.

No change is made to the device itself, so the device's Configuration Status will continue to show that it is Synced.

Export a List of Devices and Services

This article explains how to export your list of devices and services to a comma-separated value (.csv) file. Once in that format, you can open the file in a spreadsheet application such as Microsoft Excel to sort and filter the items in your list.

The export button is available in the devices and the templates tab. You are also allowed to export details from devices under the selected device type tab.

Before you export your list of devices and services, look at the filter pane and determine if the Inventory table is displaying the information you want to export. Clear all your filters to see all of your managed devices and services, or filter the information to display a subset of all your devices and services. The export function exports what you can see in the Inventory table.

Procedure

Step 1 In the CDO navigation bar, click **Inventory**.

Step 2 Click the **Devices** tab to locate the device or the **Templates** tab to locate the model device.

Step 3 Click the appropriate device type tab to export details from devices under that tab or click **All** to export details from all devices.

You can use the Filters and Page Level Search functionalities to find the required device.

Step 4 Click **Export list to CSV**:

Step 5 If prompted, save the .csv file.

Step 6 Open the .csv file in a spreadsheet application to sort and filter the results.

Export Device Configuration

You can only export one device configuration at a time. Use the following procedure to export a device's configuration to a JSON file:

Procedure

Step 1 In the navigation bar, click **Inventory**.

Step 2 Click the **Devices** tab to locate the device or the **Templates** tab to locate the model device.

Step 3 Click the appropriate device type tab.

You can use the Filters and Page Level Search functionalities to find the required device.

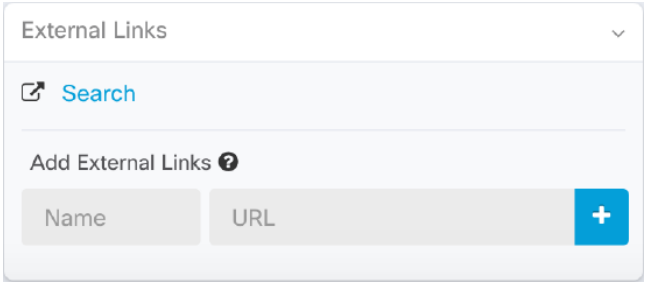
Step 4 Select the device you want so it is highlighted.

Step 5 In the **Actions** pane, select **Export Configuration**.

Step 6 Select **Confirm** to save the configuration as a JSON file.

External Links for Devices

You can create a hyperlink to an external resource and associate it with a device you manage with CDO. You could use this feature to create a convenient link to the local manager of one of your devices (Firepower Device Manager (FDM) for an FTD). You could also use it to link to a search engine, documentation resource, a corporate wiki, or any other URL that you choose. You can associate as many external links with a device as you want. You can also associate the same link with multiple devices at the same time.



The links you create can reach anywhere, but your company's security requirements do not change. For example, if you ordinarily need to be connected to your corporate network, by being on-premises or through a VPN connection to reach a particular URL, those requirements remain. If your company blocks specific URLs, those URLs continue to be blocked. URLs that are not restricted continue to not be restricted.

Location Variable

We have created the {location} variable that you can incorporate in your URLs. This variable will be populated with the IP address of your device. For example,

```
https://{location}
```

or the FDM of your FDM-managed device.

Related Information:

- Write a Device Note, on page 88
- Export a List of Devices and Services, on page 83

Create an External Link from your Device

Procedure

Step 1 In the navigation bar, click **Inventory**.

Step 2 Click the **Devices** tab to locate the device or the **Templates** tab to locate the model device.

Step 3 Click the appropriate device type tab.

Step 4 Select a device or model.

You can use the Filters and Page Level Search functionalities to find the required device.

Step 5 In the details pane, on the right, go to the **External Links** section.

Step 6 Enter a name for the link.

Step 7 Enter the URL for the link in the URL field. You need to specify the full URL, for example, for Cisco enter http://www.cisco.com.

Step 8 Click + to associate the link with the device.

Create an External Link to FDM

Here is a convenient way to open the Firepower Device Manager (FDM) of your FDM-managed device, directly from CDO.

Procedure

Step 1 In the navigation bar, click **Inventory**.

Step 2 Click the **Devices** tab to locate the device or the **Templates** tab to locate the model device.

Step 3 Click the appropriate device type tab.

You can use the Filters and Page Level Search functionalities to find the required device.

Step 4 Select a device or model.

Step 5 In the details pane, on the right, go to the **External Links** section.

Step 6 Enter a name for the link such as FDM.

Step 7 Enter https://{location} in the URL field. The {location} variable will be populated with the IP address of your device.

Step 8 Click the + box.

Create an External Link for Multiple Devices

Procedure

Step 1 In the navigation bar, click **Inventory**.

Step 2 Click the **Devices** tab to locate the device or the **Templates** tab to locate the model device.

Step 3 Click the appropriate device type tab.

You can use the Filters and Page Level Search functionalities to find the required devices.

Step 4 Select multiple devices or models.

Step 5 In the details pane, on the right, go to the **External Links** section.

Step 6 Enter a name for the link.

Step 7 Enter the URL you want to reach using one of these methods:

- Enter

  ```
  https://{location}
  ```

  in the URL field. The {location} variable will be populated with the IP address of your device. This creates an automatic link to the ASDM for your device.

- Enter the URL for the link in the URL field. You need to specify the full URL, for example, for Cisco enter http://www.cisco.com.

Step 8 Click + to associate the link with the device.

Edit or Delete External Links

Procedure

Step 1 In the navigation bar, click **Inventory**.

Step 2 Click the **Devices** tab to locate the device or the **Templates** tab to locate the model device.

Step 3 Click the appropriate device type tab.

You can use the Filters and Page Level Search functionalities to find the required device.

Step 4 Select a device or model.

Step 5 In the details pane, on the right, go to the **External Links** section.

Step 6 Mouse-over the name of the link to reveal the edit and delete icons.

Step 7 Click the appropriate icon to edit or delete the external link and confirm your action.

Edit or Delete External Links for Multiple Devices

Procedure

Step 1 In the navigation bar, click **Inventory**.

Step 2 Click the **Devices** tab to locate the device or the **Templates** tab to locate the model device.

Step 3 Click the appropriate device type tab.

You can use the Filters and Page Level Search functionalities to find the required devices.

Step 4 Select multiple devices or models.

Step 5 In the details pane, on the right, go to the **External Links** section.

Step 6 Mouse-over the name of the link to reveal the edit and delete icons.

Step 7 Click the appropriate icon to edit or delete the external link and confirm your action.

Bulk Reconnect Devices to CDO

CDO allows an administrator to attempt to reconnect more than one managed device to CDO at the same time. When a device CDO manages is marked "unreachable," CDO can no longer detect out of band configuration changes or manage the device. There could be many different reasons for the disconnect. Attempting to reconnect the devices is a simple first step in restoring CDO's management of the device.

Note If you are reconnecting devices having new certificates, CDO automatically reviews and accepts the new certificates on the devices and continues to reconnect with them. However, if you are reconnecting with only one device, CDO prompts you to review and accept the certificate manually to continue to reconnect with it.

Procedure

Step 1 In the navigation bar, click **Inventory**.

Step 2 Click the **Devices** tab to locate devices.

Step 3 Click the appropriate device type tab.

Use the Filters to look for devices whose connectivity status is "unreachable."

Step 4 From the filtered results, select the devices you want to attempt to reconnect.

Step 5 Click **Reconnect** . Notice that CDO only provides command buttons for actions that can be applied to all the selected devices.

Step 6 Look at the **notifications** tab for the progress of the bulk device reconnect action. If you want more information about how the actions in the bulk device reconnect job succeeded or failed, click the blue Review link and you will be directed to the Jobs Page.

Tip If a reconnect failure was caused because the device's certificate or credentials have changed, you will have to reconnect to those devices individually to add the new credentials and accept the new certificate.

Moving Devices Between Tenants

Once you have onboarded devices to a CDO tenant, you cannot migrate the devices from one CDO tenant to another. If you want to move your devices to a new tenant, you need to remove the devices from the old tenant and re-onboard them to the new tenant.

Write a Device Note

Use this procedure to create a single, plain-text, note file for a device.

Procedure

Step 1 In the navigation bar, click **Inventory**.

Step 2 Click the **Devices** tab to locate the device or the **Templates** tab to locate the model device.

Step 3 Click the appropriate device type tab.

Step 4 Select the device or model you want to create a note for.

Step 5 In the **Management** pane on the right, click **Notes**. Notes.

Step 6 Click the editor button on the right and select the Default text editor, Vim, or Emacs text editors.

Step 7 Edit the Notes page.

Step 8 Click **Save**.
The note is saved in the tab.

CDO Inventory Information

The **Inventory** page shows all physical and virtual onboarded devices and templates created from the onboarded devices. The page classifies devices and templates based on their type and displays them in the corresponding tabs dedicated to each device type. You can use Page Level Search functionality or apply a Filters to find devices within the selected device type tab.

You can view the following details on this page:

- The **Devices** tab shows all the live devices that are onboarded to CDO.
- The **Templates** shows all the template devices created from live devices or configuration files imported to CDO.

CDO Labels and Filtering

Labels are used for grouping devices or objects. You can apply labels to one or more devices during onboarding or at any time after onboarding. You can apply labels to objects after you create them. Once you have applied labels to devices or objects, you can filter the contents of the device table or objects table by that label.

Note A label applied to a device is not extended to its associated objects, and a label applied to a shared object is not extended to its associated objects.

You can create a label group by using the following syntax “group name:label”. For example, Region:East or Region:West. If you were to create these two labels, the group label would be Region and you could choose from East or West in that group.

Applying Labels to Devices and Objects

To apply a label to devices, perform the following steps:

Procedure

Step 1 To add a label to a device, click **Inventory** in the navigation pane on the left. To add a label to an object, click **Objects** in the navigation pane on the left.

Step 2 Click the **Devices** tab to locate the device or the **Templates** tab to locate the model device.

Step 3 Click the appropriate device type tab.

Step 4 Select one or more devices or model in the generated table.

Step 5 In the **Add Groups and Labels** field on the right, specify a label for the device.

Step 6 Click blue + icon.

Filters

You can use many different filters on the **Inventory** and **Objects** pages to find the devices and objects you are looking for.

To filter, click in the left-hand pane of the Inventory, Policies, and Objects tabs:

The Inventory filter allows you to filter by device type, hardware and software versions, snort version, configuration status, connection states, conflict detection, and secure device connectors, and labels. You can apply filters to find devices within a selected device type tab. You can use filters to find devices within the selected device type tab.

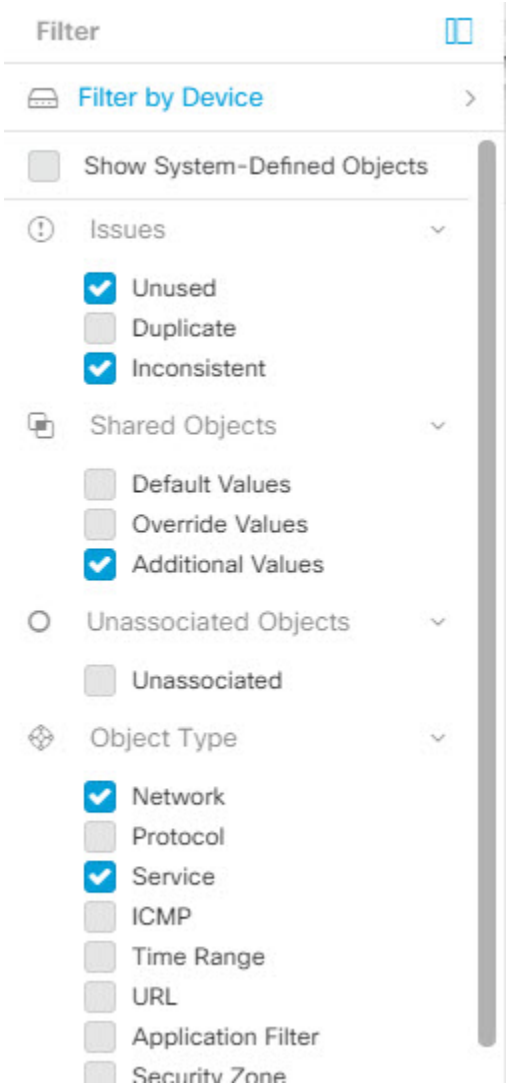
Note When the **FTD** tab is opened, the filter pane provides filters to show FDM-managed devices based on the management application through which the devices are accessed from CDO.

- FDM: Devices managed using FTD API or FDM.
- FMC-FTD: Devices managed using Firepower Management Center.
- FTD: Devices managed using FTD Management.

The object filter allows you to filter by device, issue type, shared objects, unassociated objects, and object type. You can include system objects in your results or not. You can also use the search field to search for objects in the filter results that contain a certain name, IP address, or port number.

When filtering devices and objects, you can combine your search terms to create several potential search strategies to find relevant results.

In the following example, filters are applied to search objects that are "Issues (Used OR Inconsistent) AND Shared Objects with Additional Values AND Objects of type Network OR Service.



Use CDO Search Functionality

The CDO platform has a highly efficient search function that makes it easy to find anything you need. The search bar on each page is tailored to the content of that page, while the global search allows for a comprehensive search across the entire tenant. This saves time and effort, as you can quickly locate the necessary information.

Page Level Search

The page-level search enables you to search specific items on the Inventory, Policies, Objects, VPN, Change Log, and Jobs pages.

- In the **Inventory** space, you can simply start typing in the search bar, and devices that fit the search criteria will be displayed. You can type any partial part name of the device, IP address, or the serial number of the physical device to find the device.

- In the **Policies** space, you can search policies by their name, components or objects used in them.
- In the **Objects** space, you can search for an object by typing any partial part of the name of the object, or partial IP Address, port, or protocols.
- In the **VPN** space, you can search by tunnel name, device name, and IP address used in the VPN policies.
- In the **Change log** space, you can search logs based on events, device names, or actions.

Procedure

Step 1 Navigate to the search bar near the top of the interface.

Step 2 Type the search criteria into the Search Bar and the corresponding results will be displayed.

Global Search

The global search feature allows you to quickly locate and navigate to devices managed by CDO.

All search results are based on the indexing option you choose. The indexing options are as follows:

- Full Indexing—Requires that you invoke the full indexing process. This process scans all the devices and objects in the system and displays them in the search index only after you invoke the indexing. To invoke full indexing, you must have administrative privileges.

  For more information, see Initiate Full Indexing, on page 93.

- Incremental Indexing—An event-based indexing process where the search index automatically updates each time that a device or an object is added, modified, or deleted.

The information that you enter in the search field is not case-sensitive. You can perform a global search using the following entities:

- Device Name—Supports partial device names, URL, IP address or range.
- Object Types—Supports object name, object descriptions, and configured values.
- Policy Types—Supports policy name, policy description, rule name, and rule comments.

  Cloud-delivered Firewall Management Center and On-Prem FMC managed in CDO support the following policy types:

  - Access Control Policy
  - Prefilter Policy
  - Threat Defense NAT Policy

When you type a search expression, the interface begins to display search results and you do not need to press *Enter* to execute a search.

The search results display all devices and objects that match your search strings. If your search string matches more than device or object, the results appear under categories (devices, objects, and connected_fmc).

By default, the first item in the search result is highlighted and the related information for that item appears in the right pane. You can scroll through the search results and click any item to view the corresponding information. You can click the arrow icon besides the item to navigate to the corresponding page.

Note

- Global search does not display duplicate search results. For objects, the UID of the shared object is used to navigate to the Object view.
- If you delete a device from CDO, all associated objects are removed from the global search index.
- If you delete an object from the policy and retain the device before you initiate full indexing, the object remains in the global search index because it is associated with the device.

Initiate Full Indexing

Procedure

Step 1 Log into CDO using an account with Admin or Super Admin privileges.

Step 2 From the menu bar, navigate to **Settings** > **General Settings**.

Step 3 In Global Search, click **Initiate Full Indexing** to trigger indexing.

Note Initiating full indexing clears existing indexing of the CDO tenant.

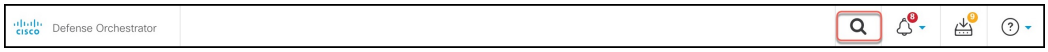
Step 4 Click **here** to view the global search workflow.

Perform a Global Search

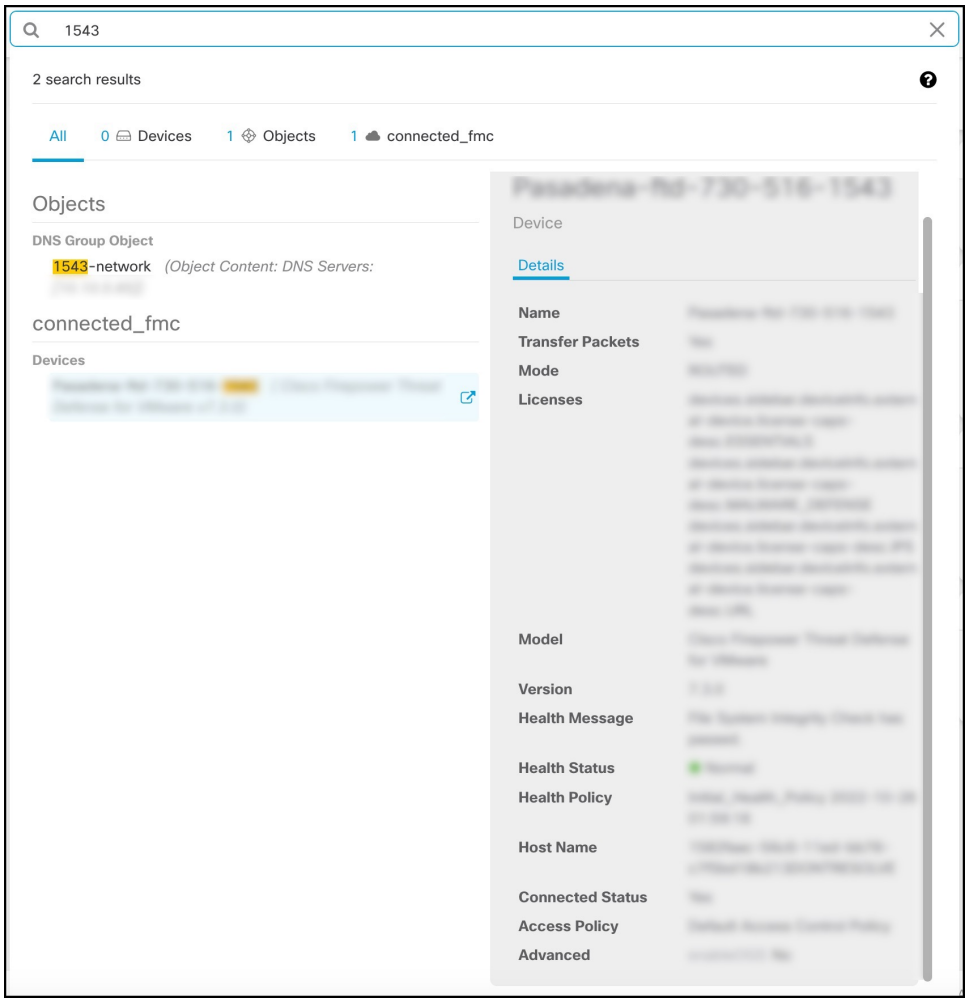
Procedure

Step 1 Log into CDO.

Step 2 Click the search icon in the top-right corner of the CDO page and enter the search strings in the search field that appears.



The search results display a list of possible items as you begin entering the search strings. The search results appear under four categories: All, Devices, Objects, and connected_fmc. The right pane displays information for a selected search result.



Step 3 From the search result, select a device or an object, and click the arrow icon to navigate from the search results to the corresponding device and object page. From the search result, select an item, and click the arrow icon to navigate from the search results to the corresponding page.

Note Selecting a search result for devices in the cloud-delivered Firewall Management Center, allows you to navigate to the cloud-delivered Firewall Management Center user interface within CDO.

For information on cloud-delivered Firewall Management Center, see Managing Firewall Threat Defense with Cloud-Delivered Firewall Management Center in Cisco Defense Orchestrator.

Step 4 Click **X** to close the search bar.

Objects

An object is a container of information that you can use in one or more security policies. Objects make it easy to maintain policy consistency. You can create a single object, use it different policies, modify the object, and

that change is propagated to every policy that uses the object. Without objects, you would need to modify all the policies, individually, that require the same change.

When you onboard a device, CDO recognizes all the objects used by that device, saves them, and lists them on the **Objects** page. From the **Objects** page, you can edit existing objects and create new ones to use in your security policies.

CDO calls an object used on multiple devices a **shared object** and identifies them in the **Objects** page with this badge .

Sometimes a shared object develops some "issue" and is no longer perfectly shared across multiple policies or devices:

- **Duplicate objects** are two or more objects on the same device with different names but the same values. These objects usually serve similar purposes and are used by different policies. Duplicate objects are identified by this issue icon:
- **Inconsistent objects** are objects on two or more devices with the same name but different values. Sometimes users create objects in different configurations with same name and content but over time the values of these objects diverge which creates the inconsistency. Inconsistent objects are identified by this issue icon:
- **Unused objects** are objects that exist in a device configuration but are not referenced by another object, an access-list, or a NAT rule. Unused objects are identified by this issue icon:

You can also create objects for immediate use in rules or policies. You can create an object that is unassociated with any rule or policy.

You can view the objects managed by CDO by navigating to the **Objects** menu or by viewing them in the details of a network policy.

CDO allows you to manage network and service objects across supported devices from one location. With CDO, you can manage objects in these ways:

- Search for and Object Filters based on a variety of criteria.
- Find duplicate, unused, and inconsistent objects on your devices and consolidate, delete, or resolve those object issues.
- Find unassociated objects and delete them if they are unused.
- Discover shared objects that are common across devices.
- Evaluate the impact of changes to an object on a set of policies and devices before committing the change.
- Compare a set of objects and their relationships with different policies and devices.
- Capture objects in use by a device after it has been on-boarded to CDO.

If you have issues with creating, editing, or reading objects from an onboarded device, see Troubleshoot Cisco Defense Orchestrator for more information.

Object Types

The following table describes the objects that you can create for your devices and manage using CDO.

Table 3: FDM-Managed Device Object Types

Object	Description
Application Filter Objects	An application filter object defines the applications used in an IP connection, or a filter that defines applications by type, category, tag, risk, or business relevance. You can use these objects in policies to control traffic instead of using port specifications.
AnyConnect Client Profile	AnyConnect Client Profile objects are file objects and represent files used in configurations, typically for remote access VPN policies. They can contain an AnyConnect Client Profile and AnyConnect Client Image files.
Certificate Objects	Digital certificates provide digital identification for authentication. Certificates are used for SSL (Secure Socket Layer), TLS (Transport Layer Security), and DTLS (Datagram TLS) connections, such as HTTPS and LDAPS.
DNS Group Objects	DNS servers are needed to resolve fully-qualified domain names (FQDN), such as www.example.com, to IP addresses. You can configure different DNS group objects for management and data interfaces.
Create and Edit a Firepower Geolocation Filter Object	A geolocation object defines countries and continents that host the device that is the source or destination of traffic. You can use these objects in policies to control traffic instead of using IP addresses.
Create or Edit an IKEv1 Policy	An IKEv1 policy object contain the parameters required for IKEv1 policies when defining VPN connections.
IKEv2 Policy	An IKEv2 policy objects contain the parameters required for IKEv2 policies when defining VPN connections.
IKEv1 IPSEC Proposal	IPsec Proposal objects configure the IPsec proposal used during IKE Phase 1 negotiations. The IPsec proposal defines the combination of security protocols and algorithms that secure traffic in an IPsec tunnel.
IKEv2 IPSEC Proposal	IPsec Proposal objects configure the IPsec proposal used during IKE Phase 2 negotiations. The IPsec proposal defines the combination of security protocols and algorithms that secure traffic in an IPsec tunnel.
Network Objects	Network groups and network objects (collectively referred to as network objects) define the addresses of hosts or networks.

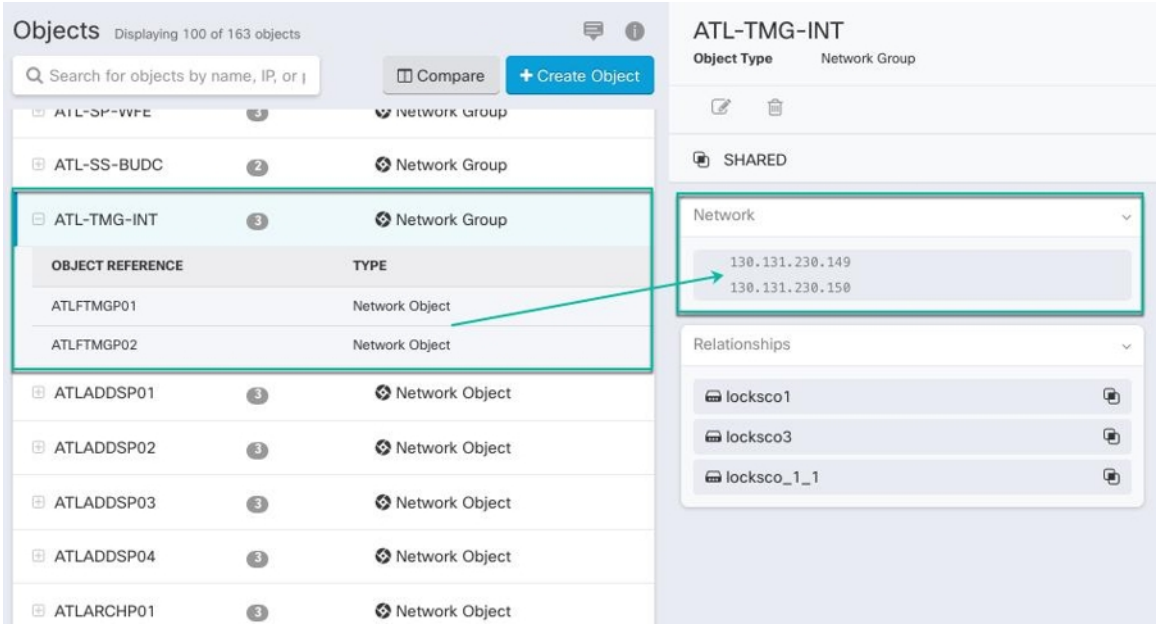
Object	Description
Security Zone Object	A security zone is a grouping of interfaces. Zones divide the network into segments to help you manage and classify traffic.
Service Objects	Service objects, service groups, and port groups are reusable components that contain protocols or ports considered part of the TCP/IP protocol suite.
Create an SGT Group	A SGT dynamic object identifies source or destination addresses based on an SGT assigned by ISE and can then be matched against incoming traffic.
Syslog Server Objects	A syslog server object identifies a server that can receive connection-oriented or diagnostic system log (syslog) messages.
URL Objects	Use URL objects and groups (collectively referred to as URL objects) to define the URL or IP addresses of web requests. You can use these objects to implement manual URL filtering in access control policies or blocking in Security Intelligence policies.

Shared Objects

Cisco Defense Orchestrator (CDO) calls objects on multiple devices with the same name and same contents, **shared objects**. Shared objects are identified by this icon

on the **Objects** page. Shared objects make it easy to maintain policies because you can modify an object in one place and that change affects all the other policies that use that object. Without shared objects, you would need to modify all the policies individually that require the same change.

When looking at a shared object, CDO shows you the contents of the object in the object table. Shared objects have exactly the same contents. CDO shows you a combined or "flattened" view of the elements of the object in the details pane. Notice that in the details pane, the network elements are flattened into a simple list and not directly associated with a named object.

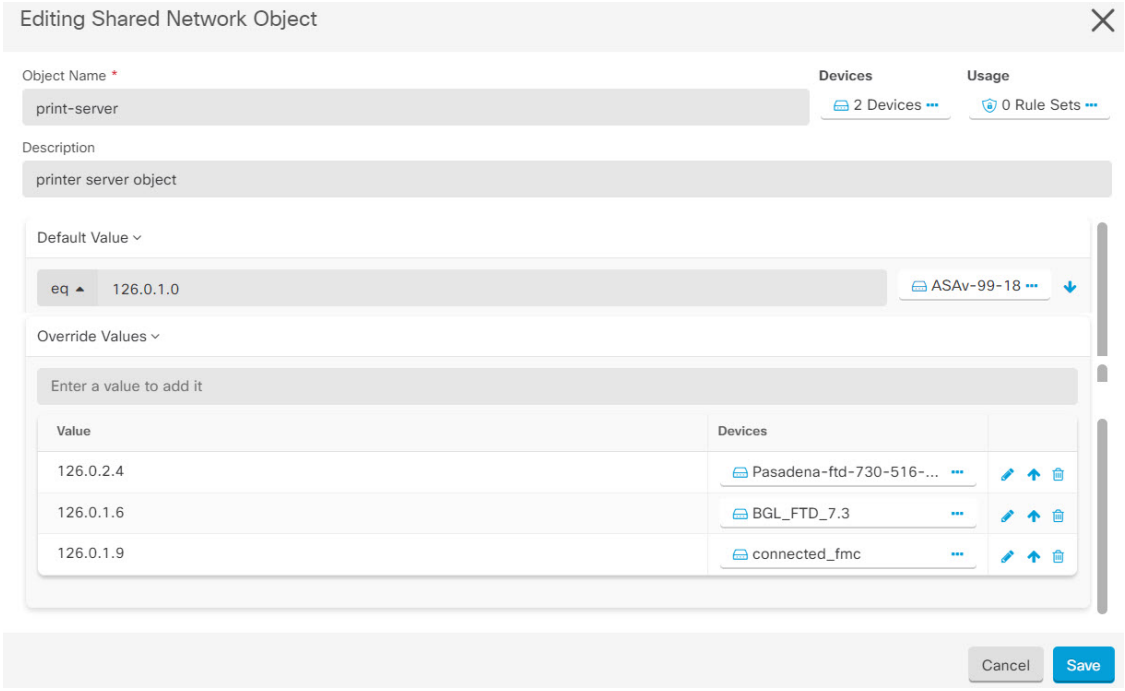


Object Overrides

An object override allows you to override the value of a shared network object on specific devices. CDO uses the corresponding value for the devices that you specify when configuring the override. Although the objects are on two or more devices with the same name but different values, CDO doesn't identify them as **Inconsistent objects** only because these values are added as overrides.

You can create an object whose definition works for most devices, and then use overrides to specify modifications to the object for the few devices that need different definitions. You can also create an object that needs to be overridden for all devices, but its use allows you to create a single policy for all devices. Object overrides allow you to create a smaller set of shared policies for use across devices without giving up the ability to alter policies when needed for individual devices.

For example, consider a scenario where you have a printer server in each of your offices, and you have created a printer server object `print-server`. You have a rule in your ACL to deny printer servers from accessing the internet. The printer server object has a default value that you want to change from one office to another. You can do this by using object overrides and maintain rule and "printer-server" object consistent across all locations, although their values may be different.



Note CDO allows you to override objects associated with the rules in a ruleset. When you add a new object to a rule, you can override it only after you attach a device to the ruleset and save the changes. See Configure Rulesets for an FTD for more information.

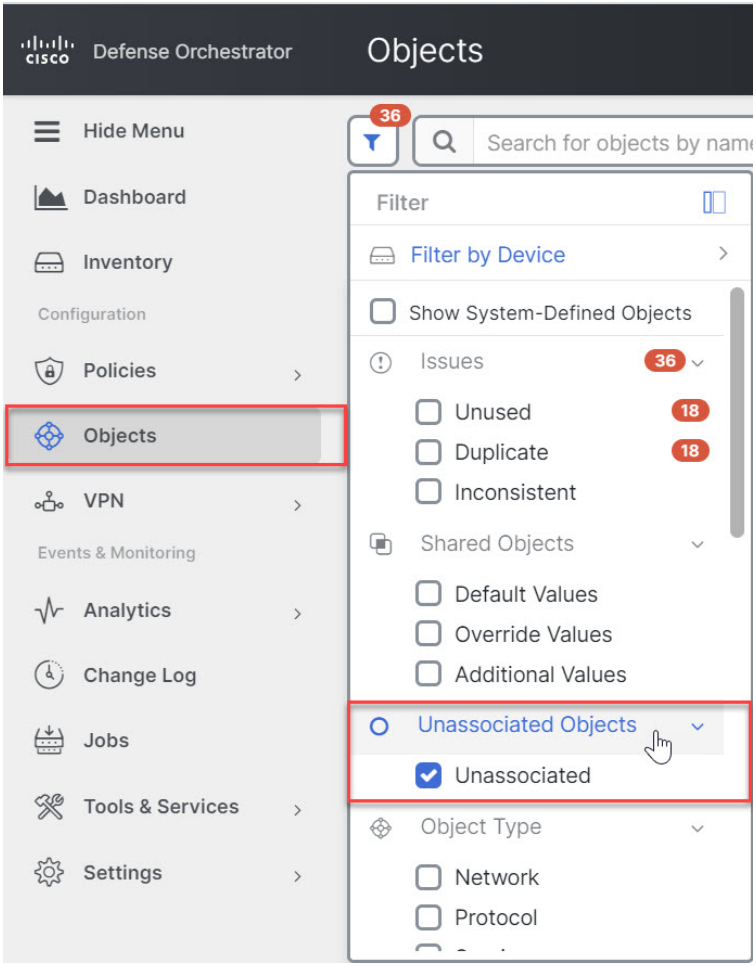
Note If there are inconsistent objects, you can combine them into a single shared object with overrides. See Resolve Inconsistent Object Issues for more information.

Unassociated Objects

You can create objects for immediate use in rules or policies. You can also create an object that is unassociated with any rule or policy. When you use that unassociated object in a rule or policy, CDO creates a copy of it and uses the copy. The original unassociated object remains among the list of available objects until it is either deleted by a nightly maintenance job, or you delete it.

Unassociated objects remain in CDO as a copy to ensure that not all configurations are lost if the rule or policy associated with the object is deleted accidentally.

To view unassociated objects click in the left-hand pane of the Objects tab and check the **Unassociated** checkbox.

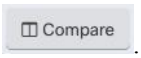


Compare Objects

Procedure

Step 1 In the CDO navigation bar on the left, click **Objects** and choose an option.

Step 2 Filter the objects on the page to find the objects you want to compare.

Step 3 Click the **Compare** button 

.

Step 4 Select up to three objects to compare.

Step 5 View the objects, side-by-side, at the bottom of the screen.

- Click the up and down arrows in the Object Details title bar to see more or less of the Object Details.
- Expand or collapse the Details and Relationships boxes to see more or less information.

Step 6 (Optional) The Relationships box shows how an object is used. It may be associated with a device or a policy. If the object is associated with a device, you can click the device name and then click **View Configuration**

to see the configuration of the device. CDO shows you the device's configuration file and highlights the entry for that object.

Filters

You can use many different filters on the **Inventory** and **Objects** pages to find the devices and objects you are looking for.

To filter, click in the left-hand pane of the Inventory, Policies, and Objects tabs:

The Inventory filter allows you to filter by device type, hardware and software versions, snort version, configuration status, connection states, conflict detection, and secure device connectors, and labels. You can apply filters to find devices within a selected device type tab. You can use filters to find devices within the selected device type tab.

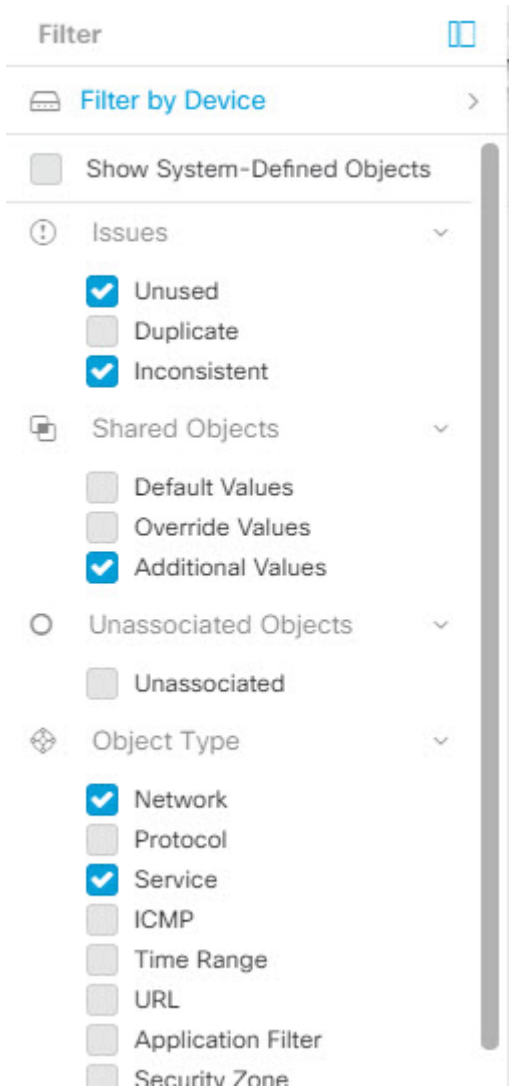
Note When the **FTD** tab is opened, the filter pane provides filters to show FDM-managed devices based on the management application through which the devices are accessed from CDO.

- FDM: Devices managed using FTD API or FDM.
- FMC-FTD: Devices managed using Firepower Management Center.
- FTD: Devices managed using FTD Management.

The object filter allows you to filter by device, issue type, shared objects, unassociated objects, and object type. You can include system objects in your results or not. You can also use the search field to search for objects in the filter results that contain a certain name, IP address, or port number.

When filtering devices and objects, you can combine your search terms to create several potential search strategies to find relevant results.

In the following example, filters are applied to search objects that are "Issues (Used OR Inconsistent) AND Shared Objects with Additional Values AND Objects of type Network OR Service.



Object Filters

To filter, click in the left-hand pane of the Objects tab:

- **All Objects** – This filter provides you all the objects available from all the devices you have on-boarded in CDO. This filter is useful to browse all your objects, or as a starting point to search or further apply sub-filters.
- **Shared Objects** – This quick filter shows you all the Objects that CDO has found to be shared on more than one device.
- **Objects By Device** – Lets you pick a specific device so that you can see objects found on the selected device.

Sub filters – Within each main filter, there are sub-filters you can apply to further narrow down your selection. These sub-filters are based on Object Type – Network, Service, Protocol, etc.

The selected filters in this filter bar would return objects that match the following criteria:

***** Objects that are on one of two devices. (Click **Filter by Device** to specify the devices.) AND are

*** Inconsistent** objects AND are

*** Network** objects OR **Service** objects AND

***** Have the word "**group**" in their object naming convention

Because **Show System Objects** is checked, the result would include both system objects and user-defined objects.

Show System Objects Filter

Some devices come with pre-defined objects for common services. These system objects are convenient because they are already made for you and you can use them in your rules and policies. There can be many system objects in the objects table. System objects cannot be edited or deleted.

Show System Objects is **off** by default. To display system objects in the object table, check **Show System Objects** in the filter bar. To hide system objects in the object table, leave Show System Objects unchecked in the filter bar.

If you hide system objects, they will not be included in your search and filtering results. If you show system objects, they will be included in your object search and filtering results.

Configure Object Filters

You can filter on as few or as many criteria as you want. The more categories you filter by, the fewer results you should expect.

Procedure

Step 1 In the CDO navigation bar on the left, click **Objects** and choose an option.

Step 2 Open the filter panel by clicking the filter icon at the top of the page. Uncheck any filters that have been checked to make sure no objects are inadvertently filtered out. Additionally, look at the search field and delete any text that may have been entered in the search field.

Step 3 If you want to restrict your results to those found on particular devices:

a. Click **Filter By Device**.

b. Search all the devices or click a device tab to search for only devices of a certain kind.

c. Check the device you want to include in your filter criteria.

d. Click **OK**.

Step 4 Check **Show System Objects** to include system objects in your search results. Uncheck **Show System Objects** to exclude system objects from your search results.

Step 5 Check the object **Issues** you want to filter by. If you check more than one issue, objects in any of the categories you check are included in your filter results.

Step 6 Check **Ignored** issues if you want to see the object that had issues but was ignored by the administrator.

Step 7 Check the required filter in **Shared Objects** if you are filtering for objects shared between two or more devices.

- **Default Values**: Filters objects having only the default values.

- **Override Values**: Filters objects having overridden values.
- **Additional Values**: Filters objects having additional values.

Step 8 Check **Unassociated** if you are filtering for objects that are not part of any rule or policy.

Step 9 Check the **Object Types** you want to filter by.

Step 10 You can also add an object name, IP address, or port number to the Objects search field to find objects with your search criteria among the filtered results.

When to Exclude a Device from Filter Criteria

When adding a device to filtering criteria, the results show you the objects on a device but not the relationships of those objects to other devices. For example, assume **ObjectA** is shared between ASA1 and ASA2. If you were to filter objects to find shared objects on ASA1, you would find **ObjectA** but the **Relationships** pane would only show you that the object is on ASA1.

To see all the devices to which an object is related, don't specify a device in your search criteria. Filter by the other criteria and add search criteria if you choose to. Select an object that CDO identifies and then look in the Relationships pane. You will see all the devices and policies the object is related to.

Unignore Objects

One way to resolve unused, duplicate, or inconsistent objects is to ignore them. You may decide that though an object is unused, a duplicate, or inconsistent, there are valid reasons for that state and you choose to leave the object issue unresolved. At some point in the future, you may want to resolve those ignored objects. As CDO does not display ignored objects when you search for object issues, you will need to filter the object list for ignored objects and then act on the results.

Procedure

Step 1 In the CDO navigation bar on the left, click **Objects** and choose an option.

Step 2 Object Filters.

Step 3 In the **Object** table, select the object you want to unignore. You can unignore one object at a time.

Step 4 Click **Unignore** in the details pane.

Step 5 Confirm your request. Now, when you filter your objects by issue, you should find the object that was previously ignored.

Deleting Objects

You can delete a single object or mulitple objects.

Delete a Single Object

Caution If cloud-delivered Firewall Management Center is deployed on your tenant:

Changes you make to network objects and groups on the or **Objects > FDM Objects** page are reflected in the corresponding cloud-delivered Firewall Management Center network object or group on the **Objects > Other FTD Objects** page. In addition, an entry is created in the **Devices with Pending Changes** page for each on-prem management center with **Discover & Manage Network Objects** enabled, from which you can choose and deploy the changes to the on-prem management center on which you have these objects.

Deleting a network object or group from either page deletes the object or group from both pages.

Procedure

Step 1 In the CDO navigation bar on the left, choose **Objects** and choose an option.

Step 2 Locate the object you want to delete by using object filters and the search field, and select it.

Step 3 Review the **Relationships** pane. If the object is used in a policy or in an object group, you cannot delete the object until you remove it from that policy or group.

Step 4 In the Actions pane, click the **Remove** icon .

Step 5 Confirm that you want to delete the object by clicking **OK**.

Step 6 Review and deploy the changes you made, or wait and deploy multiple changes at once.

Delete a Group of Unused Objects

As you onboard devices and start resolving object issues, you find many unused objects. You can delete up to 50 unused objects at a time.

Procedure

Step 1 Use the **Issues** filter to find **unused** objects. You can also use the Device filter to find objects that are not associated with a device by selecting **No Device**. Once you have filtered the object list, the object checkboxes appear.

Step 2 Check the **Select all** checkbox in the object table header to select all the objects found by the filter that appear in the object table; or, check individual checkboxes for individual objects you want to delete.

Step 3 In the Actions pane, click the **Remove** icon .

Step 4 Review and deploy now the changes you made, or wait and deploy multiple changes at once.

Network Objects

A network object can contain a host name, a network IP address, a range of IP addresses, a fully qualified domain name (FQDN), or a subnetwork expressed in CIDR notation. **Network groups** are collections of network objects and other individual addresses or subnetworks you add to the group. Network objects and

network groups are used in access rules, network policies, and NAT rules. You can create, update, and delete network objects and network groups using CDO.

Table 4: Pemitted Values of Network Objects

Device type	IPv4 / IPv6	Single Address	Range of addresses	Fully Qualified Domain Name	Subnet using CIDR Notation
FTD	IPv4 and IPv6	Yes	Yes	Yes	Yes

Table 5: Pemitted Contents of a Network Group

Device type	IP Value	Network Object	Network Groups
FTD	No	Yes	Yes

Reusing Network Objects Across Products

If you have a Cisco Defense Orchestrator tenant with a cloud-delivered Firewall Management Center and one or more on-prem management centers onboarded to your tenant:

- When you create a Secure Firewall Threat Defense, FDM-managed threat defense, ASA, or Meraki network object or group, a copy of the object is also added to the objects list on the **Objects > Other FTD Objects** page used when configuring cloud-delivered Firewall Management Center, and vice versa.
- When you create a Secure Firewall Threat Defense, FDM-managed threat defense, or ASA network object or group, an entry is created in the **Devices with Pending Changes** page for each On-Prem Firewall Management Center for which **Discover & Manage Network Objects** is enabled. From this list, you can choose and deploy the object to the on-prem management center on which you want to use the object and discard the ones that you do not want. Navigate **Tools & Services** > **Firewall Management Center**, select the on-prem management center, and click **Objects** to see your objects in the On-Prem Firewall Management Center user interface and assign them to policies.

Changes you make to network objects or groups on either page apply to the object or group instance on both pages. Deleting an object from one page also deletes the corresponding copy of the object from the other page.

Exceptions:

- If a network object of the same name already exists for cloud-delivered Firewall Management Center, the new Secure Firewall Threat Defense, FDM-managed threat defense, ASA, or Meraki network object will not be replicated on the **Objects > Other FTD Objects** page of Cisco Defense Orchestrator
- Network objects and groups in onboarded threat defense devices that are managed by on-premises Secure Firewall Management Center are not replicated on the **Objects > Other FTD Objects** page and cannot be used in cloud-delivered Firewall Management Center.

  Note that for on-premises Secure Firewall Management Center instances that have been *migrated* to cloud-delivered Firewall Management Center, network objects and groups *are* replicated to the CDO objects page if they are used in policies that were deployed to FTD devices.
- Sharing Network Objects between CDO and cloud-delivered Firewall Management Center is automatically enabled on new tenants but must be requested for existing tenants. If your network objects are not being shared with cloud-delivered Firewall Management Center, contact TAC to have the features enabled on your tenant.

- Sharing network objects between CDO and On-Prem Management Center is not automatically enabled on CDO for new on-prem management centers onboarded to CDO. If your network objects are not being shared with On-Prem Management Center, ensure **Discover & Manage Network Objects** toggle button is enabled for the on-prem management center in **Settings** or contact TAC to have the features enabled on your tenant.

Viewing Network Objects

Network objects you create using CDO and those CDO recognizes in an onboarded device's configuration are displayed on the Objects page. They are labeled with their object type. This allows you to filter by object type to quickly find the object you are looking for.

When you select a network object on the Objects page, you see the object's values in the Details pane. The Relationships pane shows you if the object is used in a policy and on what device the object is stored.

When you click on a network group you see the contents of that group. The network group is a conglomerate of all the values given to it by the network objects.

Related Information:

- Create or Edit a Firepower Network Object or Network Groups

Create or Edit a Firepower Network Object or Network Groups

A Firepower network object can contain a hostname, an IP address, or a subnet address expressed in CIDR notation. **Network groups** are conglomerates of network objects and network groups that are used in access rules, network policies, and NAT rules. You can create, read, update, and delete network objects and network groups using Cisco Defense Orchestrator (CDO).

Firepower network objects and groups can be used by ASA, threat defense, FDM-managed, and Meraki devices. See Reusing Network Objects Across Products, on page 106.

Note If cloud-delivered Firewall Management Center is deployed on your tenant:

When you create a network object or group on the or **Objects > FDM Objects** page, a copy of the object is automatically added to the **Objects > Other FTD Objects** page and vice-versa. In addition, an entry is created in the **Devices with Pending Changes** page for each on-prem management center with **Discover & Manage Network Objects** enabled, from which you can choose and deploy the objects to the on-prem management center on which you want these objects.

Caution If cloud-delivered Firewall Management Center is deployed on your tenant:

Changes you make to network objects and groups on the or **Objects > FDM Objects** page are reflected in the corresponding cloud-delivered Firewall Management Center network object or group on the **Objects > Other FTD Objects** page. In addition, an entry is created in the **Devices with Pending Changes** page for each on-prem management center with **Discover & Manage Network Objects** enabled, from which you can choose and deploy the changes to the on-prem management center on which you have these objects.

Deleting a network object or group from either page deletes the object or group from both pages.

Table 6: IP addresses that can be added to network objects

Device type	IPv4 / IPv6	Single Address	Range of addresses	Partially Qualified Domain Name (PQDN)	Subnet using CIDR Notation
Firepower	IPv4 / IPv6	Yes	Yes	Yes	Yes

Related Information:

- Create a Firepower Network Object, on page 108
- Edit a Firepower Network Object, on page 110
- Add Additional Values to a Shared Network Group, on page 113
- Edit Additional Values in a Shared Network Group, on page 114

Create a Firepower Network Object

Note If cloud-delivered Firewall Management Center is deployed on your tenant:

When you create a network object or group on the or **Objects > FDM Objects** page, a copy of the object is automatically added to the **Objects > Other FTD Objects** page and vice-versa. In addition, an entry is created in the **Devices with Pending Changes** page for each on-prem management center with **Discover & Manage Network Objects** enabled, from which you can choose and deploy the objects to the on-prem management center on which you want these objects.

Procedure

Step 1 In the CDO navigation bar on the left, click **Objects > FDM Objects**.

Step 2 Click the blue plus button to create an object.

Step 3 Click **FTD** > **Network**.

Step 4 Enter an **Object Name**.

Step 5 Select **Create a network object**.

Step 6 In the **Value** section:

- Select **eq** and enter a single IP address, a subnet address expressed in CIDR notation, or a Partially Qualified Domain Name (PQDN).
- Select **range** and enter an IP address range.

Note Do not set a host bit value. If you enter a host bit value other than 0, CDO unsets it while creating the object, because the cloud-delivered Firewall Management Center only accepts IPv6 objects with host bits not set.

Step 7 Click **Add**.

Attention: The newly created network objects aren't associated with any FDM-managed device as they aren't part of any rule or policy. To see these objects, select the **Unassociated** objects category in object filters. For more information, see Configure Object Filters. Once you use the unassociated objects in a device's rule or policy, such objects are associated with that device.

Create a Firepower Network Group

A **network group** can contain network objects and network groups. When you create a new network group, you can search for existing objects by their name, IP addresses, IP address range, or FQDN and add them to the network group. If the object isn't present, you can instantly create that object in the same interface and add it to the network group.

Note If cloud-delivered Firewall Management Center is deployed on your tenant:

When you create a network object or group on the or **Objects > FDM Objects** page, a copy of the object is automatically added to the **Objects > Other FTD Objects** page and vice-versa. In addition, an entry is created in the **Devices with Pending Changes** page for each on-prem management center with **Discover & Manage Network Objects** enabled, from which you can choose and deploy the objects to the on-prem management center on which you want these objects.

Procedure

Step 1 In the CDO navigation bar on the left, click **Objects > FDM Objects**.

Step 2 Click the blue plus button to create an object.

Step 3 Click **FTD** > **Network**.

Step 4 Enter an **Object Name**.

Step 5 Select **Create a network group**.

Step 6 In the **Values** field, enter a value or name. When you start typing, CDO provides object names or values that match your entry.

Step 7 You can choose one of the existing objects shown or create a new one based on the name or value that you have entered.

Step 8 If CDO finds a match, to choose an existing object, click **Add** to add the network object or network group to the new network group.

Step 9 If you have entered a value or object that is not present, you can perform one of the following:

- Click **Add as New Object With This Name** to create a new object with that name. Enter a value and click the checkmark to save it.
- Click **Add as New Object** to create a new object. The object name and value are the same. Enter a name and click the checkmark to save it.

It's is possible to create a new object even though the value is already present. You can make changes to those objects and save them.

Note: You can click the edit icon to modify the details. Clicking the delete button doesn't delete the object itself; instead, it removes it from the network group.

Step 10 After adding the required objects, click **Save** to create a new network group.

Step 11 Preview and Deploy Configuration Changes for All Devices.

Edit a Firepower Network Object

Caution If cloud-delivered Firewall Management Center is deployed on your tenant:

Changes you make to network objects and groups on the or **Objects > FDM Objects** page are reflected in the corresponding cloud-delivered Firewall Management Center network object or group on the **Objects > Other FTD Objects** page. In addition, an entry is created in the **Devices with Pending Changes** page for each on-prem management center with **Discover & Manage Network Objects** enabled, from which you can choose and deploy the changes to the on-prem management center on which you have these objects.

Deleting a network object or group from either page deletes the object or group from both pages.

Procedure

Step 1 In the CDO navigation bar on the left, click **Objects > FDM Objects**.

Step 2 Locate the object you want to edit by using object filters and search field.

Step 3 Select the network object and click the edit icon in the **Actions** pane.

Step 4 Edit the values in the dialog box in the same fashion that you created them in "Create a Firepower Network Group".

Note Click the delete icon next to remove the object from the network group.

Step 5 Click **Save**. CDO displays the devices that will be affected by the change.

Step 6 Click **Confirm** to finalize the change to the object and any devices affected by it.

Edit a Firepower Network Group

Caution If cloud-delivered Firewall Management Center is deployed on your tenant:

Changes you make to network objects and groups on the or **Objects > FDM Objects** page are reflected in the corresponding cloud-delivered Firewall Management Center network object or group on the **Objects > Other FTD Objects** page. In addition, an entry is created in the **Devices with Pending Changes** page for each on-prem management center with **Discover & Manage Network Objects** enabled, from which you can choose and deploy the changes to the on-prem management center on which you have these objects.

Deleting a network object or group from either page deletes the object or group from both pages.

Procedure

Step 1 In the CDO navigation bar on the left, click **Objects** > **FDM Objects**.

Step 2 Locate the network group you want to edit by using object filters and search field.

Step 3 Select the network group and click the edit icon  in the **Actions** pane.

Step 4 Change the object name and description if needed.

Step 5 If you want to change the objects or network groups that are already added to the network group, perform the following steps:

a. Click the edit icon  appearing beside the object name or network group to modify them.

b. Click the checkmark to save your changes. **Note**: You can click the remove icon to delete the value from a network group.

Step 6 If you want to add new network objects or network groups to this network group, you have to perform the following steps:

a. In the **Values** field, enter a new value or the name of an existing network object. When you start typing, CDO provides object names or values that match your entry. You can choose one of the existing objects shown or create a new one based on the name or value that you have entered.

b. If CDO finds a match, to choose an existing object, click **Add** to add the network object or network group to the new network group.

c. If you have entered a value or object that is not present, you can perform one of the following:

- Click **Add as New Object With This Name** to create a new object with that name. Enter a value and click the checkmark to save it.
- Click **Add as New Object** to create a new object. The object name and value are the same. Enter a name and click the checkmark to save it.

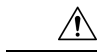
It's is possible to create a new object even though the value is already present. You can make changes to those objects and save them.

Step 7 Click **Save**. CDO displays the policies that will be affected by the change.

Step 8 Click **Confirm** to finalize the change to the object and any devices affected by it.

Step 9 Preview and Deploy Configuration Changes for All Devices.

Add an Object Override



Caution If cloud-delivered Firewall Management Center is deployed on your tenant:

Changes you make to network objects and groups on the or **Objects > FDM Objects** page are reflected in the corresponding cloud-delivered Firewall Management Center network object or group on the **Objects > Other FTD Objects** page. In addition, an entry is created in the **Devices with Pending Changes** page for each on-prem management center with **Discover & Manage Network Objects** enabled, from which you can choose and deploy the changes to the on-prem management center on which you have these objects.

Deleting a network object or group from either page deletes the object or group from both pages.

Procedure

Step 1 In the CDO navigation bar on the left, click **Objects > FDM Objects**.

Step 2 Locate the object to which you want to add an override, using object filters and search field.

Step 3 Select the network object and click the edit icon in the **Actions** pane.

Step 4 Enter the value in the **Override Values** dialog box and click **+ Add Value**.

Important The override you are adding must have the same type of value that the object contains. For example, to a network object, you can configure an override only with a network value and not a host value.

Step 5 Once you see that the value is added, click the cell in the **Devices** column in **Override Values**.

Step 6 Click **Add Devices**, and choose the device to which you want the override to be added. The device you select must contain the object to which you are adding the override.

Step 7 Click **Save**. CDO displays the devices that will be affected by the change.

Step 8 Click **Confirm** to finalize the addition of the override to the object and any devices affected by it.

Note You can add more than one override to an object. However, you must select a different device, which contains the object, each time you are adding an override.

Step 9 See Object Overrides, on page 98 to know more about object overrides and Edit Object Overrides , on page 112 to edit an existing override.

Edit Object Overrides

You can modify the value of an existing override as long as the object is present on the device.

Procedure

Step 1 In the CDO navigation bar on the left, click **Objects > FDM Objects**.

Step 2 Locate the object having override you want to edit by using object filters and search field.

Step 3 Select the object having override and click the edit icon in the Actions pane.

Step 4 Modify the override value:

- Click the edit icon to modify the value.
- Click on the cell in the **Devices** column in **Override Values** to assign new devices. You can select an already assigned device and click **Remove Overrides** to remove overrides on that device.
- Click arrow in **Override Values** to push and make it as the default value of the shared object.
- Click the delete icon next to the override you want to remove.

Step 5 Click **Save**. CDO displays the devices that will be affected by the change.

Step 6 Click **Confirm** to finalize the change to the object and any devices affected by it.

Step 7 Preview and Deploy Configuration Changes for All Devices.

Add Additional Values to a Shared Network Group

The values in a shared network group that are present on all devices associated with it are called "default values". CDO allows you to add "additional values" to the shared network group and assign those values to some devices associated with that shared network group. When CDO deploys the changes to the devices, it determines the contents and pushes the "default values" to all devices associated with the shared network group and the "additional values" only to the specified devices.

For example, consider a scenario where you have four AD main servers in your head office that should be accessible from all your sites. Therefore, you have created an object group named "Active-Directory" to use in all your sites. Now you want to add two more AD servers to one of your branch offices. You can do this by adding their details as additional values specific to that branch office on the object group "Active-Directory". These two servers do not participate in determining whether the object "Active-Directory" is consistent or shared. Therefore, the four AD main servers are accessible from all your sites, but the branch office (with two additional servers) can access two AD servers and four AD main servers.

Note If there are inconsistent shared network groups, you can combine them into a single shared network group with additional values. See Resolve Inconsistent Object Issues for more information.

Caution If cloud-delivered Firewall Management Center is deployed on your tenant:

Changes you make to network objects and groups on the or **Objects > FDM Objects** page are reflected in the corresponding cloud-delivered Firewall Management Center network object or group on the **Objects > Other FTD Objects** page. In addition, an entry is created in the **Devices with Pending Changes** page for each on-prem management center with **Discover & Manage Network Objects** enabled, from which you can choose and deploy the changes to the on-prem management center on which you have these objects.

Deleting a network object or group from either page deletes the object or group from both pages.

Procedure

Step 1 In the CDO navigation bar on the left, click **Objects > FDM Objects**.

Step 2 Locate the shared network group you want to edit by using object filters and search field.

Step 3 Click the edit icon in the **Actions** pane.

- The **Devices** field shows the devices the shared network group is present.
- The **Usage** field shows the rulesets associated with the shared network group.
- The **Default Values** field specifies the default network objects and their values associated with the shared network group that was provided during their creation. Next to this field, you can see the number of devices that contain this default value, and you can click to see their names and device types. You can also see the rulesets associated with this value.

Step 4 In the **Additional Values** field, enter a value or name. When you start typing, CDO provides object names or values that match your entry.

Step 5 You can choose one of the existing objects shown or create a new one based on the name or value that you have entered.

Step 6 If CDO finds a match, to choose an existing object, click **Add** to add the network object or network group to the new network group.

Step 7 If you have entered a value or object that is not present, you can perform one of the following:

- Click **Add as New Object With This Name** to create a new object with that name. Enter a value and click the checkmark to save it.
- Click **Add as New Object** to create a new object. The object name and value are the same. Enter a name and click the checkmark to save it.

It's is possible to create a new object even though the value is already present. You can make changes to those objects and save them.

Step 8 In the **Devices** column, click the cell associated with the newly added object and click **Add Devices**.

Step 9 Select the devices that you want and click **OK**.

Step 10 Click **Save**. CDO displays the devices that will be affected by the change.

Step 11 Click **Confirm** to finalize the change to the object and any devices affected by it.

Step 12 Preview and Deploy Configuration Changes for All Devices.

Edit Additional Values in a Shared Network Group

Caution If cloud-delivered Firewall Management Center is deployed on your tenant:

Changes you make to network objects and groups on the or **Objects > FDM Objects** page are reflected in the corresponding cloud-delivered Firewall Management Center network object or group on the **Objects > Other FTD Objects** page. In addition, an entry is created in the **Devices with Pending Changes** page for each on-prem management center with **Discover & Manage Network Objects** enabled, from which you can choose and deploy the changes to the on-prem management center on which you have these objects.

Deleting a network object or group from either page deletes the object or group from both pages.

Procedure

Step 1 In the CDO navigation bar on the left, click **Objects** > **FDM Objects**.

Step 2 Locate the object having the override you want to edit by using object filters and search field.

Step 3 Click the edit icon in the **Actions** pane.

Step 4 Modify the override value:

- Click the edit icon to modify the value.
- Click the cell in the **Devices** column to assign new devices. You can select an already assigned device and click **Remove Overrides** to remove overrides on that device.
- Click arrow in **Default Values** to push and make it an additional value of the shared network group. All devices associated with the shared network group are automatically assigned to it.
- Click arrow in **Override Values** to push and make it as default objects of the shared network group.
- Click the delete icon next to remove the object from the network group.

Step 5 Click **Save**. CDO displays the devices that will be affected by the change.

Step 6 Click **Confirm** to finalize the change to the object and any devices affected by it.

Step 7 Preview and Deploy Configuration Changes for All Devices.

Deleting Network Objects and Groups in CDO

If Cloud-delivered Firewall Management Center is deployed on your tenant:

Deleting a network object or group from the or **Objects** > **FDM Objects** page deletes the replicated network object or group from the **Objects** > **Other FTD Objects** page and vice-versa.

URL Objects

URL objects and URL groups are used by Firepower devices. Use URL objects and groups (collectively referred to as URL objects) to define the URL or IP addresses of web requests. You can use these objects to implement manual URL filtering in access control policies or blocking in Security Intelligence policies. A URL object defines a single URL or IP address, whereas a URL group defines more than one URL or IP address.

Before You Begin

When creating URL objects, keep the following points in mind:

- If you do not include a path (that is, there is no / character in the URL), the match is based on the server's hostname only. The hostname is considered a match if it comes after the :// separator, or after any dot in the hostname. For example, ign.com matches ign.com and www.ign.com, but it does not match verisign.com.
- If you include one or more / character, the entire URL string is used for a substring match, including the server name, path, and any query parameters. However, we recommend that you do not use manual URL filtering to block or allow individual web pages or parts of sites, as servers can be reorganized and pages

moved to new paths. Substring matching can also lead to unexpected matches, where the string you include in the URL object also matches paths on unintended servers or strings within query parameters.

- The system disregards the encryption protocol (HTTP vs HTTPS). In other words, if you block a website, both HTTP and HTTPS traffic to that website is blocked, unless you use an application condition to target a specific protocol. When creating a URL object, you do not need to specify the protocol when creating an object. For example, use example.com rather than http://example.com.
- If you plan to use a URL object to match HTTPS traffic in an access control rule, create the object using the subject common name in the public key certificate used to encrypt the traffic. Also, the system disregards subdomains within the subject common name, so do not include subdomain information. For example, use example.com rather than www.example.com.

  However, please understand that the subject common name in the certificate might be completely unrelated to a web site's domain name. For example, the subject common name in the certificate for youtube.com is *.google.com (this of course might change at any time). You will get more consistent results if you use the SSL Decryption policy to decrypt HTTPS traffic so that URL filtering rules work on decrypted traffic.

Note URL objects will not match HTTPS traffic if the browser resumes a TLS session because the certificate information is no longer available. So even if you carefully configure the URL object, you might get inconsistent results for HTTPS connections.

Create or Edit an FDM-Managed URL Object

URL objects are reusable components that specify a URL or IP address.

To create a URL object, follow these steps:

Procedure

Step 1 In the Cisco Defense Orchestrator navigation bar on the left, click **Objects > FDM Objects**.

Step 2 Click **Create Object** > **FTD** > **URL**.

Step 3 Enter an object name and description.

Step 4 Select **Create a URL object.**

Step 5 Enter the specific URL or IP address for your object.

Step 6 Click **Add**.

Create a Firepower URL Group

A URL group can be made up of one or more URL objects representing one or more URLs or IP addresses. The Firepower Device Manager and Firepower Management Center also refer to these objects as "URL Objects."

Procedure

Step 1 In the CDO navigation bar on the left, click **Objects > FDM Objects**.

Step 2 Click **Create Object** > **FTD** > **URL**.

Step 3 Enter an object name and description.

Step 4 Select **Create a URL group.**

Step 5 Add an existing object by clicking **Add Object,** selecting an object, and clicking **Select**. Repeat this step to add more objects.

Step 6 Click **Add** when you are done adding URL objects to the URL group.

Edit a Firepower URL Object or URL Group

Procedure

Step 1 In the CDO navigation bar on the left, click **Objects > FDM Objects**.

Step 2 Filter the objects to find the object you want to edit and then select the object in the object table.

Step 3 In the details pane, click  to edit.

Step 4 Edit the values in the dialog box in the same fashion that you created them in the procedures above.

Step 5 Click **Save**.

Step 6 CDO displays the policies that will be affected by the change. Click **Confirm** to finalize the change to the object and any policy affected by it.

Application Filter Objects

Application filter objects are used by Firepower devices. An application filter object defines the applications used in an IP connection, or a filter that defines applications by type, category, tag, risk, or business relevance. You can use these objects in policies to control traffic instead of using port specifications.

Although you can specify individual applications, application filters simplify policy creation and administration. For example, you could create an access control rule that identifies and blocks all high risk, low business relevance applications. If a user attempts to use one of those applications, the session is blocked.

You can select applications and application filters directly in a policy without using application filter objects. However, an object is convenient if you want to create several policies for the same group of applications or filters. The system includes several pre-defined application filters, which you cannot edit or delete.

Note Cisco frequently updates and adds additional application detectors via system and vulnerability database (VDB) updates. Thus, a rule blocking high risk applications can automatically apply to new applications without you having to update the rule manually.

Note When an FDM-managed device is onboarded to CDO, it converts the application filters to application filter objects without altering the rule defined in Access Rule or SSL Decryption. Because of a configuration change, the device's configuration status is changed to 'Not Synced' and requires configuration deployment from CDO. In general, FDM does not convert the application filters to application filter objects until you manually save the filters.

Related Information:

- Create and Edit a Firepower Application Filter Object
- Deleting Objects

Create and Edit a Firepower Application Filter Object

An application filter object allows you to target hand-picked applications or a group of applications identified by the filters. This application filter objects can be used in policies.

Create a Firepower Application Filter Object

To create an application filter object, follow this procedure:

Procedure

Step 1 In the CDO navigation bar on the left, click **Objects > FDM Objects**.

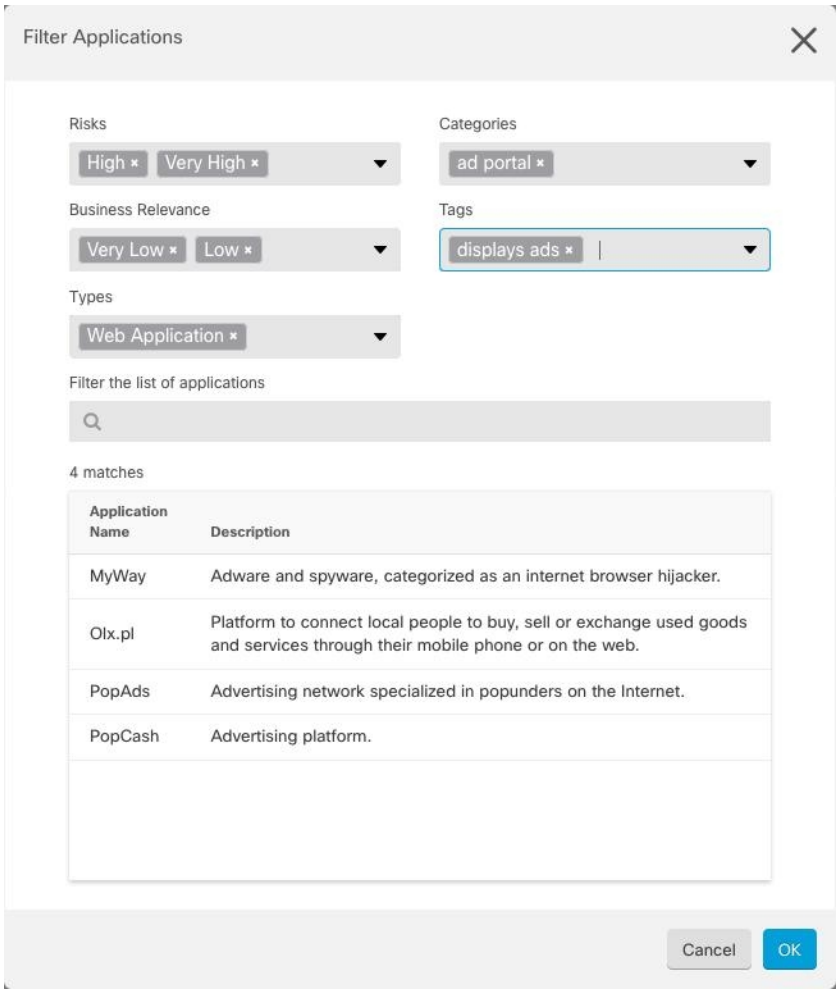
Step 2 Click **Create Object > FTD > Application Service**.

Step 3 Enter an **object name** for the object and optionally, a **description**.

Step 4 Click **Add Filter** and select the applications and filters to add to the object.

The initial list shows applications in a continually scrolling list. Click **Advanced Filter** to see the filter options and to get an easier view for selecting applications. Click **Add** when you have made your selections. You can repeat the process to add additional applications or filters.

Note Multiple selections within a single filter criteria have an OR relationship. For example, Risk is High OR Very High. The relationship between filters is AND, so Risk is High OR Very High, AND Business Relevance is Low OR Very Low. As you select filters, the list of applications in the display updates to show only those that meet the criteria. You can use these filters to help you find applications that you want to add individually, or to verify that you are selecting the desired filters to add to the rule.



Risks: The likelihood that the application is used for purposes that might be against your organization's security policy, from very low to very high.

Business Relevance: The likelihood that the application is used within the context of your organization's business operations, as opposed to recreationally, from very low to very high.

Types: The type of application.

- **Application Protocol:** Application protocols such as HTTP and SSH, which represent communications between hosts.
- **Client Protocol:** Clients such as web browsers and email clients, which represent software running on the host.
- **Web Application:** Web applications such as MPEG video and Facebook, which represent the content or requested URL for HTTP traffic.

Categories: A general classification for the application that describes its most essential function.

Tags: Additional information about the application, similar to category.

For encrypted traffic, the system can identify and filter traffic using only the applications tagged SSL Protocol. Applications without this tag can only be detected in unencrypted or decrypted traffic. Also, the system assigns

the decrypted traffic tag to applications that the system can detect in decrypted traffic only, not encrypted or unencrypted.

Applications List (bottom of the display): This list updates as you select filters from the options above the list, so you can see the applications that currently match the filter. Use this list to verify that your filter is targeting the desired applications when you intend to add filter criteria to the rule. To add a specific application or applications to your object, select them from the filtered list. Once you select the applications, the filter will no longer apply. If you want the filter itself to be the object, do not select an application from the list. Then the object will represent ever application identified by the filter.

Step 5 Click **OK** to save your changes.

Edit a Firepower Application Filter Object

Procedure

Step 1 In the CDO navigation bar on the left, click **Objects > FDM Objects**.

Step 2 Locate the object you want to edit by using object filters and search field.

Step 3 Select the object you want to edit.

Step 4 Click the edit icon  in the Actions pane of the details panel.

Step 5 Edit the values in the dialog box in the same fashion that you created them in the procedures above.

Step 6 Click **Save**.

Step 7 CDO displays the policies that will be affected by the change. Click **Confirm** to finalize the change to the object and any policy affected by it.

Related Information:

- Objects
- Object Filters
- Deleting Objects

Geolocation Objects

A geolocation object defines countries and continents that host the device that is the source or destination of traffic. You can use these objects in policies to control traffic instead of using IP addresses. For example, using geographical location, you could easily restrict access to a particular country without needing to know all of the potential IP addresses used there.

You can typically select geographical locations directly in a policy without using geolocation objects. However, an object is convenient if you want to create several policies for the same group of countries and continents.

Update Geolocation Database

To ensure that you are using up-to-date geographical location data to filter your traffic, Cisco strongly recommends that you regularly update the geolocation database (GeoDB). At this time, this is not a task that

you can perform using Cisco Defense Orchestrator. See the following sections of the Cisco Firepower Threat Defense Configuration Guide for Firepower Device Manager for the version your device is running to learn more about the GeoDB and how to update it.

- Updating System Databases and Feeds
- Updating System Databases

Create and Edit a Firepower Geolocation Filter Object

You can create a geolocation object by itself on the object page or when creating a security policy. This procedure creates a geolocation object from the object page.

To create a geolocation object, follow these steps:

Procedure

Step 1 In the CDO navigation bar on the left, click **Objects > FDM Objects**.

Step 2 Click **Create Object** > **FTD** > **Geolocation**.

Step 3 Enter an **object name** for the object and optionally, a **description**.

Step 4 In the filter bar, start typing the name of a country or a region and you are presented with a list of possible matches.

Step 5 Check the country, countries, or regions that you want to add to the object.

Step 6 Click **Add**.

Edit a Geolocation Object

Procedure

Step 1 In the CDO navigation bar on the left, click **Objects > FDM Objects**.

Step 2 Use the filter panes and search field to locate your object.

Step 3 In the Actions pane, click **Edit**.

Step 4 You can change the name of the object and add or remove countries and regions to your object.

Step 5 Click **Save**.

Step 6 You will be notified if any devices are impacted. Click **Confirm**.

Step 7 If a device or policy was impacted, open the **Inventory** page and **Preview and Deploy** the changes to the device.

DNS Group Objects

Domain Name System (DNS) groups define a list of DNS servers and some associated attributes. DNS servers are needed to resolve fully-qualified domain names (FQDN), such as www.example.com, to IP addresses. You can configure different DNS group objects for management and data interfaces.

FDM-managed devices must have a DNS server configured prior to creating a new DNS Group Object. You can either add a DNS Server to the Firepower Threat Defense Device Settings in Cisco Defense Orchestrator (CDO) or create a DNS server in firewall device manager and then sync the FDM-managed configuration to CDO. To create or modify the DNS server settings in firewall device manager, see **Configuring DNS for Data and Management Interfaces** in the Cisco Firepower Device Manager Configuration Guide, Version 6.4. or later.

Create a DNS Group Object

Use the following procedure to create a new DNS group object in CDO:

Procedure

Step 1 In the CDO navigation bar on the left, click **Objects > FDM Objects**.

Step 2 Click the blue plus button  to create an object.

Step 3 Click **FTD** > **DNS Group**.

Step 4 Enter an **Object Name**.

Step 5 (Optional) Add a description.

Step 6 Enter the IP address of a **DNS server**. You can add up to six DNS servers; click the **Add DNS Server**. If you want to remove a server address, click the delete icon.

Note The list is in priority order: the first server in the list is always used, and subsequent servers are used only if a response is not received from the servers above it. Although you can add up to six servers, only the first 3 servers listed will be used for the management interface.

Step 7 Enter the **Domain Search Name**. This domain is added to hostnames that are not fully-qualified, for example, serverA instead of serverA.example.com.

Step 8 Enter the amount of **Retries**. The number of times, from 0 to 10, to retry the list of DNS servers when the system does not receive a response. The default is 2. This setting applies to DNS groups used on the data interfaces only.

Step 9 Enter the **Timeout** value. The number of seconds, from 1 to 30, to wait before trying the next DNS server. The default is 2 seconds. Each time the system retries the list of servers, this timeout doubles. This setting applies to DNS groups used on the data interfaces only.

Step 10 Click **Add**.

Edit a DNS Group Object

You can edit a DNS group object that was created in Cisco Defense Orchestrator or in firewall device manager. Use the following procedure to edit an existing DNS group object:

Procedure

Step 1 In the CDO navigation bar on the left, click **Objects > FDM Objects**.

Step 2 Locate the **DNS Group Object** you want to edit by using object filters and search field.

Step 3 Select the object and click the edit icon in the **Actions** pane.

Step 4 Edit any of the following entries:

- Object Name.
- Description.
- DNS Server. You can edit, add, or remove DNS servers from this list.
- Domain Search Name.
- Retries.
- Timeout.

Step 5 Click **Save**.

Step 6 Preview and Deploy Configuration Changes for All Devices.

Delete a DNS Group Object

Use the following procedure to delete a DNS Group Object from CDO:

Procedure

Step 1 In the CDO navigation bar on the left, click **Objects** > **FDM Objects**.

Step 2 Locate the **DNS Group Object** you want to edit by using object filters and search field.

Step 3 Select the object and click the **Remove** icon .

Step 4 Confirm you want to delete the DNS group object and click **Ok**.

Step 5 Preview and Deploy Configuration Changes for All Devices.

Add a DNS Group Object as an FDM-Managed DNS Server

You can add a DNS group object as the preferred DNS Group for either the **Data Interface** or the **Management Interface**. See FDM-Managed Device Settings for more information.

Certificate Objects

Digital certificates provide digital identification for authentication. Certificates are used for SSL (Secure Socket Layer), TLS (Transport Layer Security), and DTLS (Datagram TLS) connections, such as HTTPS and LDAPS.

See the **About Certificates** and **Configuring Certificates** following sections of the Resuable Objects chapter of the Cisco Firepower Threat Defense Configuration Guide for Firepower Device Manager for the version your device is running.

About Certificates

Digital certificates provide digital identification for authentication. A digital certificate includes information that identifies a device or user, such as the name, serial number, company, department, or IP address. A digital certificate also includes a copy of the public key for the user or device. Certificates are used for SSL (Secure Socket Layer), TLS (Transport Layer Security), and DTLS (Datagram TLS) connections, such as HTTPS and LDAPS.

You can create the following types of certificate:

- **Internal certificates**—Internal identity certificates are certificates for specific systems or hosts. You can generate these yourself using the OpenSSL toolkit or get them from a Certificate Authority. You can also generate a self-signed certificate.

  The system comes with the following pre-defined internal certificates, which you can use as is or replace: **DefaultInternalCertificate** and **DefaultWebServerCertificate**

- **Internal Certificate Authority (CA)** certificates—Internal CA certificates are certificates that the system can use to sign other certificates. These certificates differ from internal identity certificates with respect to the basic constraints extension and the CA flag, which are enabled for CA certificates but disabled for identity certificates. You can generate these yourself using the OpenSSL toolkit or get them from a Certificate Authority. You can also generate a self-signed internal CA certificate. If you configure self-signed internal CA certificates, the CA runs on the device itself.

  The system comes with the following pre-defined internal CA certificate, which you can use as is or replace: **NGFW-Default-InternalCA**

- **Trusted Certificate Authority (CA)** certificates—A trusted CA certificate is used to sign other certificates. It is self-signed and called a root certificate. A certificate that is issued by another CA certificate is called a subordinate certificate.

  Certificate Authorities (CAs) are trusted authorities that "sign" certificates to verify their authenticity, thereby guaranteeing the identity of the device or user. CAs issue digital certificates in the context of a PKI, which uses public-key or private-key encryption to ensure security. A CA can be a trusted third party, such as VeriSign, or a private (in-house) CA that you establish within your organization. CAs are responsible for managing certificate requests and issuing digital certificates.

  The system includes many trusted CA certificates from third party Certificate Authorities. These are used by SSL decryption policies for Decrypt Re-Sign actions.

For more information, see the **Certificate Types Used by Feature** section of the Reusable Objects chapter of the Cisco Firepower Threat Defense Configuration Guide for Firepower Device Manager for the version your device is running.

Certificate Types Used by Feature

You need to create the right type of certificate for each feature. The following features require certificates.

Identity Policies (Captive Portal)—Internal Certificate

(Optional.) Captive portal is used in identity policies. Users must accept this certificate when authenticating to the device for purposes of identifying themselves and receiving the IP address associated with their usernames. If you do not supply a certificate, the device uses an automatically generated certificate.

SSL Decryption Policy—Internal, Internal CA, and Trusted CA Certificates.

(Required.) The SSL decryption policy uses certificates for the following purposes:

- Internal certificates are used for known key decryption rules.
- Internal CA certificates are used for decrypt re-sign rules when creating the session between the client and FDM-managed device.
- Trusted CA certificates
  - They are used indirectly for decrypt re-sign rules when creating the session between the FDM-managed device and server. Unlike the other certificates, you do not directly configure these certificates in the SSL decryption policy; they simply need to be uploaded to the system. The system includes a large number of trusted CA certificates, so you might not need to upload any additional certificates.
  - When creating an Active Directory Realm object and configuring the directory server to use encryption.

Configuring Certificates

Certificates used in identity policies or SSL decryption policies must be an X509 certificate in PEM or DER format. You can use OpenSSL to generate certificates if needed, obtain them from a trusted Certificate Authority, or create self-signed certificates.

Use these procedures to configure certificate objects:

- Uploading Internal and Internal CA Certificates
- Uploading Trusted CA Certificates
- Generating Self-Signed Internal and Internal CA Certificates
- To view or edit a certificate, click either the edit icon or the view icon for the certificate.
- To delete an unreferenced certificate, click the trash can icon (delete icon) for the certificate. See Deleting Objects.

Uploading Internal and Internal CA Certificates

Internal identity certificates are certificates for specific systems or hosts. You can generate these yourself using the OpenSSL toolkit or get them from a Certificate Authority. You can also generate a self-signed certificate.

Internal Certificate Authority (CA) certificates (Internal CA certificates) are certificates that the system can use to sign other certificates. These certificates differ from internal identity certificates with respect to the basic constraints extension and the CA flag, which are enabled for CA certificates but disabled for identity certificates. You can generate these yourself using the OpenSSL toolkit or get them from a Certificate Authority. You can also generate a self-signed internal CA certificate. If you configure self-signed internal CA certificates, the CA runs on the device itself.

For information on the features that use these certificates, see Certificate Types Used by Feature.

Procedure

This procedure creates an internal or internal CA certificate by uploading a certificate file or pasting existing certificate text into a text box. If you want to generate a self signed certificate, see Generating Self-Signed Internal and Internal CA Certificates.

To create an internal or internal CA certificate object, or when adding a new certificate object to a policy, follow this procedure:

Procedure

Step 1 Do one of the following:

- Create the certificate object in the Objects page:
  a. In the CDO navigation bar on the left, click **Objects > FDM Objects**.
  b. Click the plus button and select **FTD** > **Certificate**
- Click **Create New Object** when adding a new certificate object to a policy.

Step 2 Enter a **Name** for the certificate. The name is used in the configuration as an object name only, it does not become part of the certificate itself.

Step 3 In step 1, select **Internal Certificate** or **Internal CA.**

Step 4 In step 2, select **Upload** to upload the certificate file.

Step 5 In step 3, in the **Server Certificate** area, paste the certificate contents in the text box or upload the certificate file as explained in the wizard. If you paste the certificate into the text box, the certificate must include the BEGIN CERTIFICATE and END CERTIFICATE lines. For example:

```
-----BEGIN CERTIFICATE-----
 MIICMTCCAZoCCQDdUV3NGK/cUjANBgkqhkiG9w0BAQsFADBdMQswCQYDVQQGEwJV
UzETMBEGA1UECAwKU29tZS1TdGF0ZTEhMB8GA1UECgwYSW50ZXJuZXQgV2lkZ2l0
(...5 lines removed...)
shGJDReRYJQqilhHZrYTWZAYTrD7NQPHutK+ZiJng67cPgnNDuXEn55UwMOQoHBp
HMUwmhiGZlzJM8BpX2Js2yQ3ms30pr8rO+gPCPMCAwEAATANBgkqhkiG9w0BAQsF
AAOBgQCB02CebA6YjJCGr2CJZrQSeUwSveRBpmOuoqm98o2Z+5gJM5CkqgfxwCUn
RV7LRfQGFYd76V/5uor4Wx2ZCjqy6+zuQEm4ZxWNSZpA9UBixFXJCs9MBO4qkG5D
vlk3WYJfcgyJ10h4E4b0W2xiixBU+xoOTLRATnbKY36EWAG5cw==
-----END CERTIFICATE-----
```

Step 6 In step 3, in the **Certificate Key** area, paste the key contents into the Certificate Key text box or upload the key file as explained in the wizard. If you paste the key into the text box, the key must include the BEGIN PRIVATE KEY or BEGIN RSA PRIVATE KEY and END PRIVATE KEY or END PRIVATE KEY lines.

Note The key cannot be encrypted.

Step 7 Click **Add**.

Uploading Trusted CA Certificates

A trusted Certificate Authority (CA) certificate is used to sign other certificates. It is self-signed and called a root certificate. A certificate that is issued by another CA certificate is called a subordinate certificate.

For information on the features that use these certificates, see Certificate Types Used by Feature.

Obtain a trusted CA certificate from an external certificate authority, or create one using your own internal CA, for example, with OpenSSL tools. Then, use the following procedure to upload the certificate.

Procedure

Procedure

Step 1 Do one of the following:

- Create the certificate object in the Objects page:
  a. In the CDO navigation bar on the left, click **Objects > FDM Objects**.
  b. Click the plus button  and select **FTD** > **Certificate**.
- Click **Create New Object** when adding a new certificate object to a policy.

Step 2 Enter a **Name** for the certificate. The name is used in the configuration as an object name only, it does not become part of the certificate itself.

Step 3 In step 1, select **External CA Certificate** and click **Continue**. The wizard advances to step 3.

Step 4 In step 3, in the **Certificate Contents** area, paste the certificate contents in the text box or upload the certificate file as explained in the wizard.

The certificate must follow these guidelines:

- The name of the server in the certificate must match the server Hostname / IP Address. For example, if you use 10.10.10.250 as the IP address but ad.example.com in the certificate, the connection fails.
- The certificate must be an X509 certificate in PEM or DER format.
- The certificate you paste must include the BEGIN CERTIFICATE and END CERTIFICATE lines. For example:

```
-----BEGIN CERTIFICATE-----
MIIFgTCCA2mgAwIBAgIJANvdcLnabFGYMA0GCSqGSIb3DQEBCwUAMFcxCzAJBgNV
BAYTAlVTMQswCQYDVQQIDAJUWDEPMA0GA1UEBwwGYXVzdGluMRQwEgYDVQQKDAsx
OTIuMTY4LjEuMTEUMBIGA1UEAwwLMTkyLjE2OC4xLjEwHhcNMTYxMDI3MjIzNDE3
WhcNMTcxMDI3MjIzNDE3WjBXMQswCQYDVQQGEwJVUzELMAkGA1UECAwCVFgxDzAN
BgNVBAcMBmF1c3RpbjEUMBIGA1UECgwLMTkyLjE2OC4xLjExFDASBgNVBAMMCzE5
Mi4xNjguMS4xMIICIjANBgkqhkiG9w0BAQEFAAOCAg8AMIICCgKCAgEA5NceYwtP
ES6Ve+S9z7WLKGX5JlF58AvH82GPkOQdrixn3FZeWLQapTpJZt/vgtAI2FZIK31h
(...20 lines removed...)
hbr6HOgKlOwXbRvOdksTzTEzVUqbgxt5Lwupg3b2ebQhWJz4BZvMsZX9etveEXDh
PY184V3yeSeYjbSCF5rP71fObG9Iu6+u4EfHp/NQv9s9dN5PMffXKieqpuN20Ojv
2b1sfOydf4GMUKLBUMkhQnip6+3W
-----END CERTIFICATE-----
```

Step 5 Click **Add**.

Generating Self-Signed Internal and Internal CA Certificates

Internal identity certificates are certificates for specific systems or hosts. You can generate these yourself using the OpenSSL toolkit or get them from a Certificate Authority. You can also generate a self-signed certificate.

Internal Certificate Authority (CA) certificates (Internal CA certificates) are certificates that the system can use to sign other certificates. These certificates differ from internal identity certificates with respect to the basic constraints extension and the CA flag, which are enabled for CA certificates but disabled for identity certificates. You can generate these yourself using the OpenSSL toolkit or get them from a Certificate Authority. You can also generate a self-signed internal CA certificate. If you configure self-signed internal CA certificates, the CA runs on the device itself.

You can also create these certificates using OpenSSL, or obtain them from a trusted CA, and upload them. For more information, see Uploading Internal and Internal CA Certificates.

For information on the features that use these certificates, see Certificate Types Used by Feature.

Note New self-signed certificates are generated with a 5-year validity term. Be sure to replace certificates before they expire.

Warning Upgrading devices that have self-signed certificates may experience issues; see New Certificate Detected for more information.

Procedure

This procedure generates a self-signed certificate by entering the appropriate certificate field values in a wizard. If you want to create an internal or internal CA certificate by uploading a certificate file, see Uploading Internal and Internal CA Certificates.

To generate a self-signed certificate, follow this procedure:

Procedure

Step 1 Do one of the following:

- Create the certificate object in the Objects page:
  - **a.** In the CDO navigation bar on the left, click **Objects > FDM Objects**.
  - **b.** Click the plus button and select **FTD** > **Certificate**.
- Click **Create New Object** when adding a new certificate object to a policy.

Step 2 Enter a **Name** for the certificate. The name is used in the configuration as an object name only, it does not become part of the certificate itself.

Step 3 In step 1, select **Internal Certificate** or **Internal CA.**

Step 4 In step 2, select **Self-Signed** to create the self-signed certificate in this step.

Step 5 Configure at least one of the following for the certificate subject and issuer information.

- Country (C)— Select the country code from the drop-down list.
- State or Province (ST)— The state or province to include in the certificate.

- Locality or City (L)— The locality to include in the certificate, such as the name of the city.
- Organization (O)— The organization or company name to include in the certificate.
- Organizational Unit (Department) (OU)— The name of the organization unit (for example, a department name) to include in the certificate.
- Common Name (CN)— The X.500 common name to include in the certificate. This could be the name of the device, web site, or another text string. This element is usually required for successful connections. For example, you must include a CN in the internal certificate used for remote access VPN.

Step 6 Click **Add**.

About IPsec Proposals

IPsec is one of the most secure methods for setting up a VPN. IPsec provides data encryption at the IP packet level, offering a robust security solution that is standards-based. With IPsec, data is transmitted over a public network through tunnels. A tunnel is a secure, logical communication path between two peers. Traffic that enters an IPsec tunnel is secured by a combination of security protocols and algorithms called a transform set. During the IPsec security association (SA) negotiation, peers search for a transform set that is the same at both peers.

There are separate IPsec proposal objects based on the IKE version, IKEv1, or IKEv2:

- When you create an IKEv1 IPsec proposal, you select the mode in which IPsec operates, and define the required encryption and authentication types. You can select single options for the algorithms. If you want to support multiple combinations in a VPN, create and select multiple IKEv1 IPsec Proposal objects.
- When you create an IKEv2 IPsec proposal, you can select all of the encryption and hash algorithms allowed in a VPN. The system orders the settings from the most secure to the least secure and negotiates with the peer until a match is found. This allows you to potentially send a single proposal to convey all the allowed combinations instead of the need to send each allowed combination individually as with IKEv1.

The Encapsulating Security Protocol (ESP) is used for both IKEv1 and IKEv2 IPsec proposals. It provides authentication, encryption, and antireplay services. ESP is IP protocol type 50.

Note We recommend using both encryption and authentication on IPsec tunnels.

The following topics explain how to configure IPsec proposals for each IKE version:

- Managing an IKEv1 IPsec Proposal Object
- Managing an IKEv2 IPsec Proposal Object

Managing an IKEv1 IPsec Proposal Object

IPsec Proposal objects configure the IPsec proposal used during IKE Phase 2 negotiations. The IPsec proposal defines the combination of security protocols and algorithms that secure traffic in an IPsec tunnel. There are

separate objects for IKEv1 and IKEv2. Currently, Cisco Defense Orchestrator (CDO) supports IKEv1 IPsec proposal objects.

The Encapsulating Security Protocol (ESP) is used for both IKEv1 and IKEv2 IPsec proposals. It provides authentication, encryption, and anti-replay services. ESP is IP protocol type 50.

Note We recommend using both encryption and authentication on IPsec tunnels.

Related Topics

Create an IKEv1 IPsec Proposal Object

Create or Edit an IKEv1 IPsec Proposal Object

There are several pre-defined IKEv1 IPsec proposals. You can also create new proposals to implement other combinations of security settings. You cannot edit or delete system-defined objects.

The following procedure explains how you can create and edit objects directly through the Objects page. You can also create IKEv1 IPsec Proposals objects while editing the IKEv1 IPsec settings in a Site-to-Site VPN connection by clicking the **Create New IKEv1 Proposal** link shown in the object list.

Procedure

Step 1 In the CDO navigation bar on the left, click **Objects > FDM Objects**.

Step 2 Do one of these things:

- Click the blue plus button and select **FTD > IKEv1 IPsec Proposal** to create the new object.
- In the object page, select the IPsec proposal you want to edit and click **Edit** in the Actions pane at the right.

Step 3 Enter an **object name** for the new object.

Step 4 Select the Mode in which the IKEv1 IPsec Proposal object operates.

- **Tunnel mode** encapsulates the entire IP packet. The IPSec header is added between the original IP header and a new IP header. This is the default. Use tunnel mode when the firewall is protecting traffic to and from hosts positioned behind the firewall. Tunnel mode is the normal way regular IPSec is implemented between two firewalls (or other security gateways) that are connected over an untrusted network, such as the Internet.
- **Transport mode** encapsulates only the upper-layer protocols of an IP packet. The IPSec header is inserted between the IP header and the upper-layer protocol header (such as TCP). Transport mode requires that both the source and destination hosts support IPSec, and can only be used when the destination peer of the tunnel is the final destination of the IP packet. Transport mode is generally used only when protecting a Layer 2 or Layer 3 tunneling protocol such as GRE, L2TP, and DLSW.

Step 5 Select the **ESP Encryption** (Encapsulating Security Protocol encryption) algorithm for this proposal. For an explanation of the options, see Deciding Which Encryption Algorithm to Use.

Step 6 Select the **ESP Hash** or integrity algorithm to use for authentication. For an explanation of the options, see Deciding Which Hash Algorithms to Use.

Step 7 Click **Add**.

Managing an IKEv2 IPsec Proposal Object

IPsec Proposal objects configure the IPsec proposal used during IKE Phase 2 negotiations. The IPsec proposal defines the combination of security protocols and algorithms that secure traffic in an IPsec tunnel.

When you create an IKEv2 IPsec proposal, you can select all of the encryption and hash algorithms allowed in a VPN. The system orders the settings from the most secure to the least secure and negotiates with the peer until a match is found. This allows you to potentially send a single proposal to convey all the allowed combinations instead of the need to send each allowed combination individually as with IKEv1.

Related Topics

Create or Edit an IKEv2 IPsec Proposal Object

Create or Edit an IKEv2 IPsec Proposal Object

There are several pre-defined IKEv2 IPsec proposals. You can also create new proposals to implement other combinations of security settings. You cannot edit or delete system-defined objects.

The following procedure explains how you can create and edit objects directly through the Objects page. You can also create IKEv2 IPsec Proposals objects while editing the IKEv2 IPsec settings in a VPN connection by clicking the Create New IPsec Proposal link shown in the object list.

Procedure

Step 1 In the CDO navigation bar on the left, click **Objects > FDM Objects**.

Step 2 Do one of these things:

- Click the blue plus button  and select **FTD > IKEv2 IPsec Proposal** to create the new object.
- In the object page, select the IPsec proposal you want to edit and click **Edit** in the Actions pane at the right.

Step 3 Enter an **object name** for the new object.

Step 4 Configure the IKE2 IPsec proposal objects:

- **Encryption**—The Encapsulating Security Protocol (ESP) encryption algorithm for this proposal. Select all the algorithms that you want to allow. The system negotiates with the peer, starting from the strongest to the weakest algorithm until a match is agreed upon. For an explanation of the options, see Deciding Which Encryption Algorithm to Use.
- **Integrity Hash**—The hash or integrity algorithm to use for authentication. Select all the algorithms that you want to allow. The system negotiates with the peer, starting from the strongest to the weakest algorithm until a match is agreed upon. For an explanation of the options, see Deciding Which Hash Algorithms to Use.

Step 5 Click **Add**.

About Global IKE Policies

Internet Key Exchange (IKE) is a key management protocol that is used to authenticate IPsec peers, negotiate and distribute IPsec encryption keys, and automatically establish IPsec security associations (SAs).

The IKE negotiation comprises two phases. Phase 1 negotiates a security association between two IKE peers, which enables the peers to communicate securely in Phase 2. During Phase 2 negotiation, IKE establishes SAs for other applications, such as IPsec. Both phases use proposals when they negotiate a connection. An IKE proposal is a set of algorithms that two peers use to secure the negotiation between them. IKE negotiation begins by each peer agreeing on a common (shared) IKE policy. This policy states which security parameters are used to protect subsequent IKE negotiations.

IKE policy objects define the IKE proposals for these negotiations. The objects that you enable are the ones used when the peers negotiate a VPN connection: you cannot specify different IKE policies per connection. The relative priority of each object determines which of these policies are tried first, with the lower number being a higher priority. The connection is not established if the negotiation fails to find a policy that both peers can support.

To define the global IKE policy, you select which objects to enable for each IKE version. If the pre-defined objects do not satisfy your requirements, create new policies to enforce your security policy.

The following procedure explains how to configure the global policy through the Objects page. You can also enable, disable, and create policies when editing a VPN connection by clicking Edit for the IKE Policy settings.

The following topics explain how to configure IKE policies for each version:

- Managing IKEv1 Policies
- Managing IKEv2 Policies

Managing IKEv1 Policies

About IKEv1 Policy

Internet Key Exchange (IKE) version 1 policy objects contain the parameters required for IKEv1 policies when defining VPN connections. IKE is a key management protocol that facilitates the management of IPsec-based communications. It is used to authenticate IPsec peers, negotiate and distribute IPsec encryption keys, and automatically establish IPsec security associations (SAs).

There are several pre-defined IKEv1 policies. If any suit your needs, simply enable them by clicking the State toggle. You can also create new policies to implement other combinations of security settings. You cannot edit or delete system-defined objects.

Related Topics

Create an IKEv1 Policy

Create or Edit an IKEv1 Policy

The following procedure explains how you can create and edit objects directly through the Objects page. You can also create an IKEv1 policy while editing the IKE settings in a Site-to-Site VPN connection by clicking the **Create New IKEv1 Policy** link shown in the object list.

Procedure

Step 1 In the CDO navigation bar on the left, click **Objects > FDM Objects**.

Step 2 Do one of these things:

- Click the blue plus button  and select **FTD > IKEv1 Policy** to create a new IKEv1 policy.
- In the object page, select the IKEv1 policy you want to edit and click **Edit** in the Actions pane at the right.

Step 3 Enter an **object name**, up to 128 characters.

Step 4 Configure the IKEv1 properties.

- **Priority**—The relative priority of the IKE policy, from 1 to 65,535. The priority determines the order of the IKE policy compared by the two negotiating peers when attempting to find a common security association (SA). If the remote IPsec peer does not support the parameters selected in your highest priority policy, it tries to use the parameters defined in the next lowest priority. The lower the number, the higher the priority.
- **Encryption**—The encryption algorithm used to establish the Phase 1 security association (SA) for protecting Phase 2 negotiations. For an explanation of the options, see Deciding Which Encryption Algorithm to Use.
- **Diffie-Hellman Group**—The Diffie-Hellman group to use for deriving a shared secret between the two IPsec peers without transmitting it to each other. A larger modulus provides higher security but requires more processing time. The two peers must have a matching modulus group. For an explanation of the options, see Deciding Which Diffie-Hellman Modulus Group to Use.
- **Lifetime**—The lifetime of the security association (SA), in seconds, from 120 to 2147483647 or blank. When the lifetime is exceeded, the SA expires and must be renegotiated between the two peers. As a general rule, the shorter the lifetime (up to a point), the more secure your IKE negotiations will be. However, with longer lifetimes, future IPsec security associations can be set up more quickly than with shorter lifetimes. The default is 86400. To specify an unlimited lifetime, enter no value (leave the field blank).
- **Authentication**—The method of authentication to use between the two peers. For more information, see Deciding Which Authentication Method to Use.
  - **Preshared Key**—Use the preshared key that is defined on each device. These keys allow for a secret key to be shared between two peers and to be used by IKE during the authentication phase. If the peer is not configured with the same preshared key, the IKE SA cannot be established.
  - **Certificate**—Use the device identity certificates for the peers to identify each other. You must obtain these certificates by enrolling each peer in a Certificate Authority. You must also upload the trusted CA root and intermediate CA certificates used to sign the identity certificates in each peer. The peers can be enrolled in the same or a different CA. You cannot use self-signed certificates for either peer.
- **Hash**—The hash algorithm for creating a message digest, which is used to ensure message integrity. For an explanation of the options, see Encryption and Hash Algorithms Used in VPN.

Step 5 Click **Add**.

Managing IKEv2 Policies

About IKEv2 Policy

Internet Key Exchange (IKE) version 2 policy objects contain the parameters required for IKEv2 policies when defining VPN connections. IKE is a key management protocol that facilitates the management of IPsec-based communications. It is used to authenticate IPsec peers, negotiate and distribute IPsec encryption keys, and automatically establish IPsec security associations (SAs).

There are several pre-defined IKEv2 policies. If any suit your needs, simply enable them by clicking the State toggle. You can also create new policies to implement other combinations of security settings. You cannot edit or delete system-defined objects.

Related Topics

Create an IKEv2 Policy

Create or Edit an IKEv2 Policy

The following procedure explains how you can create and edit objects directly through the Objects page. You can also create an IKEv2 policy while editing the IKE settings in a Site-to-Site VPN connection by clicking the **Create New IKEv2 Policy** link shown in the object list.

Procedure

Step 1 In the CDO navigation bar on the left, click **Objects > FDM Objects**.

Step 2 Do one of these things:

- Click the blue plus button and select **FTD > IKEv2 Policy** to create a new IKEv2 policy.
- In the object page, select the IKEv2 policy you want to edit and click **Edit** in the Actions pane at the right.

Step 3 Enter an **object name**, up to 128 characters.

Step 4 Configure the IKEv2 properties.

- **Priority**—The relative priority of the IKE policy, from 1 to 65,535. The priority determines the order of the IKE policy compared by the two negotiating peers when attempting to find a common security association (SA). If the remote IPsec peer does not support the parameters selected in your highest priority policy, it tries to use the parameters defined in the next lowest priority. The lower the number, the higher the priority.
- **State**—Whether the IKE policy is enabled or disabled. Click the toggle to change the state. Only enabled policies are used during IKE negotiations.
- **Encryption**—The encryption algorithm used to establish the Phase 1 security association (SA) for protecting Phase 2 negotiations. Select all algorithms that you want to allow, although you cannot include both mixed-mode (AES-GCM) and normal mode options in the same policy. (Normal mode requires that you select an integrity hash, whereas mixed-mode prohibits a separate integrity hash selection.) The

system negotiates with the peer, starting from the strongest to the weakest algorithm until a match is agreed upon. For an explanation of the options, see Deciding Which Encryption Algorithm to Use.

- **Diffie-Hellman Group**—The Diffie-Hellman group to use for deriving a shared secret between the two IPsec peers without transmitting it to each other. A larger modulus provides higher security but requires more processing time. The two peers must have a matching modulus group. Select all the algorithms that you want to allow. The system negotiates with the peer, starting from the strongest to the weakest group until a match is agreed upon. For an explanation of the options, see Deciding Which Diffie-Hellman Modulus Group to Use.
- **Integrity Hash**—The integrity portion of the hash algorithm for creating a message digest, which is used to ensure message integrity. Select all the algorithms that you want to allow. The system negotiates with the peer, starting from the strongest to the weakest algorithm until a match is agreed upon. The integrity hash is not used with the AES-GCM encryption options. For an explanation of the options, see Encryption and Hash Algorithms Used in VPN.
- **Pseudo-Random Function (PRF) Hash**—The pseudo-random function (PRF) portion of the hash algorithm, which is used as the algorithm to derive keying material and hashing operations required for the IKEv2 tunnel encryption. In IKEv1, the Integrity and PRF algorithms are not separated, but in IKEv2, you can specify different algorithms for these elements. Select all the algorithms that you want to allow. The system negotiates with the peer, starting from the strongest to the weakest algorithm until a match is agreed upon. For an explanation of the options, see Encryption and Hash Algorithms Used in VPN.
- **Lifetime**—The lifetime of the security association (SA), in seconds, from 120 to 2147483647 or blank. When the lifetime is exceeded, the SA expires and must be renegotiated between the two peers. As a general rule, the shorter the lifetime (up to a point), the more secure your IKE negotiations will be. However, with longer lifetimes, future IPsec security associations can be set up more quickly than with shorter lifetimes. The default is 86400. To specify an unlimited lifetime, enter no value (leave the field blank).

Step 5 Click **Add**.

RA VPN Objects

Security Zone Object

A security zone is a grouping of interfaces. Zones divide the network into segments to help you manage and classify traffic. You can define multiple zones, but a given interface can be in one zone only.

The Firepower system creates the following zones during initial configuration and they are displayed in Defense Orchestrator's object page. You can edit zones to add or remove interfaces, or you can delete the zones if you no longer use them.

- **inside_zone**-Includes the inside interface. This zone is intended to represent internal networks.
- **outside_zone**-Includes the outside interface. This zone is intended to represent networks external to your control, such as the internet.

Typically, you would group interfaces by the role they play in your network. For example, you would place the interface that connects to the internet in the **outside_zone** security zone, and all of the interfaces for your

internal networks in the **inside_zone** security zone. Then, you could apply access control rules to traffic coming from the outside zone and going to the inside zone.

Before creating zones, consider the access rules and other policies you want to apply to your networks. For example, you do not need to put all internal interfaces into the same zone. If you have 4 internal networks, and you want to treat one differently than the other three, you can create two zones rather than one. If you have an interface that should allow outside access to a public web server, you might want to use a separate zone for the interface.

Related Information:

- Create or Edit a Firepower Security Zone Object
- Assign a Firepower Interface to a Security Zone
- Deleting Objects

Create or Edit a Firepower Security Zone Object

A security zone is a grouping of interfaces. Zones divide the network into segments to help you manage and classify traffic. You can define multiple zones, but a given interface can be in one zone only. For more information see,Security Zone Object.

A security zone object is not associated with a device unless it is used in a rule for that device.

Create a Security Zone Object

To create a security zone object, follow these instructions:

Procedure

Step 1 In the CDO navigation bar on the left, click **Objects > FDM Objects**.

Step 2 Click the blue plus button  and select **FTD** > **Security Zone** to create the object.

Step 3 Give the object a name and, optionally, a description.

Step 4 Select the interfaces to put in the security zone.

Step 5 Click **Add.**

Edit a Security Zone Object

After onboarding an FDM-managed device, you will find there are already at least two security zones, one is the inside_zone and the other is the outside_zone. These zones can be edited or deleted. To edit any security zone object, follow these instructions:

Procedure

Step 1 In the CDO navigation bar on the left, click **Objects > FDM Objects**.

Step 2 Find the object you want to edit:

- If you know the name of the object, you can search for it in the Objects page:

- Filter the list by security zone.
- Enter the name of the object in the search field.
- Select the object.

- If you know the object is associated with a device, you can search for it starting on the **Inventory** page.
  - In the navigation pane, click **Inventory**.
  - Click the **Devices** tab.
  - Click the apporpriate tab.
  - Use the device Filters and Page Level Search bar to locate your device.
  - Select the device.
  - In the Management pane at the right, click  **Objects.**
  - Use the object filter and search bar to locate the object you are looking for.

Note If the security zone object you created is not associated with a rule in a policy for your device, it is considered "unassociated" and you will not see it among the search results for a device.

Step 3 Select the object.

Step 4 Click the **Edit** icon in the Actions pane at the right.

Step 5 After editing any of the attributes of the object. Click **Save**.

Step 6 After clicking Save you receive a message explaining how these changes will affect other devices. Click **Confirm** to save the changes or Cancel.

Service Objects

Firepower Service Objects

FTD service objects, service groups, and port groups are reusable components that contain protocols or ports considered part of the IP protocol suite.

FTD service groups are collections of service objects. A service group may contain objects for one or more protocols. You can use the objects and groups in security policies for purposes of defining network traffic matching criteria, for example, to use access rules to allow traffic to specific TCP ports. The system includes several pre-defined objects for common services. You can use these objects in your policies; however, you cannot edit or delete system-defined objects.

Firepower Device Manager and Firepower Management Center refer to service objects as port objects and service groups and port groups.

See Create and Edit Firepower Service Objects for more information.

Protocol Objects

Protocol objects are a type of service object that contain less-commonly used or legacy protocols. Protocol objects are identified by a name and protocol number. CDO recognizes these objects in ASA and Firepower (FDM-managed device) configurations and gives them their own filter of "Protocols" so you can find them easily.

See Create and Edit Firepower Service Objects for more information.

ICMP Objects

An Internet Control Message Protocol (ICMP) object is a service object specifically for ICMP and IPv6-ICMP messages. CDO recognizes these objects in ASA and Firepower configurations when those devices are onboarded and CDO gives them their own filter of "ICMP" so you can find the objects easily.

Using CDO, you can rename or remove ICMP objects from an ASA configuration. You can use CDO to create, update, and delete ICMP and ICMPv6 objects in a Firepower configuration.

Note For the ICMPv6 protocol, AWS does not support choosing specific arguments. Only rules that allow all ICMPv6 messages are supported.

See Create and Edit Firepower Service Objects for more information.

Related Information:

- Deleting Objects, on page 104

Create and Edit Firepower Service Objects

To create a firepower service object, follow these steps:

firewall device manager (FDM-managed) service objects are reusable components that specify a TCP/IP protocol and a port. The firewall device manager, On-Prem Firewall Management Center and Cloud-delivered Firewall Management Center refer to these objects as "Port Objects."

Procedure

Step 1 In the CDO navigation bar on the left, click **Objects** > **FDM Objects**.

Step 2 Click the blue button  on the right to create an object, and select **FTD** > **Service**.

Step 3 Enter an object name and description.

Step 4 Select **Create a service object.**

Step 5 Click the **Service Type** button and select the protocol for which you want to create an object.

Step 6 Configure the protocol as follows:

- **TCP**, **UDP**
  - Select **eq** and then enter either a port number or a protocol name. For example, you could enter 80 as a port number or HTTP as the protocol name.

- You can also select **range** and then enter a range of port numbers, for example, **1 65535** (to cover all ports).

- **ICMP**, **IPv6-ICMP**-Select the ICMP **Type.** Select **Any** for the type to apply to all ICMP messages. For information on the types and codes, see the following pages:
  - ICMP-http://www.iana.org/assignments/icmp-parameters/icmp-parameters.xml
  - ICMPv6-http://www.iana.org/assignments/icmpv6-parameters/icmpv6-parameters.xml
- **Other**-Select the desired protocol.

Step 7 Click **Add**.

Step 8 Review and deploy the changes you made now, or wait and deploy multiple changes at once.

Create a Firepower Service Group

A service group can be made up of one or more service objects representing one or more protocols. The service objects need to be created before they can be added to the group. The Firepower Device Manager and Firepower Management Center refer to these objects as "Port Objects."

Procedure

Step 1 In the CDO navigation bar on the left, click **Objects > FDM Objects**.

Step 2 Click the blue button  on the right to create an object, and select **FTD > Service**.

Step 3 Enter an object name and description.

Step 4 Select **Create a service group.**

Step 5 Add an object to the group by clicking **Add Object.**

- Click **Create** to create a new object as you did above in Create and Edit Firepower Service Objects above.
- Click **Choose** to add an existing service object to the group. Repeat this step to add more objects.

Step 6 Click **Add** when you are done adding service objects to the service group.

Step 7 Review and deploy the changes you made now, or wait and deploy multiple changes at once.

Edit a Firepower Service Object or Service Group

Procedure

Step 1 In the CDO navigation bar on the left, click **Objects > FDM Objects**.

Step 2 Filter the objects to find the object you want to edit and then select the object in the object table.

Step 3 In the Actions pane, click **Edit**  .

Step 4 Edit the values in the dialog box in the same fashion that you created them in the procedures above.

Step 5 Click **Save**.

Step 6 CDO displays the policies that will be affected by the change. Click **Confirm** to finalize the change to the object and any policy affected by it.

Step 7 Review and deploy the changes you made now, or wait and deploy multiple changes at once.

Security Group Tag Group

Security Group Tags

About Security Group Tags

If you use Cisco Identity Services Engine (ISE) to define and use **security group tag** (SGT) for classifying traffic in a Cisco TrustSec network, you can write access control rules that use SGT as matching criteria. Thus, you can block or allow access based on security group membership rather than IP addresses.

In ISE, you can create a SGT and assign host or network IP addresses to each tag. If you assign an SGT to a user's account, the SGT is assigned to the user's traffic. After you configure FDM-managed device to connect to an ISE server and create the SGT, you can create SGT groups in Cisco Defense Orchestrator and build access control rules around them. Note that you must configure ISE's SGT Exchange Protocol (SXP) mapping before you can associate an SGT to an FDM-managed device. See **Security Group Tag Exchange Protocol** in the Cisco Identity Services Engine Administrator Guide of the version you are currently running for more information.

When an FDM-managed device evaluates SGT as a traffic matching criteria for an access control rule, it uses the following priority:

1. The source SGT defined in the packet, if any. No destination matching is done using this technique. For the SGT to be in the packet, the switches and routers in the network must be configured to add them. See the ISE documentation for information on how to implement this method.
2. The SGT assigned to the user session, as downloaded from the ISE session directory. You need to enable the option to listen to session directory information for this kind of SGT matching, but this option is on by default when you first create the ISE identity source. The SGT can be matched to source or destination. Although not required, you would also normally set up a passive authentication identity rule, using the ISE identity source along with an AD realm, to collect user identity information.
3. The SGT-to-IP address mapping downloaded using SXP. If the IP address is within the range for an SGT, then the traffic matches the access control rule that uses the SGT. The SGT can be matched to source or destination.

Note You cannot use the information retrieved from ISE directly in an access control rule. Instead, you need to create SGT groups, which refer to the downloaded SGT information. Your SGT groups can refer to more than one SGT, so you can apply policy based on a relevant collections of tags if that is appropriate.

Version Support

CDO currently supports SGT and SGT groups on FDM-managed devices running Version 6.5 and later. an FDM-managed device allows you to configure and connect to an ISE server in Version 6.5 and later but not does not support SGT configuration in the UI until Version 6.7.

From the FDM-managed UI, this means that an FDM-managed device running Version 6.5 or later can download SXP mappings of SGTs but cannot be manually added to objects or access control rules. To make changes to the SGTs for devices running Version 6.5 or Version 6.6, you must use the ISE UI. If the device running Version 6.5 is onboarded to Cisco Defense Orchestrator, however, you can see the current SGTs associated with the device and create SGT groups.

SGT in CDO

Security Group Tags

SGTs are read-only in CDO. You cannot create or edit an SGT in CDO. To create an SGT, see the Cisco Identity Services Engine Administrator Guide of the version your are currently running.

SGT Groups

Note An FDM-managed device refers to groups of SGTs as SGT dynamic objects. In CDO, these lists of tags are currently called SGT groups. You can create an SGT group in CDO without referring to the FDM-managed device or ISE UI.

Use SGT groups to identify source or destination addresses based on an SGT assigned by ISE. You can then use the objects in access control rules for purposes of defining traffic matching criteria. You cannot use the information retrieved from ISE directly in an access control rule. Instead, you need to create SGT groups, which refer to the downloaded SGT information.

Your SGT groups can refer to more than one SGT, so you can apply policy based on relevant collections of tags if that is appropriate.

In order to create an SGT group in CDO, you must have at least one SGT already configured and SGT mappings from an ISE server configured for the FDM-managed console of the device you want to use. Note that if more than one FDM-managed device is associated with the same ISE server, an SGT or SGT group can be applied to more than one device. If a device is not associated with an ISE server, you cannot include SGT objects in your access control rule, or apply an SGT group to that device configuration.

SGT Groups in Rules

SGT groups can be added to access control rules; they appear as source or destination network objects. For more information about how networks work in rules, see Source and Destination Criteria in an FDM Access Control Rule.

You can create an SGT group from the Objects page. See Create an SGT Group, on page 141 for more information.

Create an SGT Group

To create an SGT group that can be used for an access control rule, use the following procedure:

Before you begin

You must have the following configurations or environments configured prior to creating a security group tag (SGT) group:

- FDM-managed device must be running at least Version 6.5.
- You must configure the ISE identity source to subscribe to SXP mappings and enable deploy changes. To manage SXP mappings, see **Configure Security Groups and SXP Publishing in ISE** of the Firepower Device Manager Configuration Guide for the version you're using, Version 6.7 and later.
- All SGTs must be created in ISE. To create an SGT, see the Cisco Identity Services Engine Configuration Guide of the version your are currently running.

Procedure

Step 1 In the CDO navigation bar on the left, click **Objects > FDM Objects**.

Step 2 Click the blue plus button  to create an object.

Step 3 Click **FTD > Network**.

Step 4 Enter an **Object Name**.

Step 5 (Optional) Add a description.

Step 6 Click **SGT** and use the drop-down menu to check all the applicable SGTs you want included in the group. You can sort the list by SGT name.

Step 7 Click **Save**.

Note You cannot create or edit SGTs in CDO, you can only add or remove them from an SGT group. To create or edit an SGT, see the Cisco Identity Services Engine Configuration Guide of the version you are currently running.

Edit an SGT Group

To edit an SGT group, use the following procedure:

Procedure

Step 1 In the CDO navigation bar on the left, click **Objects > FDM Objects**.

Step 2 Locate the SGT group you want to edit by using object filters and search field.

Step 3 Select the SGT group and click the edit icon  in the **Actions** pane.

Step 4 Modify the SGT group. Edit the name, description, or the SGTs associated with the group.

Step 5 Click **Save**.

Note You cannot create or edit SGTs in CDO, you can only add or remove them from an SGT group. To create or edit an SGT, see the Cisco Identity Services Engine Configuration Guide of the version you are currently running.

Add an SGT Group to an Access Control Rule

To add an SGT group to an access control rule, use the following procedure:

Procedure

Step 1 In the navigation pane, click **Inventory**.

Step 2 Click the **Devices** tab to locate the device or the **Templates** tab to locate the model device.

Step 3 Click the **FTD** tab and select the device you want to add the SGT group to.

Step 4 In the**Management** pane, select **Policy**.

Step 5 Click the blue plus button for either the **Source** or **Destination** objects and select **SGT Groups**.

Step 6 Locate the SGT group(s) you want to edit by using object filters and search field.

Step 7 Click **Save**.

Step 8 Preview and Deploy Configuration Changes for All Devices.

Note If you need to create an additional SGT group, click **Create New Object**. Fill in the required information mentioned in Create an SGT Group and **Add** the SGT group to the rule.

Syslog Server Objects

FDM-managed devices have a limited capacity to store events. To maximize storage for events, you can configure an external server. A system log (syslog) server object identifies a server that can receive connection-oriented or diagnostic syslog messages. If you have a syslog server set up for log collection and analysis, you can use the Cisco Defense Orchestrator to create objects to define them and use the objects in the related policies.

Create and Edit Syslog Server Objects

To create a new syslog server object, follow these steps:

Procedure

Step 1 In the CDO navigation bar on the left, click **Objects > FDM Objects**.

Step 2 Click the **Create Object** button .

Step 3 Select **Syslog Server** under FDM-managed device object types

Step 4 Configure the syslog server object properties:

- **IP Address**—Enter the IP address of the syslog server.
- **Protocol Type**—Select the protocol that your syslog server uses to receive messages. If you select TCP, the system can recognize when the syslog server is not available, and stops sending events until the server is available again.
- **Port Number**—Enter a valid port number to use for syslog. If your syslog server uses default ports, enter 514 as the default UDP port or 1470 as the default TCP port. If the server does not use default ports, enter the correct port number. The port must be in the range 1025 to 65535.
- **Select an interface**—Select which interface should be used for sending diagnostic syslog messages. Connection and intrusion events always use the management interface. Your interface selection determines the IP address associated with syslog messages. Note that you can only select **one** of the options listed below. You cannot select both. Select one of the following options:
  - **Data Interface**—Use the data interface you select for diagnostic syslog messages. Select an interface from the generated list. If the server is accessible through a bridge group member interface, select the bridge group interface (BVI). If it is accessible through the Diagnostic interface (the physical management interface), we recommend that you select Management Interface instead of this option. You cannot select a passive interface. For connection and intrusion syslog messages, the source IP address will either be for the management interface, or for the gateway interface if you route through data interfaces.
  - **Management Interface**—Use the virtual management interface for all types of syslog messages. The source IP address will either be for the management interface, or for the gateway interface if you route through data interfaces.

Step 5 Click **Add**.

Step 6 Review and deploy now the changes you made, or wait and deploy multiple changes at once.

Edit Syslog Server Objects

To edit an existing syslog server object, follow these steps:

Procedure

Step 1 In the CDO navigation bar on the left, click **Objects > FDM Objects**.

Step 2 Locate the desired syslog server object and select it. You can **filter** the object list by the syslog server object type.

Step 3 In the Actions pane, click **Edit**.

Step 4 Make the desired edits and click **Save**.

Step 5 Confirm the changes you made.

Step 6 Review and deploy now the changes you made, or wait and deploy multiple changes at once.

Related Information:

- Deleting Objects

Create a Syslog Server Object for Secure Logging Analytics (SaaS)

Create a syslog server object with the IP address, TCP port, or UDP port of the Secure Event Connector (SEC) you want to send events to. You would create one syslog object for every SEC that you have onboarded to your tenant but you would only send events from one rule to one syslog object representing one SEC.

Prerequisite

This task is part of a larger workflow. See Implementing Secure Logging Analytics (SaaS) for FDM-Managed Devices before you begin.

Procedure

Procedure

Step 1 In the CDO navigation bar on the left, click **Objects > FDM Objects**.

Step 2 Click the **Create Object** button  .

Step 3 Select **Syslog Server** under FDM-managed device object types.

Step 4 Configure the syslog server object properties. To find these properties of the SEC, from the navigation pane on the left, choose **Tools & Services** > **Secure Connectors**. Then select the Secure Event Connector you want to configure the syslog object for and look in the Details pane on the right.

- **IP Address**—Enter the IP address of the SEC.
- **Protocol Type**—Select TCP or UDP.
- **Port Number**—Enter port 10125 if you selected TCP or 10025 if you selected UDP.
- **Select an interface**—Select the interface configured to reach the SEC.

Note FDM-managed device supports one syslog object per IP address so you will have to choose between using TCP and UDP.

Step 5 Click **Add**.

What to do next

Continue with Step 3 of Existing CDO Customer Workflow to Implement Secure Logging Analytics (SaaS) and Send Events through the Secure Event Connector to the Cisco Cloud.

Procedure