



Configure the Cisco Secure Dynamic Attributes Connector

Install the dynamic attributes connector and configure connectors, dynamic attributes filters, and adapters to provide management center with dynamic network data that can be used in access control rules.

See the following topics for more information:

- [Create a Connector, on page 1](#)
- [Create an Adapter, on page 14](#)
- [Create Dynamic Attributes Filters, on page 23](#)

Create a Connector

A *connector* is an interface with a cloud service. The connector retrieves network information from the cloud service so the network information can be used in access control policies on the management center.

We support the following:

Table 1: List of supported connectors by Cisco Secure Dynamic Attributes Connector version and platform

CSDAC version/platform	AWS	GitHub	Google Cloud	Azure	Azure Service Tags	Microsoft Office 365	vCenter	Webex	Zoom
Version 1.1 (on-premises)	Yes	No	No	Yes	Yes	Yes	Yes	No	No
Version 2.0 (on-premises)	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No

See one of the following sections for more information.

Amazon Web Services Connector—About User Permissions and Imported Data

The Cisco Secure Dynamic Attributes Connector imports dynamic attributes from AWS to the management center for use in access control policies.

Dynamic attributes imported

We import the following dynamic attributes from AWS:

- *Tags*, user-defined key-value pairs you can use to organize your AWS EC2 resources.
For more information, see [Tag your EC2 Resources](#) in the AWS documentation
- *IP addresses* of virtual machines in AWS.

Minimum permissions required

The Cisco Secure Dynamic Attributes Connector requires a user at minimum with a policy that permits `ec2:DescribeTags` and `ec2:DescribeInstances` to be able to import dynamic attributes.

Create an AWS User with Minimal Permissions for the Cisco Secure Dynamic Attributes Connector

This task discusses how to set up a service account with minimum permissions to send dynamic attributes to the management center. For a list of these attributes, see [Amazon Web Services Connector—About User Permissions and Imported Data, on page 2](#).

Before you begin

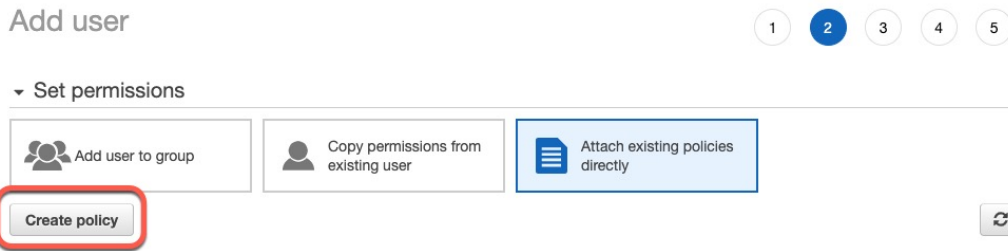
You must already have set up your Amazon Web Services (AWS) account. For more information about doing that, see [this article](#) in the AWS documentation.

-
- Step 1** Log in to the AWS console as a user with the admin role.
 - Step 2** From the Dashboard, click **Security, Identity & Compliance > IAM**.
 - Step 3** Click **Access Management > Users**.
 - Step 4** Click **Add Users**.
 - Step 5** In the **User Name** field, enter a name to identify the user.
 - Step 6** Click **Access Key - Programmatic Access**.
 - Step 7** At the Set permissions page, click **Next** without granting the user access to anything; you'll do this later.
 - Step 8** Add tags to the user if desired.
 - Step 9** Click **Create User**.
 - Step 10** Click **Download .csv** to download the user's key to your computer.

Note This is the only opportunity you have to retrieve the user's key.

- Step 11** Click **Close**.
- Step 12** At the Identity and Access Management (IAM) page in the left column, click **Access Management > Policies**.
- Step 13** Click **Create Policy**.

Step 14 On the Create Policy page, click **JSON**.



Step 15 Enter the following policy in the field:

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Effect": "Allow",
      "Action": [
        "ec2:DescribeTags",
        "ec2:DescribeInstances"
      ],
      "Resource": "*"
    }
  ]
}
```

Step 16 Click **Next**.

Step 17 Click **Review**.

Step 18 On the Review Policy page, enter the requested information and click **Create Policy**.

Step 19 On the Policies page, enter all or part of the policy name in the search field and press Enter.

Step 20 Click the policy you just created.

Step 21 Click **Actions > Attach**.

Step 22 If necessary, enter all or part of the user name in the search field and press Enter.

Step 23 Click **Attach Policy**.

What to do next

[Create an AWS Connector, on page 3.](#)

Create an AWS Connector

This task discusses how to configure a connector that sends data from AWS to the management center for use in access control policies.

Before you begin

Create a user with at least the privileges discussed in [Create an AWS User with Minimal Permissions for the Cisco Secure Dynamic Attributes Connector, on page 2.](#)

Step 1 Log in to the dynamic attributes connector.

Step 2 Click **Connectors**.

Step 3 Do any of the following:

- Add a new connector: click Add icon (+), then click the name of the connector.
- Edit or delete a connector: Click **More** (⋮), then click **Edit** or **Delete** at the end of the row.

Step 4 Enter the following information.

Value	Description
Name	(Required.) Enter a name to uniquely identify this connector.
Description	Optional description.
Pull Interval	(Default 30 seconds.) Interval at which IP mappings are retrieved from AWS.
Region	(Required.) Enter your AWS region code.
Access Key	(Required.) Enter your access key.
Secret Key	(Required.) Enter your secret key.

Step 5 Click **Test** and make sure the test succeeds before you save the connector.

Step 6 Click **Save**.

Step 7 Make sure **Ok** is displayed in the Status column.

What to do next

[Create an Adapter, on page 14](#)

Azure Connector—About User Permissions and Imported Data

The Cisco Secure Dynamic Attributes Connector imports dynamic attributes from Azure to the management center for use in access control policies.

Dynamic attributes imported

We import the following dynamic attributes from Azure:

- *Tags*, key-value pairs associated with resources, resource groups, and subscriptions.
For more information, see [this page](#) in the Microsoft documentation.
- *IP addresses* of virtual machines in Azure.

Minimum permissions required

The Cisco Secure Dynamic Attributes Connector requires a user at minimum with the **Reader** permission to be able to import dynamic attributes.

Create an Azure User with Minimal Permissions for the Cisco Secure Dynamic Attributes Connector

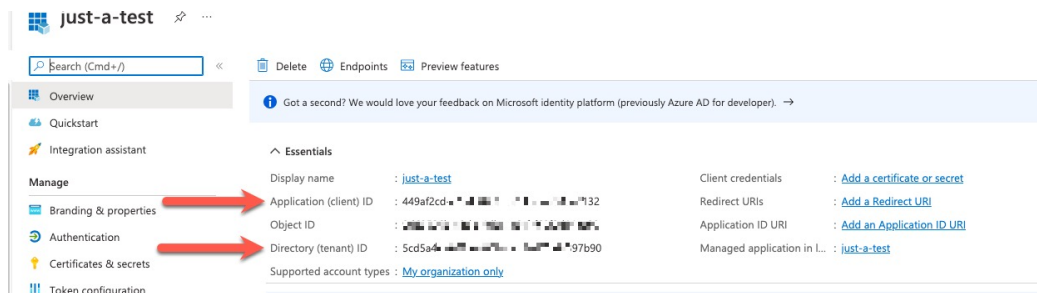
This task discusses how to set up a service account with minimum permissions to send dynamic attributes to the management center. For a list of these attributes, see [Azure Connector—About User Permissions and Imported Data, on page 4](#).

Before you begin

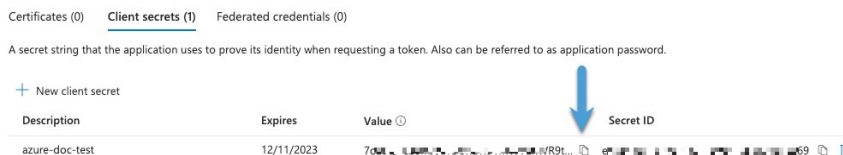
You must already have a Microsoft Azure account. To set one up, see [this page](#) on the Azure documentation site.

- Step 1** Log in to the [Azure Portal](#) as the owner of the subscription.
- Step 2** Click **Azure Active Directory**.
- Step 3** Find the instance of Azure Active Directory for the application you want to set up.
- Step 4** Click **Add > App registration**.
- Step 5** In the **Name** field, enter a name to identify this application.
- Step 6** Enter other information on this page as required by your organization.
- Step 7** Click **Register**.
- Step 8** On the next page, make note of the Client ID (also referred to as *application ID*) and the tenant ID (also referred to as the *directory ID*).

A sample follows.



- Step 9** Next to Client Credentials, click **Add a certificate or secret**.
- Step 10** Click **New Client Secret**.
- Step 11** Enter the requested information and click **Add**.
- Step 12** Copy the value of the **Value** field to the clipboard. This value, *and not the Secret ID*, is the client secret.



- Step 13** Go back to the main Azure Portal page and click **Subscriptions**.
- Step 14** Click the name of your subscription.
- Step 15** Copy the subscription ID to the clipboard.

Create an Azure User with Minimal Permissions for the Cisco Secure Dynamic Attributes Connector

Essentials

Subscription ID	: 01249b [redacted] 0cd	Subscription name	: Microsoft Azure Enterprise
Directory	: cisco-fpiden [redacted]	Current billing period	: 6/1/2023-6/30/2023
My role	: Owner	Currency	: USD
Offer	: Enterprise Agreement	Status	: Active
Offer ID	: MS [redacted]	Secure Score	: Not available
Parent management group	: Scd5 [redacted]		

Copy to clipboard

Step 16 Click **Access Control (IAM)**.

Step 17 Click **Add > Add role assignment**.

Step 18 Click **Reader** and click **Next**.

Step 19 Click **Select Members**.

Step 20 On the right side of the page, click the name of the app you registered and click **Select**.

> [Microsoft Azure Enterprise](#) >

Add role assignment

Got feedback?

Role **Members** Review + assign

Selected role
Reader

Assign access to

User, group, or service principal
 Managed identity

Members
[+ Select members](#)

Name	Object ID
No members selected	

Description
Optional


Review + assign Previous Next

Select members ×

Select

No users, groups, or service principals found.

Selected members:

 just-a-test [Remove](#)

Select Close

Step 21 Click **Review + Assign** and follow the prompts to complete the action.

What to do next

See [Create an Azure Connector](#), on page 7.

Create an Azure Connector

This task discusses how to create a connector to send data from Azure to management center for use in access control policies.

Before you begin

Create an Azure user with at least the privileges discussed in [Create an Azure User with Minimal Permissions for the Cisco Secure Dynamic Attributes Connector](#), on page 5.

Step 1 Log in to the dynamic attributes connector.

Step 2 Click **Connectors**.

Step 3 Do any of the following:

- Add a new connector: click Add icon (+), then click the name of the connector.
- Edit or delete a connector: Click **More** (⋮), then click **Edit** or **Delete** at the end of the row.

Step 4 Enter the following information.

Value	Description
Name	(Required.) Enter a name to uniquely identify this connector.
Description	Optional description.
Pull Interval	(Default 30 seconds.) Interval at which IP mappings are retrieved from Azure.
Subscription Id	(Required.) Enter your Azure subscription ID.
Tenant Id	(Required.) Enter your tenant ID.
Client Id	(Required.) Enter your client ID.
Client Secret	(Required.) Enter your client secret.

Step 5 Click **Test** and make sure **Test connection succeeded** is displayed before you save the connector.

Step 6 Click **Save**.

Step 7 Make sure **Ok** is displayed in the Status column.

What to do next

[Create an Adapter](#), on page 14

Create an Azure Service Tags Connector

This topic discusses how to create a connector for Azure service tags to the management center for use in access control policies. The IP addresses association with these tags are updated every week by Microsoft.

For more information, see [Virtual network service tags on Microsoft TechNet](#).

Step 1 Log in to the dynamic attributes connector.

Step 2 Click **Connectors**.

Step 3 Do any of the following:

- Add a new connector: click Add icon (+), then click the name of the connector.
- Edit or delete a connector: Click **More** (⋮), then click **Edit** or **Delete** at the end of the row.

Step 4 Enter the following information.

Value	Description
Name	(Required.) Enter a name to uniquely identify this connector.
Description	Optional description.
Pull Interval	(Default 30 seconds.) Interval at which IP mappings are retrieved from Azure.
Subscription Id	(Required.) Enter your Azure subscription ID.
Tenant Id	(Required.) Enter your tenant ID.
Client Id	(Required.) Enter your client ID.
Client Secret	(Required.) Enter your client secret.

Step 5 Click **Test** and make sure **Test connection succeeded** is displayed before you save the connector.

Step 6 Click **Save**.

Step 7 Make sure **Ok** is displayed in the Status column.

What to do next

[Create an Adapter, on page 14](#)

Google Cloud Connector—About User Permissions and Imported Data

The Cisco Secure Dynamic Attributes Connector imports dynamic attributes from Google Cloud to the management center for use in access control policies.

Dynamic attributes imported

We import the following dynamic attributes from Google Cloud:

- *Labels*, key-value pairs you can use to organize your Google Cloud resources.
For more information, see [Creating and Managing Labels](#) in the Google Cloud documentation.
- *Network tags*, key-value pairs associated with an organization, folder, or project.

For more information, see [Creating and Managing Tags](#) in the Google Cloud documentation.

- *IP addresses* of virtual machines in Google Cloud.

Minimum permissions required

The Cisco Secure Dynamic Attributes Connector requires a user at minimum with the **Basic > Viewer** permission to be able to import dynamic attributes.

Create a Google Cloud User with Minimal Permissions for the Cisco Secure Dynamic Attributes Connector

This task discusses how to set up a service account with minimum permissions to send dynamic attributes to the management center. For a list of these attributes, see [Google Cloud Connector—About User Permissions and Imported Data, on page 8](#).

Before you begin

You must already have set up your Google Cloud account. For more information about doing that, see [Setting Up Your Environment](#) in the Google Cloud documentation.

Step 1 Log in to your Google Cloud account as a user with the owner role.

Step 2 Click **IAM & Admin > Service Accounts > Create Service Account**.

Step 3 Enter the following information:

- **Service account name:** A name to identify this account; for example, **CSDAC**.
- **Service account ID:** Should be populated with a unique value after you enter the service account name.
- **Service account description:** Enter an optional description.

For more information about service accounts, see [Understanding Service Accounts](#) in the Google Cloud documentation.

Step 4 Click **Create and Continue**.

Step 5 Follow the prompts on your screen until the Grant users access to this service account section is displayed.

Step 6 Grant the user the **Basic > Viewer** role.

Step 7 Click **Done**.

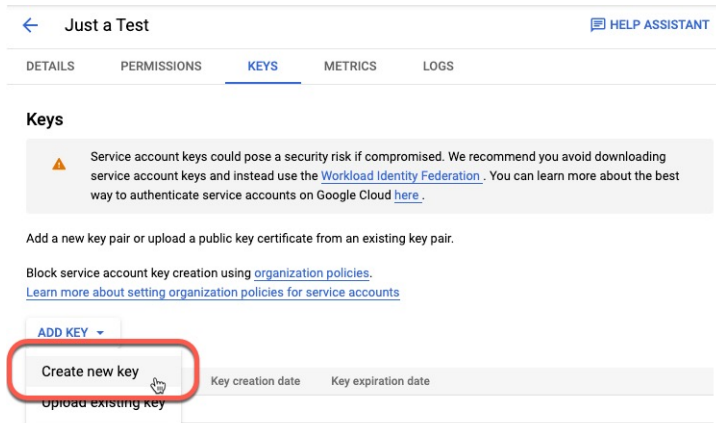
A list of service accounts is displayed.

Step 8 Click **More** (⋮) at the end of the row of the service account you created.

Step 9 Click **Manage Keys**.

Step 10 Click **Add Key > Create New Key**.

Create a Google Cloud Connector



Step 11 Click **JSON**.

Step 12 Click **Create**.

The JSON key is downloaded to your computer.

Step 13 Keep the key handy when you configure the GCP connector.

What to do next

See [Create a Google Cloud Connector, on page 10](#).

Create a Google Cloud Connector

Before you begin

Have your Google Cloud JSON-formatted service account data ready; it's required to set up the connector.

Step 1 Log in to the dynamic attributes connector.

Step 2 Click **Connectors**.

Step 3 Do any of the following:

- Add a new connector: click Add icon (+), then click the name of the connector.
- Edit or delete a connector: Click **More** (⋮), then click **Edit** or **Delete** at the end of the row.

Step 4 Enter the following information.

Value	Description
Name	(Required.) Enter a name to uniquely identify this connector.
Description	Optional description.
Pull Interval	(Default 30 seconds.) Interval at which IP mappings are retrieved from AWS.

Value	Description
GCP region	(Required.) Enter the GCP region in which your Google Cloud is located. For more information, see Regions and Zones in the Google Cloud documentation.
Service account	Paste the JSON code for your Google Cloud service account.

Step 5 Click **Test** and make sure the test succeeds before you save the connector.

Step 6 Click **Save**.

Step 7 Make sure **Ok** is displayed in the Status column.

What to do next

[Create an Adapter, on page 14](#)

Create an Office 365 Connector

This task discusses how to create a connector for Office 365 tags to send data to the management center for use in access control policies. The IP addresses associated with these tags are updated every week by Microsoft. You do not have to create a dynamic attributes filter to use the data.

For more information, see [Office 365 URLs and IP address ranges](#) on docs.microsoft.com.

Step 1 Log in to the dynamic attributes connector.

Step 2 Click **Connectors**.

Step 3 Do any of the following:

- Add a new connector: click Add icon (+), then click the name of the connector.
- Edit or delete a connector: Click **More** (⋮), then click **Edit** or **Delete** at the end of the row.

Step 4 Enter the following information.

Value	Description
Name	(Required.) Enter a name to uniquely identify this connector.
Description	Optional description.
Pull Interval	(Default 30 seconds.) Interval at which IP mappings are retrieved from Azure.
Base API URL	(Required.) Enter the URL from which to retrieve Office 365 information, if it's different from the default. For more information, see Office 365 IP Address and URL web service on the Microsoft documentation site.
Instance name	(Required.) From the list, click an instance name. For more information, see Office 365 IP Address and URL web service on the Microsoft documentation site.

Value	Description
Disable optional IPs	(Required.) Enter true or false .

Step 5 Click **Test** and make sure the test succeeds before you save the connector.

Step 6 Click **Save**.

Step 7 Make sure **Ok** is displayed in the Status column.

What to do next

[Create an Adapter, on page 14](#)

vCenter Connector—About User Permissions and Imported Data

The Cisco Secure Dynamic Attributes Connector imports dynamic attributes from vCenter to the management center for use in access control policies.

Dynamic attributes imported

We import the following dynamic attributes from vCenter:

- *Operating system*
- *MAC address*
- *IP addresses*
- *NSX tags*

Minimum permissions required

The Cisco Secure Dynamic Attributes Connector requires a user at minimum with the **Read Only** permission to be able to import dynamic attributes.

Create a vCenter Connector

This task discusses how to create a connector for VMware vCenter to send data to the management center for use in access control policies.

Before you begin

If you use non-trusted certificates to communicate with vCenter, see [Manually Get a Certificate Authority \(CA\) Chain, on page 20](#).

Step 1 Log in to the dynamic attributes connector.

Step 2 Click **Connectors**.

Step 3 Do any of the following:

- Add a new connector: click Add icon (+), then click the name of the connector.
- Edit or delete a connector: Click More (⋮), then click **Edit** or **Delete** at the end of the row.

Step 4 Enter the following information.

Value	Description
Name	(Required.) Enter a name to uniquely identify this connector.
Description	Enter an optional description.
Pull Interval	(Default 30 seconds.) Interval at which IP mappings are retrieved from vCenter.
Host	<p>(Required.) Enter any of the following:</p> <ul style="list-style-type: none"> • vCenter's fully qualified host name • vCenter's IP address • (Optional.) A port <p><i>Do not</i> enter a scheme (such as https://) or trailing slash. For example, myvcenter.example.com or 192.0.2.100:9090</p>
User	(Required.) Enter the user name of a user with the Read-only role at minimum. User names are case-sensitive.
Password	(Required.) Enter the user's password.
NSX IP	If you use vCenter Network Security Visualization (NSX), enter its IP address.
NSX User	Enter the user name of an NSX user with the Auditor role at minimum.
NSX Type	Enter NSX-T .
NSX Password	Enter the NSX user's password.
vCenter Certificate	<p>You have the following options:</p> <ul style="list-style-type: none"> • Click Fetch to automatically fetch the certificate or, if that is not possible, get the certificate manually as discussed in Manually Get a Certificate Authority (CA) Chain, on page 20.

Following is an example of successfully fetching a certificate chain:

Add FMC Adapter

Name* i Certificate chain was successfully fetched. Here are certificate details (priority order descending):
> firepower - 1 certificate

Descri > firepower - 1 certificate

Domain

IP* firepower

Port* 14733

User* rest

Password*

Secondary IP firepower

Secondary Port 14833

Secondary User

Secondary Password

FMC Server Certificate* Updated: 3IN CERTIFICATE-----

Expanding the certificate CA chain at the top of the dialog box displays the certificates similar to the following.

i Certificate chain was successfully fetched. Here are certificate details (priority order descending):
> firepower - 1 certificate

> firepower - 1 certificate

If it's not possible to fetch the certificate this way, you can get the certificate chain manually as discussed in [Manually Get a Certificate Authority \(CA\) Chain, on page 20](#).

Step 5 Click **Test** and make sure **Test connection succeeded** is displayed before you save the connector.

Step 6 Click **Save**.

What to do next

[Create an Adapter, on page 14](#)

Create an Adapter

An *adapter* is a secure connection to management center to which you push network information from cloud objects for use in access control policies.

First you can optionally fetch the certificate authority chain, which is required to securely connect to the management center.

Fetching the certificate authority chain requires only the management center host name; creating the adapter requires a user name, password, and other information.

Create a Secure Firewall Management Center User for the Dynamic Attributes Connector

We recommend you create a dedicated management center user for the dynamic attributes connector adapter. Creating a dedicated management center user avoids issues like unexpected logouts from the management center because the dynamic attributes connector periodically logs in using a REST API to update the management center with new and updated dynamic objects.

The management center user must have Access Admin privileges at least.

-
- Step 1** Log in to the management center if you haven't already done so.
- Step 2** Click **System** (⚙️) > **Users**.
- Step 3** Click **Create User**.
- Step 4** Enter the information required to create the user.
- Step 5** Under User Role Configuration, check any of the following default roles or a custom role with the same privilege level:
- **Administrator**
 - **Access Admin**
 - **Network Admin**

The following figure shows an example.

User Configuration

User Name	<input type="text" value="csdac-sample"/>	
Real Name	<input type="text" value="csdac-sample"/>	
Authentication	<input type="checkbox"/> Use External Authentication Method	
Password	<input type="password" value="....."/>	
Confirm Password	<input type="password" value="..... "/>	
Maximum Number of Failed Logins	<input type="text" value="5"/>	(0 = Unlimited)
Minimum Password Length	<input type="text" value="8"/>	
Days Until Password Expiration	<input type="text" value="0"/>	(0 = Unlimited)
Days Before Password Expiration Warning	<input type="text" value="0"/>	
Options	<input type="checkbox"/> Force Password Reset on Login <input type="checkbox"/> Check Password Strength <input type="checkbox"/> Exempt from Browser Session Timeout	

User Role Configuration

Default User Roles	<input type="checkbox"/> Administrator <input type="checkbox"/> External Database User (Read Only) <input type="checkbox"/> Security Analyst <input type="checkbox"/> Security Analyst (Read Only) <input type="checkbox"/> Security Approver <input type="checkbox"/> Intrusion Admin <input checked="" type="checkbox"/> Access Admin <input type="checkbox"/> Network Admin <input type="checkbox"/> Maintenance User <input type="checkbox"/> Discovery Admin <input type="checkbox"/> Threat Intelligence Director (TID) User
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You can also choose a custom role with sufficient privileges to allow REST actions or a different default role with sufficient privileges. For more information about default roles, see the User Roles section in the chapter on user accounts.

What to do next

[Create an Adapter, on page 14](#)

How to Create an On-Prem Firewall Management Center Adapter

This topic discusses how to create an adapter to push dynamic objects from the dynamic attributes connector to the management center.

Before you begin

See [Create a Secure Firewall Management Center User for the Dynamic Attributes Connector](#), on page 15.

Step 1 Log in to the dynamic attributes connector.

Step 2 Click **Adapters**.

Step 3 Do any of the following:

- Add a new connector: click Add icon (+), then click the name of the connector.
- Edit or delete a connector: Click **More** (⋮), then click **Edit** or **Delete** at the end of the row.

Step 4 Enter the following information.

Value	Description
Name	(Required.) Enter a unique name to identify this adapter.
Description	Optional description of the adapter.
Domain	Enter the Secure Firewall Management Center Virtual domain in which to create dynamic objects. Leave the field blank to create dynamic objects in the Global domain. For example, Global/MySubdomain
IP	(Required.) Enter your Secure Firewall Management Center Virtual's host name or IP address. The host name or IP you enter must exactly match the Common Name of the CA certificate used to securely connect to it.
Port	(Required.) Enter the TLS port used by your Secure Firewall Management Center Virtual.
User	(Required.) Enter the name of an Secure Firewall Management Center Virtual user with the Network Admin role at minimum.
Password	(Required.) Enter the user's password.
Secondary IP	(High availability only.) Enter the secondary Secure Firewall Management Center Virtuals host name or IP address. The host name or IP you enter must exactly match the Common Name of the CA certificate used to securely connect to it.
Secondary Port	(High availability only.) Enter the TLS port used by your secondary Secure Firewall Management Center Virtual.
Secondary User	(High availability only.) Enter the name of a secondary Secure Firewall Management Center Virtual user with the Network Admin role at minimum.
Secondary Password	(High availability only.) Enter the user's password.
Server Certificate	You have the following options: <ul style="list-style-type: none"> • Click Fetch to automatically fetch the certificate or, if that is not possible, get the certificate manually as discussed in Manually Get a Certificate Authority (CA) Chain, on page 20.

Following is an example of successfully fetching a certificate chain:

The screenshot shows the 'Add FMC Adapter' dialog box. At the top, a green notification box states: 'Certificate chain was successfully fetched. Here are certificate details (priority order descending):' followed by two expandable items, each labeled '> firepower - 1 certificate'. Below the notification, the form fields are: Name (empty), Description (empty), Domain (empty), IP* (firepower), Port* (14733), User* (rest), Password* (masked with dots), Secondary IP (firepower), Secondary Port (14833), Secondary User (empty), Secondary Password (empty), and FMC Server Certificate* (Updated: 3IN CERTIFICATE-----). At the bottom, there are 'Test', 'Cancel', and 'Save' buttons.

Expanding the certificate CA chain at the top of the dialog box displays the certificates similar to the following.

This is a close-up of the green notification box from the previous screenshot. It contains the same text: 'Certificate chain was successfully fetched. Here are certificate details (priority order descending):' followed by two expandable items, each labeled '> firepower - 1 certificate'.

If it's not possible to fetch the certificate this way, you can get the certificate chain manually as discussed in [Manually Get a Certificate Authority \(CA\) Chain, on page 20](#).

Step 5 Click **Test** and make sure the test succeeds before you save the adapter.

Step 6 Click **Save**.

Create a Cloud-delivered Firewall Management Center Adapter

This topic discusses how to create an adapter to push dynamic objects from the dynamic attributes connector to a managed management center on the Cisco Defense Orchestrator.

Before you can create a Cloud-delivered Firewall Management Center, get the following information first: [Get Your Base URL and API Token, on page 19](#).

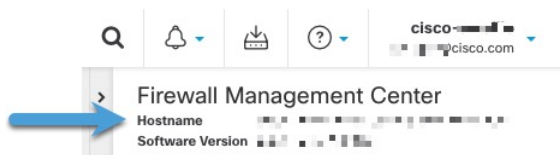
Get Your Base URL and API Token

This task discusses how to get the URL and API token from CDO that are required to create a Cloud-delivered Firewall Management Center adapter.

Before you begin

You must be a CDO Super Admin to complete the tasks discussed in this section.

-
- Step 1** Log in to CDO as a user with the Super Admin role.
- Step 2** In the upper right corner of the page, click **Settings**.
- Step 3** Click **General Settings**.
- Step 4** Next to API Token, click **Refresh**.
- Step 5** Copy the API token to a text file for later use.
- Step 6** Click **Tools & Services > Firewall Management Center**.
- Step 7** Click the name of the management center to which to send dynamic attributes connector data.
- Step 8** The value of **Hostname**, preceded by **https://**, is the base URL.
An example follows:



What to do next

[How to Create a Cloud-delivered Firewall Management Center Adapter, on page 19.](#)

How to Create a Cloud-delivered Firewall Management Center Adapter

This task discusses how to create a Cloud-delivered Firewall Management Center adapter that sends data from the dynamic attributes connector to a device managed by CDO.

Before you begin

You must get the management center base URL and API token from CDO before you can complete this task. For more information, see [Get Your Base URL and API Token, on page 19.](#)

-
- Step 1** Log in to the dynamic attributes connector.
- Step 2** Click **Adapters**.
- Step 3** Do any of the following:
- Add a new connector: click Add icon (+), then click the name of the connector.
 - Edit or delete a connector: Click **More** (⋮), then click **Edit** or **Delete** at the end of the row.

Step 4 Enter the following information.

Value	Description
Name	(Required.) Enter a unique name to identify this adapter.
Description	Optional description of the adapter.
Base Url	(Required.) Use the Base URL you found in Get Your Base URL and API Token, on page 19 .
API Token	(Required.) Use the API token you found in Get Your Base URL and API Token, on page 19 .

Step 5 Click **Test** and make sure the test succeeds before you save the adapter.

Step 6 Click **Save**.

What to do next

[Create Dynamic Attributes Filters, on page 23](#).

Manually Get a Certificate Authority (CA) Chain

In the event you cannot automatically fetch the certificate authority chain, use one of the following browser-specific procedures to get a certificate chain used to connect securely to vCenter, NSX, or the Management Center.

The *certificate chain* is the root certificate and all subordinate certificates.

You must use one of these procedures to connect to the following:

- vCenter or NSX

It is not necessary to get a certificate chain for connecting to Azure or AWS.

- Management Center

Before you use this procedure, see the section on automatically fetching the certificate authority chain in:

- [Create a vCenter Connector, on page 12](#)

Get a Certificate Chain—Mac (Chrome and Firefox)

Use this procedure to get a certificate chain using the Chrome and Firefox browsers on Mac OS.

1. Open a Terminal window.
2. Enter the following command.

```
security verify-cert -P url[:port]
```

where url is the URL (including scheme) to vCenter or Management Center. For example:

```
security verify-cert -P https://myvcenter.example.com
```

If you access vCenter or the management center using NAT or PAT, you can add a port as follows:

```
security verify-cert -P https://myvcenter.example.com:12345
```

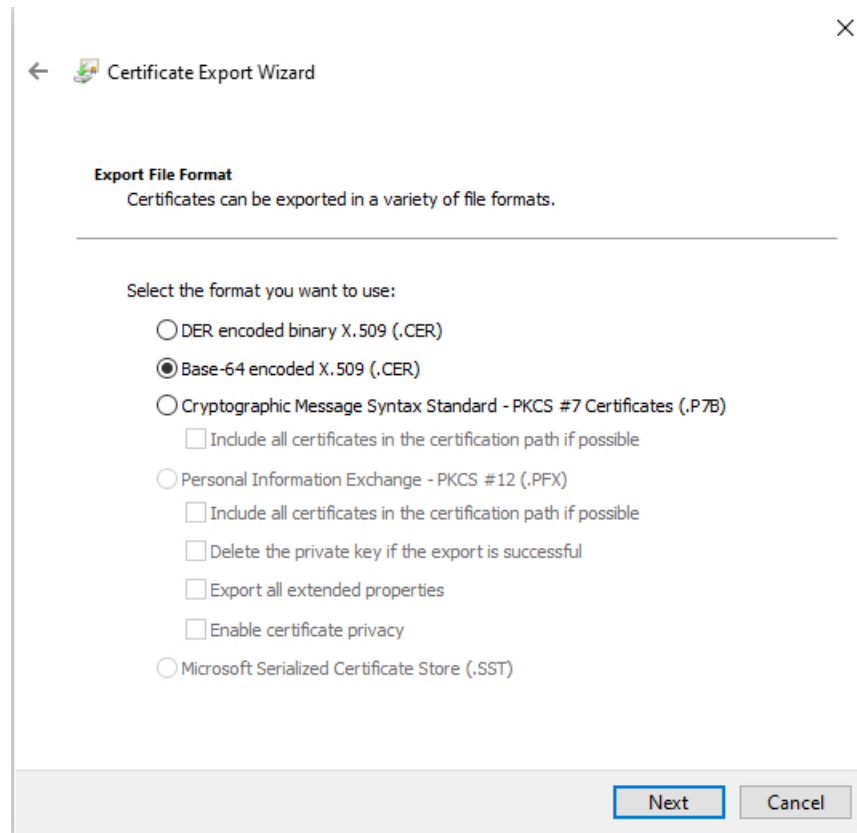
3. Save the entire certificate chain to a plaintext file.
 - *Include* all -----BEGIN CERTIFICATE----- and -----END CERTIFICATE----- delimiters.
 - *Exclude* any extraneous text (for example, the name of the certificate and any text contained in angle brackets (< and >) as well as the angle brackets themselves).
4. Repeat these tasks for both vCenter and the Management Center.

Get a Certificate Chain—Windows Chrome

Use this procedure to get a certificate chain using the Chrome browser on Windows.

1. Log in to vCenter or the Management Center using Chrome.
2. In the browser address bar, click the lock to the left of the host name.
3. Click **Certificate**.
4. Click the **Certification Path** tab.
5. Click the top (that is, first) certificate in the chain.
6. Click **View Certificate**.
7. Click the **Details** tab.
8. Click **Copy to File**.
9. Follow the prompts to create a CER-formatted certificate file that includes the entire certificate chain.

When you're prompted to choose an export file format, click **Base 64-Encoded X.509 (.CER)** as the following figure shows.

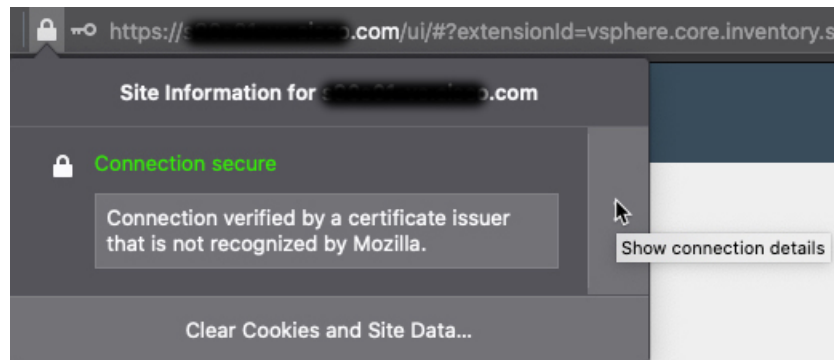


10. Follow the prompts to complete the export.
11. Open the certificate in a text editor.
12. Repeat the process for all certificates in the chain.
You must paste each certificate in the text editor in order, first to last.
13. Repeat these tasks for both vCenter and the FMC.

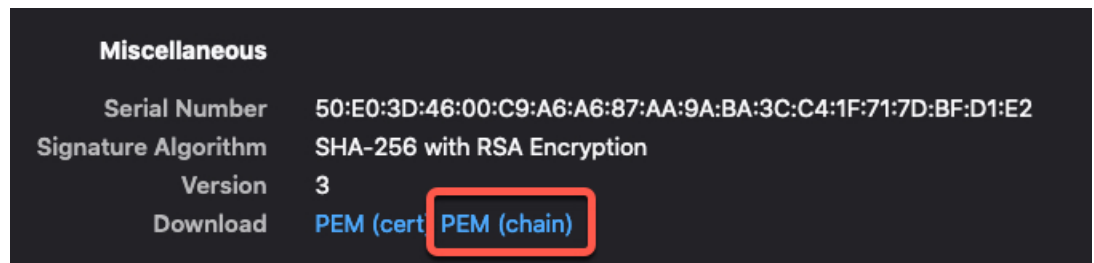
Get a Certificate Chain—Windows Firefox

Use the following procedure to get a certificate chain for the Firefox browser on either Windows or Mac OS.

1. Log in to vCenter or the Management Center using Firefox.
2. Click the lock to the left of the host name.
3. Click the right arrow (**Show connection details**). The following figure shows an example.



4. Click **More Information**.
5. Click **View Certificate**.
6. If the resulting dialog box has tab pages, click the tab page corresponding to the top-level CA.
7. Scroll to the Miscellaneous section.
8. Click **PEM (chain)** in the Download row. The following figure shows an example.



9. Save the file.
10. Repeat these tasks for both vCenter and the Management Center.

Create Dynamic Attributes Filters

Dynamic attributes filters that you define using the Cisco Secure Dynamic Attributes Connector are exposed in the management center as dynamic objects that can be used in access control policies. For example, you could restrict access to an AWS server for the Finance Department to only members of the Finance group defined in Microsoft Active Directory.



Note You cannot create dynamic attributes filters for Office 365, or Azure Service Tags. These types of cloud objects provide their own IP addresses.

For more information about access control rules, see [Create Access Control Rules Using Dynamic Attributes Filters](#).

Before you begin

Complete all of the following tasks:

- [Install Prerequisite Software](#)
- [Create a Connector, on page 1](#)
- [Create an Adapter, on page 14](#)

Step 1 Log in to the dynamic attributes connector.

Step 2 Click **Dynamic Attributes Filters**.

- Add a new connector: click Add icon (+), then click the name of the connector.
- Edit or delete a connector: Click **More** (⋮), then click **Edit** or **Delete** at the end of the row.

Step 3 Enter the following information.

Item	Description
Name	Unique name to identify the dynamic filter (as a dynamic object) in access control policy and in the management center Object Manager (External Attributes > Dynamic Object).
Connector	From the list, click the name of a connector to use.
Query	<ul style="list-style-type: none"> • Add a new filter: click Add icon (+). • Edit or delete a filter: Click More (⋮), then click Edit or Delete at the end of the row.

Step 4 To add or edit a query, enter the following information.

Item	Description
Key	Click a key from the list. Keys are fetched from the connector.
Operation	Click one of the following: <ul style="list-style-type: none"> • Equals to exactly match the key to the value. • Contains to match the key to the value if any part of the value matches.
Values	Click either Any or All and click one or more values from the list. Click Add another value to add values to your query.

Step 5 Click **Show Preview** to display a list of networks or IP addresses returned by your query.

Step 6 When you're finished, click **Save**.

- Step 7** (Optional.) Verify the dynamic object in the management center.
- Log in to the management center as a user with the Network Admin role at minimum.
 - Click **Objects > Object Management**.
 - In the left pane, click **External Attributes > Dynamic Object**.
The dynamic attribute query you created should be displayed as a dynamic object.

Dynamic Attribute Filter Examples

This topic provides some examples of setting up dynamic attribute filters.

Examples: vCenter

The following example shows one criterion: a VLAN.

Edit Dynamic Attribute Filter

Name* Connector*

Query*

Type	Op.	Value
<input type="button" value="all"/> network	eq	<input type="button" value="any"/> myVLAN

[> Show Preview](#)

The following example shows three criteria that are joined with OR: the query matches any of three hosts.

Add Dynamic Attribute Filter

Name* Connector*

Query*

Type	Op.	Value
<input type="button" value="all"/> host	eq	<input type="button" value="any"/> host-2868
		host-2869
		host-3780

[> Show Preview](#)

Example: Azure

The following example shows one criterion: a server tagged as a Finance app.

Add Dynamic Attribute Filter

Name* Connector*

Query*

Type	Op.	Value
<input type="button" value="all"/> Finance	eq	<input type="button" value="any"/> App

[> Show Preview](#)

Example: AWS

The following example shows one criterion: a FinanceApp with a value of 1.

Add Dynamic Attribute Filter

Name* Connector*

Query*

Type	Op.	Value
<input type="button" value="all"/> FinanceApp	eq	<input type="button" value="any"/> 1

[> Show Preview](#)