



Identity Policies

You can use identity policies to collect user identity information from connections. You can then view usage based on user identity in the dashboards, and configure access control based on user or user group.

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Identity Policy Overview

You can use identity policies to detect the user who is associated with a connection. By identifying the user, you can correlate threat, endpoint, and network intelligence with user identity information. By linking network behavior, traffic, and events directly to individual users, the system can help you identify the source of policy breaches, attacks, or network vulnerabilities.

For example, you can identify who owns the host targeted by an intrusion event, and who initiated an internal attack or port scan. You can also identify high bandwidth users and users who are accessing undesirable web sites or applications.

User detection goes beyond collecting data for analysis. You can also write access rules based on user name or user group name, selectively allowing or blocking access to resources based on user identity.

Establishing User Identity through Active Authentication

Authentication is the act of confirming the identity of a user.

With active authentication, when an HTTP traffic flow comes from an IP address for which the system has no user-identity mapping, you can decide whether to authenticate the user who initiated the traffic flow against the directory configured for the system. If the user successfully authenticates, the IP address is considered to have the identity of the authenticated user.

Failure to authenticate does not prevent network access for the user. Your access rules ultimately decide what access to provide these users.

Limitations on Number of Users

FDM can download information on up to 2000 users from the directory server.

If your directory server includes more than 2000 user accounts, you will not see all possible names when selecting users in an access rule or when viewing user-based dashboard information. You can write rules on only those names that were downloaded.

The limit also applies to the names associated with groups. If a group has more than 2000 members, only the 2000 names that were downloaded can be matched against the group membership.

If you have more than 2000 users, consider using the FMC (the remote manager) instead of FDM. FMC supports significantly more users.

Supported Directory Servers

You can use Microsoft Active Directory (AD) on Windows Server 2008 and 2012.

Note the following about your server configuration:

- If you want to perform user control on user groups or on users within groups, you must configure user groups on the directory server. The system cannot perform user group control if the server organizes the users in basic object hierarchy.
- The directory server must use the field names listed in the following table in order for the system to retrieve user metadata from the servers for that field.

Metadata	Active Directory Field
LDAP user name	samaccountname
first name	givenname
last name	sn
email address	mail userprincipalname (if mail has no value)
department	department distinguishedname (if department has no value)
telephone number	telephonenumber

Determining the Directory Base DN

When you configure directory properties, you need to specify the common base distinguished name (DN) for users and groups. The base is defined in your directory server, and differs from network to network. You must enter the correct bases for identity policies to work. If the base is wrong, the system cannot determine user or group names, and thus identity-based policies will be inoperable.



Tip To get the correct bases, consult the administrator who is responsible for the directory servers.

For active directory, you can determine the correct bases by logging into the Active Directory server as domain administrator, and using the **dsquery** command at a command prompt as follows to determine the bases:

User search base

Enter the **dsquery user** command with a known username (partial or complete) to determine the base distinguished name. For example, the following command uses the partial name “John*” to return information for all users that start with “John.”

```
C:\Users\Administrator>dsquery user -name "John*"
"CN=John Doe,CN=Users,DC=csc-lab,DC=example,DC=com"
```

The base DN would be “DC=csc-lab,DC=example,DC=com.”

Group search base

Enter the **dsquery group** command with a known group name to determine the base distinguished name. For example, the following command uses the group name Employees to return the distinguished name:

```
C:\>dsquery group -name "Employees"
"CN=Employees,CN=Users,DC=csc-lab,DC=example,DC=com"
```

The group base DN would be “DC=csc-lab,DC=example,DC=com.”

You can also use the ADSI Edit program to browse the Active Directory structure (**Start > Run > adsiedit.msc**). In ADSI Edit, right click any object, such as an organizational unit (OU), group, or user, and choose **Properties** to view the distinguished name. You can then copy the string of DC values as the base.

To verify that you have the correct base:

1. Click the Test Connection button in the directory properties to verify connectivity. Resolve any problems, and save the directory properties.
2. Commit changes to the device.
3. Create an access rule, select the **Users** tab, and try to add known user and group names from the directory. You should see auto-complete suggestions as you type for matching users and groups in the realm that contains the directory. If these suggestions appear in a drop-down list, then the system was able to query the directory successfully. If you see no suggestions, and you are certain the string you typed should appear in a user or group name, you need to correct the corresponding search base.

Dealing with Unknown Users

When you configure the directory server for the identity policy, the system downloads user and group membership information from the directory server. This information is refreshed every 24 hours at midnight, or whenever you edit and save the directory configuration (even if you do not make any changes).

If a user succeeds in authenticating when prompted by an active authentication identity rule, but the user's name is not in the downloaded user identity information, the user is marked as Unknown. You will not see the user's ID in identity-related dashboards, nor will the user match group rules.

However, any access control rules for the Unknown user will apply. For example, if you block connections for Unknown users, these users are blocked even though they succeeded in authenticating (meaning that the directory server recognizes the user and the password is valid).

Thus, when you make changes to the directory server, such as adding or deleting users, or changing group membership, these changes are not reflected in policy enforcement until the system downloads the updates from the directory.

If you do not want to wait until the daily midnight update, you can force an update by editing the directory server information (from **Policies > Identity**, click the **Directory Server** button). Click **Save**, then deploy changes. The system will immediately download the updates.



Note You can check whether new or deleted user information is on the system by going to **Policies > Access Control**, clicking the **Add Rule (+)** button, and looking at the list of users on the **Users** tab. If you cannot find a new user, or you can find a deleted user, then the system has old information.

Configuring Identity Policies

You can use identity policies to collect user identity information from connections. You can then view usage based on user identity in the dashboards, and configure access control based on user or user group.

The following is an overview of how to configure the elements required to obtain user identity through identity policies.

Procedure



Step 1 Select **Policies > Identity**.



If you have not yet defined an identity policy, you are prompted to start a wizard to configure it. Click **Get Started** to start the wizard. The wizard walks you through the following steps:

- a) [Configure Directory Server, on page 5](#)
- b) [Configure the Active Authentication Captive Portal, on page 6](#)

Step 2 Manage the identity policy.

After you configure identity settings, this page lists all rules in order. Rules are matched against traffic from top to bottom with the first match determining the action to apply. You can do the following from this page:

- To enable or disable the identity policy, click the **Identity Policy** toggle.
- To change the directory server configuration, click the **Directory Server** button (.
- To change the active authentication captive portal configuration, click the **Active Authentication** button (.
- To move a rule, edit it and select the new location from the **Order** drop-down list.
- To configure rules:
 - To create a new rule, click the + button.

- To edit an existing rule, click the edit icon () for the rule (in the Actions column). You can also selectively edit a rule property by clicking on the property in the table.
- To delete a rule you no longer need, click the delete icon () for the rule (in the Actions column).

For more information on creating and editing identity rules, see [Configure Identity Rules, on page 7](#).

Configure Directory Server

The directory server contains information about the users and user groups who are allowed access to your network. The system downloads updated information about all users and groups every day in the last hour of the day (UTC).

Work with your directory administrator to get the values required to configure the directory server properties.




Note

After you add the realm, you can verify your settings and test the connection by clicking the **Directory Server** button and then clicking the **Test** button in the Directory Server dialog box. If the test fails, verify all fields and ensure there is a network path between the management IP address and the directory server.

Procedure

Step 1 Select **Policies > Identity**.

Step 2 Do one of the following:

- If you have not configured the directory or identity rules yet, click **Get Started** to start the Identity Policy wizard. You are first prompted to configure the directory server.
- Click the **Directory Server** button (.

Step 3 Fill in the following information about your directory server:

- **Name**—A name for the directory realm.
- **Type**—The type of directory server. Active Directory is the only supported type, and you cannot change this field.
- **Directory Username, Directory Password**—The distinguished username and password for a user with appropriate rights to the user information you want to retrieve. For Active Directory, the user does not need elevated privileges. You can specify any user in the domain. The username must be fully qualified; for example, Administrator@example.com (not simply Administrator).
- **Base DN**—The directory tree for searching or querying user and group information, that is, the common parent for users and groups. For example, dc=example,dc=com. For information on finding the base DN, see [Determining the Directory Base DN, on page 2](#).
- **AD Primary Domain**—The fully qualified Active Directory domain name that the device should join. For example, example.com.

- **Hostname/IP Address**—The hostname or IP address of the directory server. If you use an encrypted connection to the server, you must enter the fully-qualified domain name, not the IP address.
- **Port**—The port number used for communications with the server. The default is 389. Use port 636 if you select LDAPS as the encryption method.
- **Encryption**—To use an encrypted connection for downloading user and group information, select the desired method, **STARTTLS** or **LDAPS**. The default is **None**, which means that user and group information is downloaded in clear text.
 - **STARTTLS** negotiates the encryption method, and uses the strongest method supported by the directory server. Use port 389.
 - **LDAPS** requires LDAP over SSL. Use port 636.
- **SSL Certificate**—If you select an encryption method, upload a CA certificate to enable a trusted connection between the system and the directory server. If you are using a certificate to authenticate, 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.

Step 4 Click **Next** (in the wizard) or **Save**.

Configure the Active Authentication Captive Portal

When an identity rule requires active authentication for a user, the user is redirected to the captive portal port on the interface through which they are connected and then they are prompted to authenticate. If you do not upload a certificate, users are presented with a self-signed certificate. Users will have to accept the certificate if you do not upload a certificate that their browsers already trust.



Note For the HTTP Basic, HTTP Response Page, and NTLM authentication methods, the user is redirected to the captive portal using the IP address of the interface. However, for HTTP Negotiate, the user is redirected using the fully-qualified DNS name *firewall-hostname.AD-domain-name*. If you want to use HTTP Negotiate, you must also update your DNS server to map this name to the IP addresses of all inside interfaces where you are requiring active authentication. Otherwise, the redirection cannot complete, and users cannot authenticate.


Before you begin

Ensure that time settings are consistent among the directory servers, Firepower Threat Defense device, and clients. A time shift among these devices can prevent successful user authentication. "Consistent" means that you can use different time zones, but the time should be the same relative to those zones; for example, 10 AM PST = 1 PM EST.

Procedure

Step 1 Select **Policies > Identity**.

Step 2 Do one of the following:

- If you are using the **Get Started** wizard, click **Next** after configuring the directory server.
- Click the **Active Authentication** button ()

Step 3 Configure the following options:

- **Server Certificate**—The CA certificate to present to users during active authentication. The certificate must be an X509 certificate in PEM or DER format. Paste in the certificate, or click **Upload Certificate** and select the certificate file. The default is to present a self-signed certificate during user authentication.
- **Certificate Key**—The key for the server certificate. Paste in the key, or click **Upload Key** and select the key file.
- **Port**—The captive portal port. The default is 885 (TCP). If you configure a different port, it must be in the range 1025-65535.

Step 4 Click **Save**.

Configure Identity Rules

Identity rules determine whether user identity information should be collected for matching traffic. You can configure No Authentication if you do not want to get user identity information for matching traffic.

Keep in mind that regardless of your rule configuration, active authentication is performed on HTTP traffic only. Thus, you do not need to create rules to exclude non-HTTP traffic from active authentication. You can simply apply an active authentication rule to all sources and destinations if you want to get user identity information for all HTTP traffic.



Note Also keep in mind that a failure to authentication has no impact on network access. Identity policies collect user identity information only. You must use access rules if you want to prevent users who failed to authenticate from accessing the network.


Before you begin


Rules are evaluated top-down. For a connection that matches the specified network criteria of a given rule, the user is evaluated against the identity realm specified in the rule. If the user is not part of that realm, they will be marked as unknown, and no further rules in the identity policy will be evaluated. Thus, if you have more than one realm that needs to be evaluated, be sure to use realm sequences instead of a single realm.

Procedure

Step 1 Select **Policies > Identity**.

Step 2 Do any of the following:

- To create a new rule, click the + button.
- To edit an existing rule, click the edit icon () for the rule.

To delete a rule you no longer need, click the delete icon () for the rule.

Step 3 In **Order**, select where you want to insert the rule in the ordered list of rules.

Rules are applied on a first-match basis, so you must ensure that rules with highly specific traffic matching criteria appear above policies that have more general criteria that would otherwise apply to the matching traffic.

The default is to add the rule to the end of the list. If you want to change a rule's location later, edit this option.

Step 4 Select the type of **User Authentication**.

You must select the AD identity realm that includes the user accounts for passive and active authentication rules.

- **Active**—Use active authentication to determine user identity. Active authentication is applied to HTTP traffic only. If any other type of traffic matches an identity policy that requires or allows active authentication, then active authentication will not be attempted.
- **No Auth**—Do not obtain user identity. Identity-based access rules will not be applied to this traffic. These users are marked as **No Authentication Required**.

Step 5 (Active Authentication only.) Select the authentication method (**Type**) supported by your directory server.

- **HTTP Basic**—Authenticate users using an unencrypted HTTP Basic Authentication (BA) connection. Users log in to the network using their browser's default authentication popup window. This is the default.
- **NTLM**—Authenticate users using an NT LAN Manager (NTLM) connection. This selection is only available when you select an AD realm. Users log in to the network using their browser's default authentication popup window, although you can configure IE and Firefox browsers to transparently authenticate using their Windows domain login (see [Enabling Transparent User Authentication, on page 10](#)).
- **HTTP Negotiate**—Allow the device to negotiate the method between the user agent (the application the user is using to initiate the traffic flow) and the Active Directory server. Negotiation results in the strongest commonly supported method being used, in order, NTLM, then basic. Users log in to the network using their browser's default authentication popup window.
- **HTTP Response Page**—Prompt users to authenticate using a system-provided web page. This is a form of HTTP Basic authentication.

Note

For the HTTP Basic, HTTP Response Page, and NTLM authentication methods, the user is redirected to the captive portal using the IP address of the interface. However, for HTTP Negotiate, the user is redirected using the fully-qualified DNS name *firewall-hostname.AD-domain-name*. If you want to use HTTP Negotiate, you must also update your DNS server to map this name to the IP addresses of all inside interfaces where you are requiring active authentication. Otherwise, the redirection cannot complete, and users cannot authenticate.

Step 6 (Active authentication only.) Select **Fall Back as Guest > On/Off** to determine whether users who fail active authentication are labeled as Guest users.

Users get 3 chances to successfully authenticate. If they fail, your selection for this option determines how the user is marked. You can write access rules based on these values.

- **Fall Back as Guest > On**—Users are marked as **Guest**.
- **Fall Back as Guest > Off**—Users are marked as **Failed Authentication**.

Step 7 Define the traffic matching criteria on the **Source/Destination** tab.

Keep in mind that active authentication will be attempted with HTTP traffic only. Therefore, there is no need to configure No Auth rules for non-HTTP traffic, and there is no point in creating Active Authentication rules for any non-HTTP traffic.

The Source/Destination criteria of an identity rule define the security zones (interfaces) through which the traffic passes, the IP addresses or the country or continent (geographical location) for the IP address, or the protocols and ports used in the traffic. The default is any zone, address, geographical location, protocol, and port.

To modify a condition, you click the + button within that condition, select the desired object or element, and click **OK** in the popup dialog box. If the criterion requires an object, you can click **Create New Object** if the object you require does not exist. Click the **x** for an object or element to remove it from the policy.

You can configure the following traffic matching criteria.

Source Zones, Destination Zones

The security zone objects that define the interfaces through which the traffic passes. You can define one, both, or neither criteria: any criteria not specified applies to traffic on any interface.

- To match traffic leaving the device from an interface in the zone, add that zone to the **Destination Zones**.
- To match traffic entering the device from an interface in the zone, add that zone to the **Source Zones**.
- If you add both source and destination zone conditions to a rule, matching traffic must originate from one of the specified source zones and egress through one of the destination zones.

Use this criteria when the rule should apply based on where the traffic enters or exits the device. For example, if you want to ensure that user identity is collected from all traffic originating from inside networks, select an inside zone as the **Source Zones** while leaving the destination zone empty.

Source Networks, Destination Networks

The network objects or geographical locations that define the network addresses or locations of the traffic.

- To match traffic from an IP address or geographical location, configure the **Source Networks**.
- To match traffic to an IP address or geographical location, configure the **Destination Networks**.
- If you add both source and destination network conditions to a rule, matching traffic must originate from one of the specified IP addresses and be destined for one of the destination IP addresses.

When you add this criteria, you select from the following tabs:

- **Network**—Select the network objects or groups that define the source or destination IP addresses for the traffic you want to control.
- **Geolocation**—Select the geographical location to control traffic based on its source or destination country or continent. Selecting a continent selects all countries within the continent. Besides selecting geographical location directly in the rule, you can also select a geolocation object that you created to define the location. Using geographical location, you could easily restrict access to a particular country without needing to know all of the potential IP addresses used there.

Note

To ensure you are using up-to-date geographical location data to filter your traffic, Cisco strongly recommends that you regularly update the geolocation database (GeoDB).

Source Ports, Destination Ports/Protocols

The port objects that define the protocols used in the traffic. For TCP/UDP, this can include ports.

- To match traffic from a protocol or port, configure the **Source Ports**. Source ports can be TCP/UDP only.
- To match traffic to a protocol or port, configure the **Destination Ports/Protocols**.
- To match traffic both originating from specific TCP/UDP ports and destined for specific TCP/UDP ports, configure both. If you add both source and destination ports to a condition, you can only add ports that share a single transport protocol, TCP or UDP. For example, you could target traffic from port TCP/80 to port TCP/8080.

Step 8 Click **OK**.

Enabling Transparent User Authentication

If you configure the identity policy to allow for active authentication, you can use the following authentication methods to acquire user identity:

HTTP Basic

With HTTP basic authentication, users are always prompted to authenticate with their directory username and password. The password is transmitted in clear text. For that reason, basic authentication is not considered a secure form of authentication.

Basic is the default authentication mechanism.

HTTP Response Page

This is a type of HTTP basic authentication, where the user is presented with a login browser page.

NTLM, HTTP Negotiate (Integrated Windows Authentication for Active Directory)

With integrated Windows authentication, you take advantage of the fact that users log into a domain to use their workstation. The browser tries to use this domain login when accessing a server, including the Firepower Threat Defense captive portal during active authentication. The password is not transmitted. If authentication is successful, the user is transparently authenticated; the user is unaware that any authentication challenge was made or satisfied.

If the browser cannot satisfy an authentication request using the domain login credentials, the user is prompted for username and password, which is the same user experience as basic authentication. Thus, if you configure integrated Windows authentication, it can reduce the need for users to supply credentials when accessing the network or servers in the same domain.

Note that HTTP Negotiate picks the strongest method supported by both the Active directory server and the user agent. If negotiation selects HTTP Basic as the authentication method, you will not get transparent authentication. The order of strength is NTLM, then basic. Negotiation must select NTLM for transparent authentication to be possible.

You must configure client browsers to support integrated Windows authentication to enable transparent authentication. The following sections explain the general requirements and basic configuration of integrated Windows authentication for some commonly used browsers that support it. Users should consult the help for their browser (or other user agent) for more detailed information, because the techniques can change between software releases.



Tip Not all browsers support integrated Windows authentication, such as Chrome and Safari (based on the versions available when this was written). Users will be prompted for username and password. Consult the browser's documentation to determine if support is available in the version you use.

Requirements for Transparent Authentication

Users must configure their browser or user agent to implement transparent authentication. They can do this individually, or you can configure it for them and push the configuration to client workstations using your software distribution tools. If you decide to have users do it themselves, ensure that you provide the specific configuration parameters that work for your network.

Regardless of browser or user agent, you must implement the following general configuration:

- Add the Firepower Threat Defense interface through which users connect to the network to the Trusted Sites list. You can use the IP address or if available, the fully-qualified domain name (for example, `inside.example.com`). You can also use wildcards or partial addresses to create a generalized trusted site. For example, you can typically cover all internal sites using `*.example.com` or simply `example.com`, trusting all servers in your network (use your own domain name). If you add the specific address of the interface, you might need to add several addresses to the trusted sites to account for all user access points to the network.
- Integrated Windows authentication does not work through a proxy server. Therefore, you must either not use a proxy, or you must add the Firepower Threat Defense interface to the addresses excluded from going through the proxy. If you decide that you must use a proxy, users will be prompted for authentication even if you use NTLM.



Tip Configuring transparent authentication is not a requirement, but a convenience to end users. If you do not configure transparent authentication, users are presented with a login challenge for all authentication methods.

Configuring Internet Explorer for Transparent Authentication

To configure Internet Explorer for NTLM transparent authentication:

Procedure

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- Step 1** Select **Tools > Internet Options**.
- Step 2** Select the **Security** tab, select the **Local Intranet** zone, then do the following:
- a) Click the **Sites** button to open the list of trusted sites.
 - b) Ensure that at least one of the following options is selected:
 - **Automatically detect intranet network**. If you select this option, all other options are disabled.
 - **Include all sites that bypass the proxy**.

- c) Click **Advanced** to open the Local Intranet Sites dialog box, then paste the URL you want to trust into the **Add Site** box and click **Add**.

Repeat the process if you have more than one URL. Use wildcards to specify a partial URL, such as `http://*.example.com` or simply `*.example.com`.

Close the dialog boxes to return to the Internet Options dialog box.

- d) With **Local Intranet** still selected, click **Custom Level** to open the Security Settings dialog box. Find the **User Authentication > Logon** setting and select **Automatic logon only in Intranet zone**. Click **OK**.

Step 3 In the Internet Options dialog box, click the **Connections** tab, then click **LAN Settings**.

If **Use a proxy server for your LAN** is selected, you need to ensure that the Firepower Threat Defense interface bypasses the proxy. Do any of the following as appropriate:

- Select **Bypass proxy server for local addresses**.
- Click **Advanced** and enter the address into the **Do not use proxy server for addresses beginning with** box. You can use wildcards, for example, `*.example.com`.

Configuring Firefox for Transparent Authentication

To configure Firefox for NTLM transparent authentication:

Procedure

Step 1 Open `about:config`. Use the filter bar to help you locate the preferences that you need to modify.

Step 2 To support NTLM, modify the following preferences (filter on `network.automatic`):

- **network.automatic-ntlm-auth.trusted-uris**—Double-click the preference, enter the URL, and click **OK**. You can enter multiple URLs by separating them with commas; including the protocol is optional. For example:

```
http://host.example.com, http://hostname, myhost.example.com
```

You can also use partial URLs. Firefox matches the end of the string, not a random substring. Thus, you could include your entire internal network by specifying just your domain name. For example:

```
example.com
```

- **network.automatic-ntlm-auth.allow-proxies**—Ensure that the value is **true**, which is the default. Double-click to change the value if it is currently false.

Step 3 Check the HTTP proxy settings. You can find these by selecting **Tools > Options**, then click the **Network** tab in the Options dialog box. Click the **Settings** button in the Connection group.

- If **No Proxy** is selected, there is nothing to configure.

- If **Use System Proxy Settings** is selected, you need to modify the **network.proxy.no_proxies_on** property in **about:config** to add the trusted URIs you included in **network.automatic-ntlm-auth.trusted-uris**.
 - If **Manual Proxy Configuration** is selected, update the **No Proxy For** list to include these trusted URIs.
 - If one of the other options is selected, ensure that the properties used for those configurations exclude the same trusted URIs.
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Monitoring Identity Policies

If identity policies that require authentication are working correctly, you should see user information on the **Monitoring > Users** dashboard and other dashboards that include user information.

In addition, events shown in **Monitoring > Events** should include user information.

If you do not see any user information, verify that the directory server is functioning correctly. Use the **Test** button in the directory server configuration dialog box to verify connectivity.

If the directory server is functioning and usable, verify that the traffic matching criteria on the identity rules that require active authentication are written in a way that will match your users. For example, ensure that the source zone contains the interfaces through which your user traffic will enter the device. The active authentication identity rules match HTTP traffic only, so users must be sending that type of traffic through the device.

Examples for Identity Policies

The use case chapter includes an example of implementing identity policies. Please see [How to Gain Insight Into Your Network Traffic](#).

