

CLI Users

Managed devices include a default **admin** account for CLI access. This chapter discusses how to create custom user accounts.

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CLI users

A CLI user is a user account that

- can be added as internal users or as external users on a LDAP or RADIUS server,
- is maintained separately on each managed device, and
- requires separate configuration for access to the Firewall Management Center versus managed devices.

User account separation

When you add a user to the Firewall Management Center, that user only has access to the Firewall Management Center; you cannot then use that username to log directly into a managed device. You must separately add a user on the managed device.

Internal and external users

Managed devices support two categories of users—internal and external—for user access control.

Internal users authenticate through a local database on the device. External users authenticate through LDAP or RADIUS servers when they are not found in the local database. Both user types enable secure access management for network devices.

User authentication types

Managed devices support these user authentication methods:

- Internal user: The device checks a local database for user authentication.
- External user: If the user is not present in the local database, the system queries an external LDAP or RADIUS authentication server.

CLI access

CLI access is a command-line interface capability that

- provides a Firepower CLI running on top of Linux for device administration
- enables creation of internal users on devices using the CLI, and
- supports establishment of external users on Firewall Threat Defense devices using the Firewall Management Center.

Security considerations for CLI access

Users with CLI Config level access can access the Linux shell using the **expert** command, and obtain `sudoers` privileges in the Linux shell, which can present a security risk.



Caution Users with CLI Config level access can access the Linux shell using the **expert** command, and obtain `sudoers` privileges in the Linux shell, which can present a security risk. For system security reasons, we strongly recommend:

- Only use the Linux shell under TAC supervision or when explicitly instructed by Firepower user documentation.
- Make sure that you restrict the list of users with CLI access appropriately.
- When granting CLI access privileges, restrict the list of users with Config level access.
- Do not add users directly in the Linux shell; only use the procedures in this chapter.
- Do not access Firepower devices using CLI expert mode unless directed by Cisco TAC or by explicit instructions in the Firepower user documentation.

CLI user roles

A CLI user role is an access control mechanism that

- determines the level of command access a user has on managed devices,
- controls whether users can execute configuration or non-configuration commands, and
- provides security by restricting unauthorized access to critical system functions.

Role types and permissions

On managed devices, user access to commands in the CLI depends on the role you assign.

- **None**: The user cannot log into the device on the command line.
- **Config**: The user can access all commands, including configuration commands. Exercise caution in assigning this level of access to users.
- **Basic**: The user can access non-configuration commands only. Only internal users and Firewall Threat Defense external RADIUS users support the Basic role.

Guidelines for CLI users

This reference provides essential guidelines for CLI users, including username requirements, default account information, and user account limits for different device models.

Usernames

- You cannot add the same username for both internal and external users. If the external server uses a duplicate username, the deployment to the device fails.
- The username must be Linux-valid:
  - Maximum 32 alphanumeric characters, plus hyphen (-) and underscore (_)
  - All lowercase
  - Cannot start with hyphen (-); cannot be all numbers; cannot include a period (.), at sign (@), or slash (/)

Defaults

All devices include an **admin** user as a local user account; you cannot delete the **admin** user. The default initial password is **Admin123**; the system forces you to change this during the initialization process. The agent stores the modified credentials in the Windows registry and uses the same encryption as the Firewall Management Center, which is Cipher Block Chaining (CBC). See the getting started guide for your model for more information about system initialization.

Number of user accounts

You can create a maximum of 43 user accounts for the Firepower 1000 and 2100.

Add an internal user at the CLI

Create internal users to provide authorized access to the Firewall Threat Defense system with appropriate privilege levels.

Use the CLI to create internal users on the Firewall Threat Defense.

Procedure

Step 1 Log into the device CLI using an account with Config privileges.

The **admin** user account has the required privileges, but any account with Config privileges will work. You can use an SSH session or the Console port.

For certain Firewall Threat Defense models, the Console port puts you into the FXOS CLI. Use the **connect ftd** command to get to the Firewall Threat Defense CLI.

Step 2 Create the user account.

configure user add *username* {**basic** | **config**}

- *username*—Sets the username. The username must be Linux-valid:
  - Maximum 32 alphanumeric characters, plus hyphen (-) and underscore (_)
  - All lowercase
  - Cannot start with hyphen (-); cannot be all numbers; cannot include a period (.), at sign (@), or slash (/)
- **basic**—Gives the user basic access. This role does not allow the user to enter configuration commands.
- **config**—Gives the user configuration access. This role gives the user full administrator rights to all commands.

Example:

This example adds a user account named johncrichton with Config access rights. The password is not shown as you type it.

```
> configure user add johncrichton config
Enter new password for user johncrichton: newpassword
Confirm new password for user johncrichton: newpassword
> show user
Login              UID   Auth Access  Enabled Reset    Exp Warn  Str Lock Max
admin             1000  Local Config  Enabled    No  Never  N/A  Dis   No N/A
johncrichton      1001  Local Config  Enabled    No  Never  N/A  Dis   No   5
```

Note
Tell users they can change their own passwords using the **configure password** command.

Step 3 (Optional) Adjust the characteristics of the account to meet your security requirements.

You can use these commands to change the default account behavior.

- **configure user aging** *username max_days warn_days*

  Sets an expiration date for the user's password. Specify the maximum number of days for the password to be valid followed by the number of days before expiration the user will be warned about the upcoming expiration. Both values are 1 to 9999, but the warning days must be less than the maximum days. When you create the account, there is no expiration date for the password.

- **configure user forcereset** *username*

  Forces the user to change the password on the next login.

- **configure user maxfailedlogins** *username number*

  Sets the maximum number of consecutive failed logins you will allow before locking the account, from 1 to 9999. Use the **configure user unlock** command to unlock accounts. The default for new accounts

is 5 consecutive failed logins. The admin account is exempt from being locked out after a maximum number of failed logins unless you enable security certification compliance.

- **configure user minpasswdlen** *username number*

  Sets a minimum password length, which can be from 1 to 127.

- **configure user strengthcheck** *username* {**enable** | **disable**}

  Enables or disables password strength checking, which requires a user to meet specific password criteria when changing their password. When a user's password expires or if the **configure user forcereset** command is used, this requirement is automatically enabled the next time the user logs in.

Step 4 Manage user accounts as necessary.

Users can get locked out of their accounts, or you might need to remove accounts or fix other issues. Use these commands to manage the user accounts on the system.

- **configure user access** *username* {**basic** | **config**}

  Changes the privileges for a user account.

- **configure user delete** *username*

  Deletes the specified account.

- **configure user disable** *username*

  Disables the specified account without deleting it. The user cannot log in until you enable the account.

- **configure user enable** *username*

  Enables the specified account.

- **configure user password** *username*

  Changes the password for the specified user. Users should normally change their own password using the **configure password** command.

  Caution
  Do not use the Linux **passwd** command in Expert Mode to change the admin user password. This command can cause file system corruption. Only use the regular Firewall Threat Defense CLI **configure user password admin** command (if you are not admin) or **configure password** command (if you are admin). If you do not know the password and can't log in at all, refer to the password recovery procedure.

- **configure user unlock** *username*

  Unlocks a user account that was locked due to exceeding the maximum number of consecutive failed login attempts.

Note
Firewall Threat Defense uses the Pluggable Authentication Module (PAM) framework for user authentication. Within this framework, the pam_unix.so module handles password hashing and verification using the SHA-512 algorithm

Passwords are hashed using the SHA-512 algorithm.

External authentication for the Firewall Threat Defense

External authentication for the Firewall Threat Defense is a security configuration that enables Firewall Threat Defense devices to authenticate users through external authentication servers by adding one or more external authentication objects.

External authentication for the Firewall Threat Defense

External authentication for the Firewall Threat Defense is a security feature that

- verifies user credentials with an LDAP or RADIUS server as specified in an external authentication object
- can be used by both the Firewall Management Center and Firewall Threat Defense devices, and
- allows only one external authentication object to be activated in the platform settings for the Firewall Threat Defense.

Authentication object sharing and user privileges

You can share the same object between the different appliance/device types or create separate objects.



Note The timeout range is different for the Firewall Threat Defense and the Firewall Management Center, so if you share an object, be sure not to exceed the Firewall Threat Defense's smaller timeout range (1-30 seconds for LDAP, and 1-300 seconds for RADIUS). If you set the timeout to a higher value, the Firewall Threat Defense external authentication configuration will not work.

Only a subset of fields in the external authentication object are used for Firewall Threat Defense SSH access. If you fill in additional fields, they are ignored. If you also use this object for other device types, those fields will be used.

User privilege levels:

- LDAP users always have Config privileges
- RADIUS users can be defined as either Config or Basic users

User definition options:

- For RADIUS: Define users on the RADIUS server (with the Service-Type attribute) or pre-define the user list in the external authentication object
- For LDAP: Specify a filter to match CLI users on the LDAP server

Note Users with CLI access can gain Linux shell access with the **expert** command. Linux shell users can obtain root privileges, which can present a security risk. Make sure that you:

- Restrict the list of users with Linux shell access.
- Do not create Linux shell users.

LDAP

The Lightweight Directory Access Protocol (LDAP) is a directory service protocol that allows you to set up a directory on your network that organizes objects, such as user credentials, in a centralized location. Multiple applications can then access those credentials and the information used to describe them. If you ever need to change a user's credentials, you can change them in one place.

LDAP binding information

Microsoft has announced that Active Directory servers will start enforcing LDAP binding and LDAP signing in 2020. Microsoft is making these a requirement because when using default settings, an elevation of privilege vulnerability exists in Microsoft Windows that could allow a man-in-the-middle attacker to successfully forward an authentication request to a Windows LDAP server. For more information, refer to 2020 LDAP channel binding and LDAP signing requirement for Windows on the Microsoft support site.

If you have not done so already, we recommend you start using TLS/SSL encryption to authenticate with an Active Directory server.

RADIUS

RADIUS is a network authentication protocol that

- provides centralized authentication and authorization for network access,
- operates using client-server architecture for user credential verification, and
- supports accounting functions to track user sessions and network usage.

Remote Authentication Dial In User Service (RADIUS) is an authentication protocol used to authenticate, authorize, and account for user access to network resources. You can create an authentication object for any RADIUS server that conforms to RFC 2865.

Secure Firewall devices support the use of SecurID tokens. When you configure authentication by a server using SecurID, users authenticated against that server append the SecurID token to the end of their SecurID PIN and use that as their password when they log in. You do not need to configure anything extra on the Secure Firewall device to support SecurID.

By default, RADIUS uses port 1812 for authentication and port 1813 for accounting.

If you change the RADIUS authentication port, the RADIUS accounting port changes accordingly. Ensure that the Firewall Management Center can connect to the RADIUS server on the new accounting port; otherwise, authentication delays may occur.

Although you cannot configure RADIUS accounting parameters, the Firewall Threat Defense uses port 1813 for RADIUS accounting on the same server used for authentication. If the RADIUS server is unreachable on port 1813, it can cause delays in logging in.

Add an LDAP external authentication object for Firewall Threat Defense

Create external authentication object to provide authorized access to the Firewall Threat Defense system via LDAP, with appropriate privilege levels.

Add an LDAP server to support external users for Firewall Threat Defense management.

In a multidomain deployment, external authentication objects are only available in the domain in which they are created.

Sharing External Authentication

External LDAP objects can be used by the Firewall Management Center and Firewall Threat Defense devices. You can share the same object between the Firewall Management Center and devices or create separate objects. Be sure that both the Firewall Threat Defense and the Firewall Management Center can reach the LDAP server, even if you are not sharing the object. The Firewall Management Center is essential to retrieving the user list and downloading it to the device.



Note For LDAP, the timeout range is different for the Firewall Threat Defense and the Firewall Management Center , so if you share an object, be sure not to exceed the Firewall Threat Defense 's smaller timeout range (1-30 seconds). If you set the timeout to a higher value, the deployment to the Firewall Threat Defense will fail.

Supported Fields

Only a subset of fields in the LDAP object are used for Firewall Threat Defense SSH access. If you fill in additional fields, they are ignored. If you also use this object for the Firewall Management Center , those fields will be used. This procedure only covers the supported fields for the Firewall Threat Defense. For other fields, refer to "Add an LDAP External Authentication Object for Firewall Management Center " in the *Cisco Secure Firewall Management Center Administration Guide* .

Usernames

Usernames must be Linux-valid usernames:

- Maximum 32 alphanumeric characters, plus hyphen (-) and underscore (_)
- All lowercase
- Cannot start with hyphen (-); cannot be all numbers; cannot include a period (.), at sign (@), or slash (/)

You cannot add the **admin** or **sshd** users for external authentication.

You can only add external users (as part of the External Authentication object) in the Firewall Management Center ; you cannot add them at the CLI. Note that internal users can only be added at the CLI, not in the Firewall Management Center.

If you previously configured the same username for an internal user using the **configure user add** command, the Firewall Threat Defense first checks the password against the internal user, and if that fails, it checks the LDAP server. Note that you cannot later add an internal user with the same name as an external user; only pre-existing internal users are supported.

Privilege Level

LDAP users always have Config privileges.

Before you begin

You must specify DNS server(s) for domain name lookup on your device. Even if you specify an IP address and not a hostname for the LDAP server on this procedure, the LDAP server may return a URI for authentication that can include a hostname. A DNS lookup is required to resolve the hostname. Refer to Modify Firewall Threat Defense management interface settings at the CLI to add DNS servers.

Procedure

Step 1 Choose **System** (⚙) > **Users**. Click the **External Authentication** tab.

Step 2 Click (+) **Add External Authentication Object**.

Step 3 Set the **Authentication Method** to **LDAP**.

a) Enter a **Name** and optional **Description**.

b) Choose a **Server Type** from the drop-down list.

Step 4 For the **Primary Server** , enter a **Host Name/IP Address**.

a) Change the **Port** from the default

If you are using a certificate to connect via TLS or SSL, the host name in the certificate must match the host name used in this field. In addition, IPv6 addresses are not supported for encrypted connections.

Step 5 (Optional) Enter the **Backup Server** parameters.

Step 6 Enter **LDAP-Specific Parameters**.

a) Enter the **Base DN** for the LDAP directory you want to access. For example, to authenticate names in the Security organization at the Example company, enter `ou=security,dc=example,dc=com`. Alternatively click **Fetch DNs** , and choose the appropriate base distinguished name from the drop-down list.

b) (Optional) Enter the **Base Filter**.

For example, if the user objects in a directory tree have a `physicalDeliveryOfficeName` attribute and users in the New York office have an attribute value of `NewYork` for that attribute, to retrieve only users in the New York office, enter `(physicalDeliveryOfficeName=NewYork)`.

To retrieve all cn names, except for disallowed users admin and sshd, enter `(&(cn=*)(!(|(cn=sshd)(cn=admin))))`.

c) Enter a **User Name** for a user who has sufficient credentials to browse the LDAP server. For example, if you are connecting to an OpenLDAP server where user objects have a `uid` attribute, and the object for the administrator in the Security division at your example company has a `uid` value of `NetworkAdmin` , you might enter `uid=NetworkAdmin,ou=security,dc=example,dc=com`.

d) Enter the user password in the **Password** and the **Confirm Password** fields.

e) (Optional) Click **Show Advanced Options** to configure the following advanced options.

- **Encryption** —Click **None** , **TLS** , or **SSL**.

  If you change the encryption method after specifying a port, you reset the port to the default value for that method. For **None** or **TLS** , the port resets to the default value of 389. If you choose SSL encryption, the port resets to 636.

- **SSL Certificate Upload Path** —For SSL or TLS encryption, you must choose a certificate by clicking **Choose File**.

  If you previously uploaded a certificate and want to replace it, upload the new certificate and redeploy the configuration to your devices to copy over the new certificate.

Note
TLS encryption requires a certificate on all platforms. For SSL, the Firewall Threat Defense also requires a certificate. For other platforms, SSL does not require a certificate. However, we recommend that you *always* upload a certificate for SSL to prevent man-in-the-middle attacks.

- (Not Used) **User Name Template** —Not used by the Firewall Threat Defense.
- **Timeout (Seconds)** —Enter the number of seconds before rolling over to the backup connection, between 1 and 30. The default is 30.

Note
The timeout range is different for the Firewall Threat Defense and the Firewall Management Center , so if you share an object, be sure not to exceed the Firewall Threat Defense 's smaller timeout range (1-30 seconds). If you set the timeout to a higher value, the Firewall Threat Defense LDAP configuration will not work.

Step 7 Configure **Attribute Mapping** to retrieve users based on an attribute.

- Enter a **UI Access Attribute**.**Note** : This field is not used for device CLI access; however, it is a required field, so you need to enter a value. You can just enter the same value that you enter for the **CLI Access Attribute**.
- Set the **CLI Access Attribute** if you want to use a CLI access attribute other than the user distinguished type. For example, on a Microsoft Active Directory Server, use the `sAMAccountName` CLI access attribute to retrieve CLI access users by typing `sAMAccountName`.

Note
Users with CLI access can gain Linux shell access with the **expert** command. Linux shell users can obtain root privileges, which can present a security risk. Make sure that you restrict the list of users with CLI or Linux shell access.

Note
Deploying an external authentication object that allows a large number of users with CLI access may cause deployments to time out and fail while waiting for the users to be created.

Step 8 Set the **CLI Access Filter**.

Choose one of the following methods:

- To use the same filter you specified when configuring authentication settings, check the check box of **Same as Base Filter**.
- To retrieve administrative user entries based on attribute value, enter the attribute name, a comparison operator, and the attribute value you want to use as a filter, enclosed in parentheses. For example, if all network administrators have a `manager` attribute which has an attribute value of `shell` , you can set a base filter of `(manager=shell)`.

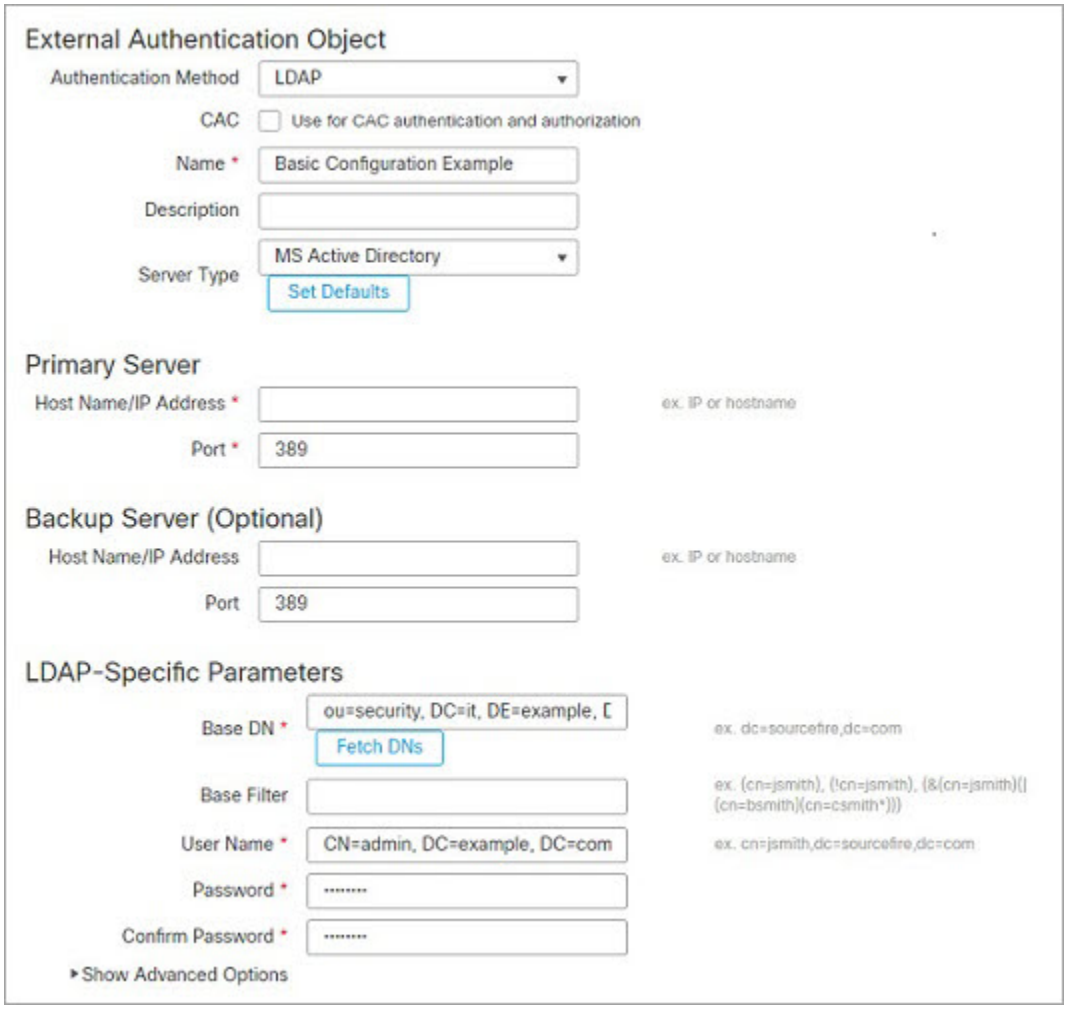
For username guidelines, refer to Usernames at the start of this procedure.

Step 9 Click **Save** and enable use of this server. For more information refer to Configure external authentication.

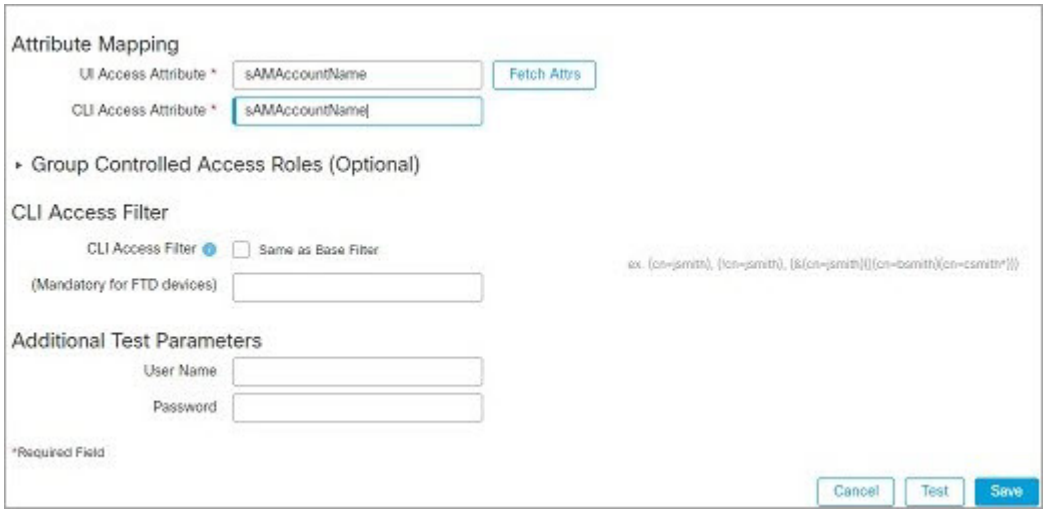
Note

If you later add or delete users on the LDAP server, you must redeploy the Platform Settings on managed devices. The Firewall Management Center redownloads the user list and deploys it to the device. For more information refer to Deploy configuration changes.

The following figures illustrate a basic configuration of an LDAP login authentication object for a Microsoft Active Directory Server. The LDAP server in this example has an IP address of 10.11.3.4. The connection uses port 389 for access.



This example shows a connection using a base distinguished name of `OU=security,DC=it,DC=example,DC=com` for the security organization in the information technology domain of the Example company.

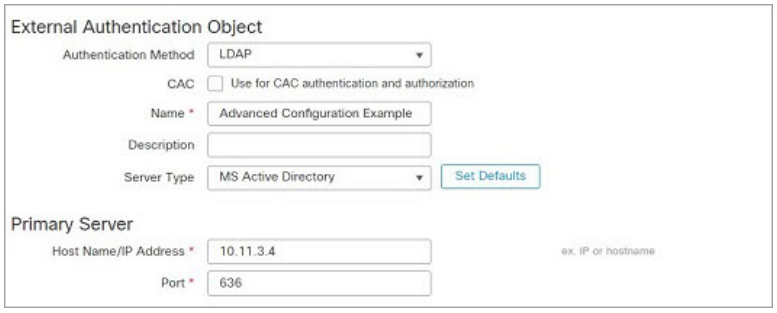


A **CLI Access Attribute** of `sAMAccountName` causes each `sAMAccountName` attribute to be checked for all objects in the directory for matches when a user logs into the Firewall Threat Defense.

Note that because no base filter is applied to this server, the Firewall Threat Defense checks attributes for all objects in the directory indicated by the base distinguished name. Connections to the server time out after the default time period (or the timeout period set on the LDAP server).

Advanced Example

This example illustrates an advanced configuration of an LDAP login authentication object for a Microsoft Active Directory Server. The LDAP server in this example has an IP address of 10.11.3.4. The connection uses port 636 for access.



This example shows a connection using a base distinguished name of `OU=security,DC=it,DC=example,DC=com` for the security organization in the information technology domain of the Example company. However, note that this server has a base filter of `(cn=*smith)`. The filter restricts the users retrieved from the server to those with a common name ending in `smith`.



The connection to the server is encrypted using SSL and a certificate named `certificate.pem` is used for the connection. In addition, connections to the server time out after 60 seconds because of the **Timeout (Seconds)** setting.

Because this server is a Microsoft Active Directory server, it uses the `sAMAccountName` attribute to store user names rather than the `uid` attribute.

The **CLI Access Attribute** of `sAMAccountName` causes each `sAMAccountName` attribute to be checked for all objects in the directory for matches when a user logs into the Firewall Threat Defense.

In the following example, the CLI access filter is set to be the same as the base filter.



Add a RADIUS external authentication object for Firewall Threat Defense

Configure a RADIUS server on the Firewall Threat Defense

Add a RADIUS server to support external users for the Firewall Threat Defense

Sharing External Authentication Objects

You can share the same object between the Firewall Management Center and devices or create separate objects. Note that the Firewall Threat Defense supports defining users on the RADIUS server, while the Firewall Management Center requires you to predefine the user list in the external authentication object. You can choose to use the predefined list method for the Firewall Threat Defense , but if you want to define users on the RADIUS server, you must create separate objects for the Firewall Threat Defense and the Firewall Management Center.

Note The timeout range is different for the Firewall Threat Defense and the Firewall Management Center , so if you share an object, be sure not to exceed the Firewall Threat Defense 's smaller timeout range (1-300 seconds). If you set the timeout to a higher value, the Firewall Threat Defense RADIUS configuration will not work.

Firewall Threat DefenseFirewall Threat Defense

Only a subset of fields in the RADIUS object are used for Firewall Threat Defense SSH access. If you fill in additional fields, they are ignored. If you also use this object for the Firewall Management Center , those fields will be used. This procedure only covers the supported fields for the Firewall Threat Defense. For other fields, refer to Add a RADIUS External Authentication Object for Firewall Management Center in the *Cisco Secure Firewall Management Center Administration Guide*.

Firewall Threat Defense

You cannot add the **admin** user for external authentication. You can only add external users (as part of the External Authentication object) in the Firewall Management Center ; you cannot add them at the CLI. Note that internal users can only be added at the CLI, not in the Firewall Management Center.

If you previously configured the same username for an internal user using the **configure user add** command, the Firewall Threat Defense first checks the password against the internal user, and if that fails, it checks the RADIUS server. Note that you cannot later add an internal user with the same name as an external user; only pre-existing internal users are supported. For users defined on the RADIUS server, be sure to set the privilege level to be the same as any internal users; otherwise you cannot log in using the external user password.

Before you begin

Define users on the RADIUS server using the Service-Type attribute.

These are supported values for the Service-Type attribute:

- Administrator (6)—Provides Config access authorization to the CLI. These users can use all commands in the CLI.
- NAS Prompt (7) or any level other than 6—Provides Basic access authorization to the CLI. These users can use read-only commands, such as **show** commands, for monitoring and troubleshooting purposes.

The names must be Linux-valid usernames:

- Maximum 32 alphanumeric characters, plus hyphen (-) and underscore (_)
- All lowercase
- Cannot start with hyphen (-); cannot be all numbers; cannot include a sign (@) or slash (/)

Alternatively, you can predefine users in the external authentication object (refer to Step 6, on page 15). To use the same RADIUS server for the Firewall Threat Defense and Firewall Management Center while using the Service-Type attribute method for the Firewall Threat Defense , create two external authentication objects that identify the same RADIUS server: one object includes the predefined **CLI Access Filter** users (for use with the Firewall Management Center), and the other object leaves the **CLI Access Filter** empty (for use with Firewall Threat Defense s).

Procedure

Step 1 In the Firewall Management Center , choose **System** (⚙) > **Users**.

Step 2 Click **External Authentication** and select (+) **Add External Authentication Object**.

a) Set the **Authentication Method** to **RADIUS**.

b) Enter a **Name** and optional **Description**.

Step 3 For the **Primary Server** , enter a **Host Name/IP Address**.

a) Change the **Port** from the default.

b) Enter the **RADIUS Secret Key**.

Only IPv4 is supported.

Note
If you are using a certificate to connect via TLS or SSL, the host name in the certificate must match the host name used in this field.

Step 4 (Optional) Enter the **Backup Server** parameters.

Step 5 (Optional) Enter **RADIUS-Specific Parameters**.

a) Enter the **Timeout (Seconds)** in seconds before retrying the primary server, between 1 and 300. The default is 30.

Note
The timeout range is different for the Firewall Threat Defense and the Firewall Management Center , so if you share an object, be sure not to exceed the Firewall Threat Defense 's smaller timeout range (1-300 seconds). If you set the timeout to a higher value, the Firewall Threat Defense RADIUS configuration will not work.

b) Enter the **Retries** before rolling over to the backup server. The default is 3.

Step 6 (Optional) Instead of using RADIUS-defined users, in the **CLI Access Filter** area **Administrator CLI Access User List** field, enter the user names that should have CLI access, separated by commas. For example, enter `jchrichton, aerynsun, rygel`.

You may want to use the **CLI Access Filter** method for Firewall Threat Defense so you can use the same external authentication object with Firewall Threat Defense and other platform types.

Note
If you want to use RADIUS-defined users, you must leave the **CLI Access Filter** empty.

Make sure that these usernames match usernames on the RADIUS server. The names must be Linux-valid usernames:

- Maximum 32 alphanumeric characters, plus hyphen (-) and underscore (_)
- All lowercase
- Cannot start with hyphen (-); cannot be all numbers; cannot include a period (.), at sign (@), or slash (/)

Note
Users with CLI access can gain Linux shell access with the **expert** command. Linux shell users can obtain root privileges, which can present a security risk. Make sure that you restrict the list of users with CLI or Linux shell access.

Note
Deploying an external authentication object that allows a large number of users with CLI access may cause deployments to time out and fail while waiting for the users to be created.

Step 7 (Optional) Click **Test** to test Firewall Management Center connectivity to the RADIUS server.

This function can only test Firewall Management Center connectivity to the RADIUS server; there is no test function for managed device connectivity to the RADIUS server.

Step 8 (Optional) You can also enter **Additional Test Parameters** to test user credentials for a user who should be able to authenticate: enter a **User Name** and **Password** , and then click **Test**.

Tip
If you mistype the name or password of the test user, the test fails even if the server configuration is correct. To verify that the server configuration is correct, click **Test** without entering user information in the **Additional Test Parameters** field first. If that succeeds, supply a user name and password to test with the specific user.

Example:

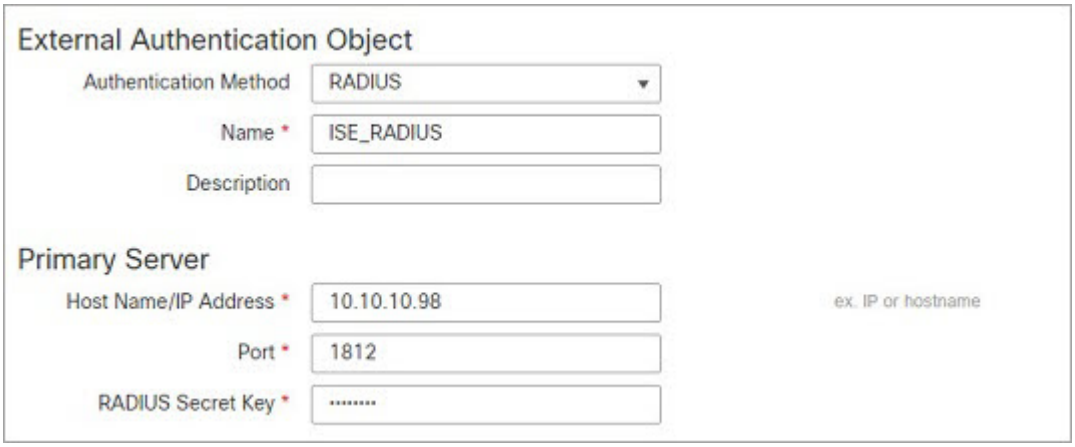
To test if you can retrieve the `JSmith` user credentials at the Example company, enter `JSmith` and the correct password.

Step 9 Click **Save** and enable use of this server. For more information refer to Configure external authentication

Examples

Simple User Role Assignments

This figure illustrates a sample RADIUS login authentication object for a server running Cisco Identity Services Engine (ISE) with an IP address of 10.10.10.98 on port 1812. No backup server is defined.



This example shows RADIUS-specific parameters, including the timeout (30 seconds) and number of failed retries before the system attempts to contact the backup server, if any.

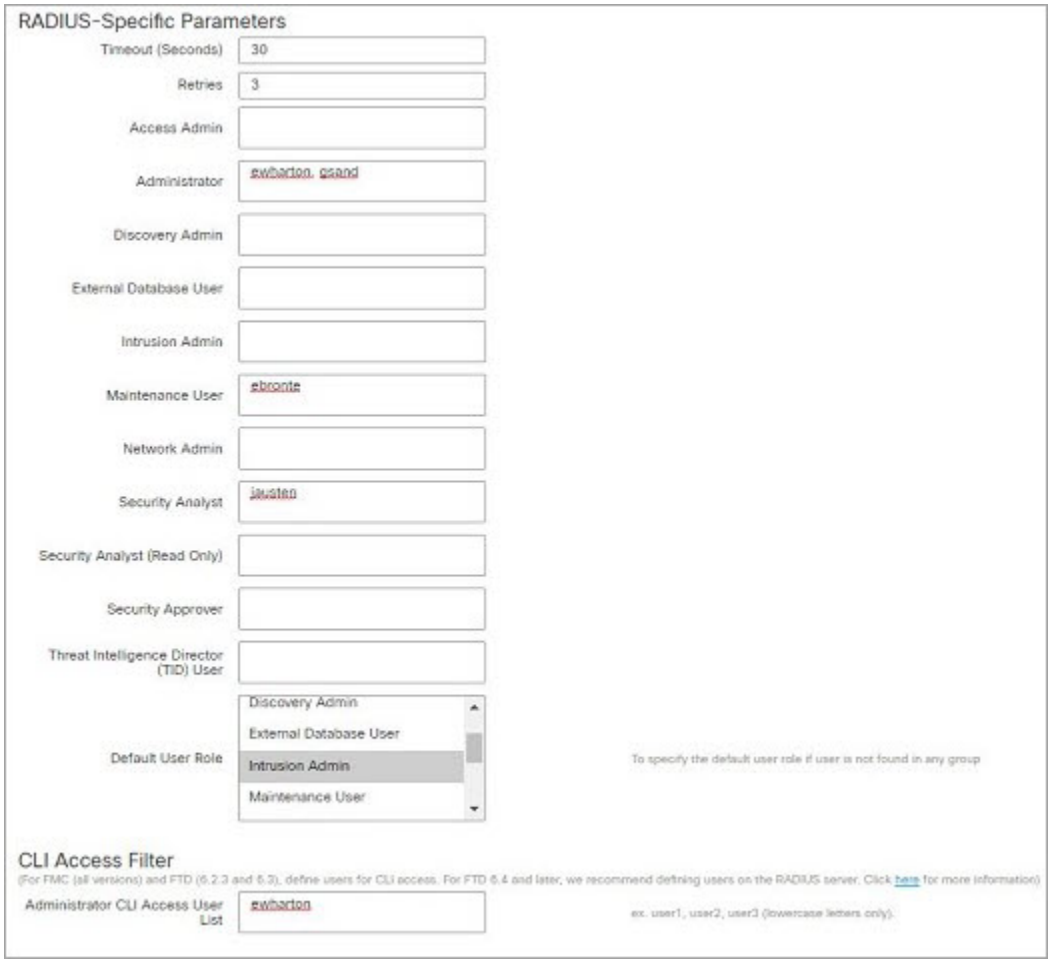
This example illustrates important aspects of RADIUS user role configuration:

Users `ewharton` and `gsand` are granted web interface Administrative access.

The user `cbronte` is granted web interface Maintenance User access.

The user `jausten` is granted web interface Security Analyst access.

The user `ewharton` can log into the device using a CLI account.



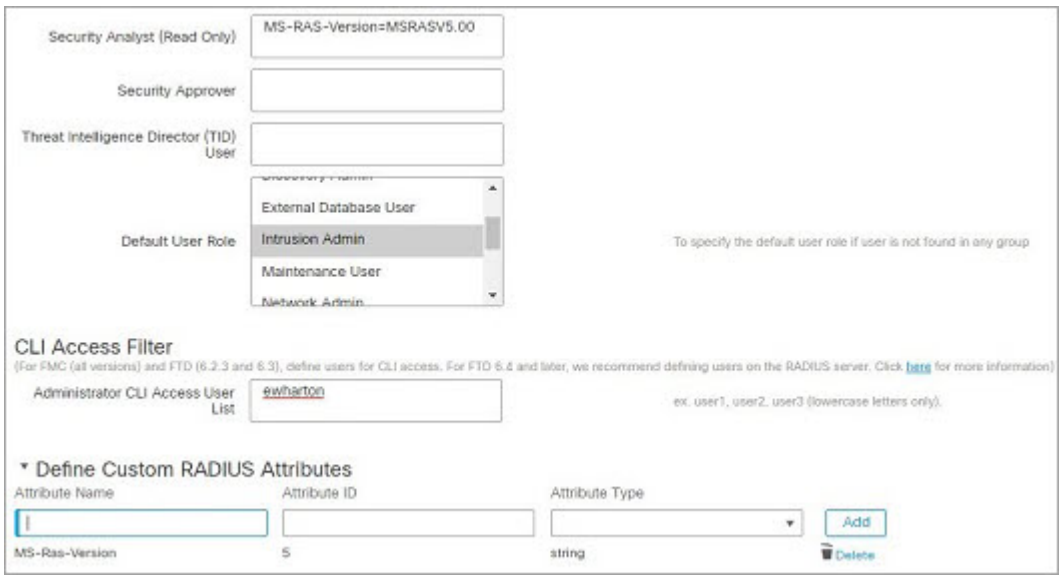
This graphic depicts the role configuration for the example:

Roles for Users Matching an Attribute-Value Pair

You can use an attribute-value pair to identify users who should receive a particular user role. If the attribute you use is a custom attribute, you must define the custom attribute.

This figure illustrates the role configuration and custom attribute definition in a sample RADIUS login authentication object for the same ISE server as in the previous example.

In this example, however, the `MS-RAS-Version` custom attribute is returned for one or more of the users because a Microsoft remote access server is in use. Note the `MS-RAS-Version` custom attribute is a string. In this example, all users logging in to RADIUS through a Microsoft v. 5.00 remote access server should receive the Security Analyst (Read Only) role, so you enter the attribute-value pair of `MS-RAS-Version=MSRASV5.00` in the **Security Analyst (Read Only)** field.



External authentication for users on Firewall Threat Defense devices

External authentication for users on Firewall Threat Defense devices is a security configuration that enables authentication through external authentication servers rather than local device credentials.

Configuration process

Enable External Authentication in the Threat Defense Platform Settings, and then deploy the settings to the managed devices. Refer to Configure external authentication for more information.

Troubleshoot LDAP authentication connections

This reference provides troubleshooting information for resolving LDAP authentication connection problems in your system configuration.

If you create an LDAP authentication object and it either does not succeed in connecting to the server you select or does not retrieve the list of users you want, you can tune the settings in the object.

If the connection fails when you test it, try the following suggestions to troubleshoot your configuration:

- Use the messages displayed at the top of the web interface screen and in the test output to determine which areas of the object are causing the issue.
- Check that the user name and password you used for the object are valid:
  - Check that you have the rights to browse to the directory indicated in your base-distinguished name by connecting to the LDAP server using a third-party LDAP browser.
  - Check that the user name is unique to the directory information tree for the LDAP server.
  - If you see an LDAP bind error 49 in the test output, the user binding for the user failed. Try authenticating to the server through a third-party application to see if the binding fails through that connection as well.

    - When configuring LDAP authentication, avoid using a backslash ("\") in the binding password. The presence of a backslash in the password causes the LDAP binding process to fail, resulting in unsuccessful external authentication.

- Check that you have correctly identified the server:
    - Check that the server IP address or host name is correct.
    - Check that you have TCP/IP access from your local appliance to the authentication server where you want to connect.
    - Check that access to the server is not blocked by a firewall and that the port you have configured in the object is open.
    - If you are using a certificate to connect via TLS or SSL, the host name in the certificate must match the host name used for the server.
    - Check that you have not used an IPv6 address for the server connection if you are authenticating CLI access.
    - If you used server type defaults, check that you have the correct server type and click **Set Defaults** again to reset the default values.
- If you typed in your base-distinguished name, click **Fetch DNs** to retrieve all the available base distinguished names on the server, and select the name from the list.
- If you are using any filters, access attributes, or advanced settings, check that each is valid and typed correctly.
- If you are using any filters, access attributes, or advanced settings, try removing each setting and testing the object without it.
- If you are using a base filter or a CLI access filter, make sure that the filter is enclosed in parentheses and that you are using a valid comparison operator (maximum 450 characters, including the enclosing parentheses).
- To test a more restricted base filter, try setting it to the base distinguished name for the user to retrieve just that user.
- If you are using an encrypted connection:
    - Check that the name of the LDAP server in the certificate matches the host name that you use to connect.
    - Check that you have not used an IPv6 address with an encrypted server connection.
- If you are using a test user, make sure that the user name and password are typed correctly.
- If you are using a test user, remove the user credentials and test the object.
- Test the query that you are using by connecting to the LDAP server and using this syntax:

```
ldapsearch -x -b 'base_distinguished_name'
-h LDAPserver_ip_address -p port -v -D
'user_distinguished_name' -W 'base_filter'
```

For example, if you are trying to connect to the security domain on `myrtle.example.com` using the `domainadmin@myrtle.example.com` user and a base filter of (`cn=*`), you could test the connection using this statement:

```
ldapsearch -x -b 'CN=security,DC=myrtle,DC=example,DC=com'
-h myrtle.example.com -p 389 -v -D
'domainadmin@myrtle.example.com' -W '(cn=*)'
```

If you can test your connection successfully but authentication does not work after you deploy a platform settings policy, check that authentication and the object you want to use are both enabled in the platform settings policy that is applied to the device.

If you connect successfully but want to adjust the list of users retrieved by your connection, you can add or change a base filter or CLI access filter or use a more restrictive or less restrictive base DN.

While authenticating a connection to Active Directory (AD) server, rarely the connection event log indicates blocked LDAP traffic although the connection to AD server is successful. This incorrect connection log occurs when the AD server sends a duplicate reset packet. The Firewall Threat Defense device identifies the second reset packet as part of a new connection request and logs the connection with Block action.

History for CLI users

This reference provides version history information for CLI user features, including authentication enhancements and external authentication support for SSH access.

Feature	Minimum Firewall Management Center	Minimum Firewall Threat Defense	Details
Support for the Service-Type attribute for Firewall Threat Defense users defined on the RADIUS server.	6.4.0	Any	For RADIUS authentication of Firewall Threat Defense CLI users, you used to have to pre-define the usernames in the RADIUS external authentication object and manually make sure that the list matched usernames defined on the RADIUS server. You can now define CLI users on the RADIUS server using the Service-Type attribute and also define both Basic and Config user roles. To use this method, be sure to leave the shell access filter blank in the external authentication object. New/modified screens: **System** > **Users** > **External Authentication** > **Add External Authentication Object** > **Shell Access Filter**
External authentication for Firewall Threat Defense SSH access.	6.2.3	Any	You can now configure external authentication for SSH access to the Firewall Threat Defense using LDAP or RADIUS. New/modified screens: **Devices** > **Platform Settings** > **External Authentication**