Red Hat Enterprise Linux 8

Configuring and managing Identity Management

Configuring, managing and maintaining Identity Management in Red Hat Enterprise Linux 8

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Legal Notice

Abstract

This documentation collection provides instructions on how to effectively configure, manage and maintain Identity Management on Red Hat Enterprise Linux 8.

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  2. As the Component, use **Documentation**.
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CHAPTER 1. LOGGING IN TO IDENTITY MANAGEMENT FROM THE COMMAND LINE

Identity Management (IdM) uses the Kerberos protocol to support single sign-on. Single sign-on means that the user enters the correct user name and password only once, and then accesses IdM services without the system prompting for the credentials again.

IMPORTANT

In IdM, the System Security Services Daemon (SSSD) automatically obtains a ticket-granting ticket (TGT) for a user after the user successfully logs in to the desktop environment on an IdM client machine with the corresponding Kerberos principal name. This means that after logging in, the user is not required to use the **kinit** utility to access IdM resources.

If you have cleared your Kerberos credential cache or your Kerberos TGT has expired, you need to request a Kerberos ticket manually to access IdM resources. The following sections present basic user operations when using Kerberos in IdM.

1.1. USING KINIT TO LOG IN TO IDM MANUALLY

This procedure describes using the **kinit** utility to authenticate to an Identity Management (IdM) environment manually. The **kinit** utility obtains and caches a Kerberos ticket-granting ticket (TGT) on behalf of an IdM user.

NOTE

Only use this procedure if you have destroyed your initial Kerberos TGT or if it has expired. As an IdM user, when logging onto your local machine you are also automatically logging in to IdM. This means that after logging in, you are not required to use the **kinit** utility to access IdM resources.

Procedure

1. To log in to IdM

   - under the user name of the user who is currently logged in on the local system, use **kinit** without specifying a user name. For example, if you are logged in as **example_user** on the local system:

     ```
     [example_user@server ~]$ kinit
     Password for example_user@EXAMPLE.COM:
     [example_user@server ~]$
     ```

     If the user name of the local user does not match any user entry in IdM, the authentication attempt fails:

     ```
     [example_user@server ~]$ kinit
     kinit: Client 'example_user@EXAMPLE.COM' not found in Kerberos database while
     getting initial credentials
     ```

   - using a Kerberos principal that does not correspond to your local user name, pass the required user name to the **kinit** utility. For example, to log in as the **admin** user:

```
[example_user@server ~]$ kinit admin
Password for admin@EXAMPLE.COM:
[example_user@server ~]$
```

2. Optionally, to verify that the login was successful, use the **klist** utility to display the cached TGT. In the following example, the cache contains a ticket for the **example_user** principal, which means that on this particular host, only **example_user** is currently allowed to access IdM services:

```
$ klist
Ticket cache: KEYRING:persistent:0:0
Default principal: example_user@EXAMPLE.COM

Valid starting       Expires              Service principal
11/10/2019 08:35:45  11/10/2019 18:35:45  krbtgt/EXAMPLE.COM@EXAMPLE.COM
```

1.2. DESTROYING A USER'S ACTIVE KERBEROS TICKET

This section describes how to clear the credentials cache that contains the user's active Kerberos ticket.

Procedure

1. To destroy your Kerberos ticket:

```
[example_user@server ~]$ kdestroy
```

2. Optionally, to check that the Kerberos ticket has been destroyed:

```
[example_user@server ~]$ klist
klist: Credentials cache keyring 'persistent:0:0' not found
```

1.3. CONFIGURING AN EXTERNAL SYSTEM FOR KERBEROS AUTHENTICATION

This section describes how to configure an external system so that Identity Management (IdM) users can log in to IdM from the external system using their Kerberos credentials.

Enabling Kerberos authentication on external systems is especially useful when your infrastructure includes multiple realms or overlapping domains. It is also useful if the system has not been enrolled into any IdM domain through **ipa-client-install**.

To enable Kerberos authentication to IdM from a system that is not a member of the IdM domain, define an IdM-specific Kerberos configuration file on the external system.

Prerequisites

- The **krb5-workstation** package is installed on the external system.
  To find out whether the package is installed, use the following CLI command:

```
# yum list installed krb5-workstation
Installed Packages
krb5-workstation.x86_64    1.16.1-19.el8    @BaseOS
```

Procedure

1. Copy the **/etc/krb5.conf** file from the IdM server to the external system. For example:

```
# scp /etc/krb5.conf root@externalsystem.example.com:/etc/krb5_ipa.conf
```

WARNING

Do not overwrite the existing **krb5.conf** file on the external system.

2. On the external system, set the terminal session to use the copied IdM Kerberos configuration file:

```
$ export KRB5_CONFIG=/etc/krb5_ipa.conf
```

The **KRB5_CONFIG** variable exists only temporarily until you log out. To prevent this loss, export the variable with a different file name.

3. Copy the Kerberos configuration snippets from the **/etc/krb5.conf.d/** directory to the external system.

Users on the external system can now use the **kinit** utility to authenticate against the IdM server.

Additional resources

- For details on Kerberos, see the **krb5.conf(5)**, **kinit(1)**, **klist(1)**, and **kdestroy(1)** man pages.

CHAPTER 2. VIEWING, STARTING AND STOPPING THE IDENTITY MANAGEMENT SERVICES

Identity Management (IdM) servers are Red Hat Enterprise Linux systems that work as domain controllers (DCs). A number of different services are running on IdM servers, most notably the Directory Server, Certificate Authority (CA), DNS, and Kerberos.

2.1. VIEWING THE STATUS OF IDM SERVICES

To view the status of the IdM services that are configured on your IdM server:

```
[root@server ~]# ipactl status
Directory Service: RUNNING
krb5kdc Service: RUNNING
kadmin Service: RUNNING
named Service: RUNNING
httpd Service: RUNNING
ntpd Service: RUNNING
pki-tomcatd Service: RUNNING
smb Service: RUNNING
winbind Service: RUNNING
ipa-otpd Service: RUNNING
ipa-dnskeysyncd Service: RUNNING
ipa: INFO: The ipactl command was successful
```

In the output above:

- The Kerberos service is divided into two parts, **krb5kdc** and **kadmin**. The **krb5kdc** service is the Kerberos version 5 Authentication service and Key Distribution Center (KDC) deamon. The **kadmin** service is the Kerberos V5 database administration program.
- The **named** service refers to the Internet domain name service (DNS).
- **pki** is the Command-Line Interface for accessing Certificate System services. The **pki-tomcatd** program handles Identity Management operations related to certificates.

The output of the **ipactl status** command on your server depends on your IdM configuration. For example, if an IdM deployment does not include a DNS server, the **named** service is not present in the list.

NOTE

You cannot use the IdM web UI to view the status of all the IdM services running on a particular IdM server. Kerberized services running on different servers can be viewed in the **Identity → Services** tab of the IdM web UI.

You can start or stop the entire server, or an individual service only.

To start, stop, or restart the entire IdM server, see:

- Section 2.2, “Starting and stopping the entire Identity Management server: the **ipactl** utility”

To start, stop, or restart an individual IdM service, see:

- Section 2.3, “Starting and stopping an individual Identity Management service: the **systemctl** utility”

2.2. STARTING AND STOPPING THE ENTIRE IDENTITY MANAGEMENT SERVER: THE IPACTL UTILITY

Use the **ipactl** utility to stop, start, or restart the entire IdM server along with all the installed services. Using the **ipactl** utility ensures all services are stopped, started, or restarted in the appropriate order. You do not need to have a valid Kerberos ticket to run the **ipactl** commands.

ipactl commands
To start the entire IdM server:

```
# ipactl start
```

To stop the entire IdM server:

```
# ipactl stop
```

To restart the entire IdM server:

```
# ipactl restart
```

To show the status of all the services that make up IdM:

```
# ipactl status
```

IMPORTANT

You cannot use the IdM web UI to perform the **ipactl** commands.

2.3. STARTING AND STOPPING AN INDIVIDUAL IDENTITY MANAGEMENT SERVICE: THE SYSTEMCTL UTILITY

Changing IdM configuration files manually is generally not recommended. However, certain situations require that an administrator performs a manual configuration of specific services. In such situations, use the **systemctl** utility to stop, start, or restart an individual IdM service.

For example, use **systemctl** after customizing the Directory Server behavior, without modifying the other IdM services:

```
# systemctl restart dirsrv@REALM-NAME.service
```

Also, when initially deploying an IdM trust with Active Directory, modify the **/etc/sssd/sssd.conf** file, adding:

- specific parameters to tune the timeout configuration options in an environment where remote servers have a high latency
- specific parameters to tune the Active Directory site affinity
- overrides for certain configuration options that are not provided by the global IdM settings

To apply the changes you have made in the **/etc/sssd/sssd.conf** file:

```
# systemctl restart sssd.service
```

Running **systemctl restart sssd.service** is required because the System Security Services Daemon (SSSD) does not automatically re-read or re-apply its configuration.

Note that for changes that affect IdM identity ranges, a complete server reboot is recommended.

IMPORTANT

To restart multiple IdM domain services, always use **ipactl**. Because of dependencies between the services installed with the IdM server, the order in which they are started and stopped is critical. The **ipactl** utility ensures that the services are started and stopped in the appropriate order.

Useful systemctl commands

To start a particular IdM service:

```
# systemctl start name.service
```

To stop a particular IdM service:

```
# systemctl stop name.service
```

To restart a particular IdM service:

```
# systemctl restart name.service
```

To view the status of a particular IdM service:

```
# systemctl status name.service
```

IMPORTANT

You cannot use the IdM web UI to start or stop the individual services running on IdM servers. You can only use the web UI to modify the settings of a Kerberized service by navigating to **Identity → Services** and selecting the service.

CHAPTER 3. INTRODUCTION TO THE IDM COMMAND-LINE UTILITIES

The following sections describe the basics of using the Identity Management (IdM) command-line utilities.

Prerequisites

- Installed and accessible IdM server.
  For details, see Installing Identity Management.
- To use the IPA command line interface, authenticate to IdM with a valid Kerberos ticket.
  For details about obtaining a valid Kerberos ticket, see Logging in to Identity Management from the command line.

3.1. WHAT IS THE IPA COMMAND LINE INTERFACE

The IPA command line interface (CLI) is the basic command-line interface for Identity Management (IdM) administration.

It supports a lot of subcommands that are used to manage IdM, such as the **ipa user-add** command to add a new user.

IPA CLI allows you to:

- Add, manage, or remove users, groups, hosts and other objects in the network.
- Manage certificates.
- Search entries.
- Display and list objects.
- Set access rights.
- Get help with the correct command syntax.

3.2. WHAT IS THE IPA HELP

The IPA help is a built-in documentation system for the IdM server.

IPA command line interface (CLI) generates available help topics from loaded IdM plugin modules. If you want to run the IPA help successfully, you need to:

- Have an IdM server installed and running.
- Be authenticated with a valid Kerberos ticket.

Executing the **ipa help** command without options displays information about basic help usage and the most common command examples.

Executing help with options has the following syntax:

```
$ ipa help [TOPIC | COMMAND | topics | commands]
```

- **[]** – Brackets mean that all parameters are optional and you can write just **ipa help** and the command will be executed.
- | – The pipe character means **or**. Therefore, you can use TOPIC or COMMAND or topics or commands with the basic **ipa help** command.
- **topics** – You can run the command **ipa help topics** and it will execute correctly. The command displays a list of topics that are covered by IPA help, for example, **user**, **cert**, **server** and many others.
- **TOPIC** – The **TOPIC** with capital letters means variable, therefore, you can use the particular topic, for example, **ipa help user**
- **commands** – You can run the command **ipa help commands** and it will execute correctly. The command displays a list of commands which are covered by the IPA help, for example, **user-add**, **ca-enable**, **server-show** and many others.
- **COMMAND** – The **COMMAND** with capital letters means variable, therefore, you can use the particular command, for example, **ipa help user-add**

3.3. USING IPA HELP TOPICS

The following procedure helps you to understand using the IPA help in the command line interface.

Procedure

1. Open terminal and connect to the IdM server.
2. Enter **ipa help topics** to display a list of topics covered by help.

```
$ ipa help topics
```

3. Select one of the topics and create a command according to the following pattern: **ipa help [topic_name]**, instead of the **topic_name** string, add one of the topics you listed in the previous step.
   In the example, we use the following topic: **user**

```
$ ipa help user
```

4. If the IPA help command is too long and you cannot see the whole text, use the following syntax:

```
$ ipa help user | less
```

   You can then scroll down and read the whole help.

The IPA CLI displays a help page for the **user** topic. After reading the overview, you can see many examples with patterns for working with topic commands.

3.4. USING IPA HELP COMMANDS

The following procedure helps you to understand creating the IPA help commands in the command line interface.

Procedure

1. Open terminal and connect to the IdM server.
2. Enter **ipa help commands** to display a list of commands covered by help.

```
$ ipa help commands
```

3. Select one of the commands and create a help command according to the following pattern: **ipa help <COMMAND>**, instead of the **<COMMAND>** string, add one of the commands you listed in the previous step.

```
$ ipa help user-add
```

Additional resources

- For details, see **man ipa** page.

3.5. STRUCTURE OF IPA COMMANDS

The IPA CLI distinguishes the following types of commands:

- Built-in commands – Built-in commands are all available in the IdM server.
- Plug-in provided commands

Structure of IPA commands allows you to manage various types of objects. For example:

- Users,
- Hosts,
- DNS records,
- Certificates,

and many others.

For most of these objects, the IPA CLI includes commands to:

- Add (**add**)
- Modify (**mod**)
- Delete (**del**)
- Search (**find**)
- Display (**show**)

Commands have the following structure:

ipa user-add, **ipa user-mod**, **ipa user-del**, **ipa user-find**, **ipa user-show**

ipa host-add, **ipa host-mod**, **ipa host-del**, **ipa host-find**, **ipa host-show**

ipa dnsrecord-add, **ipa dnsrecord-mod**, **ipa dnsrecord-del**, **ipa dnsrecord-find**, **ipa dnrecord-show**

You can create a user with the **ipa user-add [options]**, where **[options]** are optional. If you use just the **ipa user-add** command, the script asks you for details one by one.

To change an existing object, you need to define the object, therefore the command includes also object: **ipa user-mod USER_NAME [options]**.

3.6. USING AN IPA COMMAND TO ADD A USER ACCOUNT TO IDM

The following describes adding a new user to the Identity Management database using command line.

Prerequisites

- You need to have administrator privileges to add user accounts to the IdM server.

Procedure

1. Open terminal and connect to the IdM server.
2. Enter the command for adding a new user:

   ```
   $ ipa user-add
   ```

   The command runs a script where you can add basic data necessary for creating a user account.
3. In the **First name:** field, enter the first name of the new user and press the **Enter** key.
4. In the **Last name:** field, enter the last name of the new user and press the **Enter** key.
5. In the **User login [suggested user name]:**enter the user name or just press the **Enter** key if the suggested user name works for you.
   User name must be unique for the whole IdM database. If an error occurs, that the user already exists, you need to start from the beginning with the **ipa user-add** command and try a different user name.

After you successfully added the user name, the user account has been added to the IdM database and the IPA CLI prints on the output the following log:

```
----------------------
Added user "euser"
----------------------
User login: euser
First name: Example
Last name: User
Full name: Example User
Display name: Example User
Initials: EU
Home directory: /home/euser
GECOS: Example User
Login shell: /bin/sh
Principal name: euser@IDM.EXAMPLE.COM
Principal alias: euser@IDM.EXAMPLE.COM
Email address: euser@idm.example.com
UID: 427200006
GID: 427200006
```

```
Password: False
Member of groups: ipausers
Kerberos keys available: False
```

As you can see, a user password is not set to the user account. If you want to add also password, use the **ipa user-add** command in the following syntax:

```
$ ipa user-add --first=Example --last=User --password
```

The IPA CLI then asks you for adding or confirming a user name and password.

If the user has been already created, you can add only the password with the `ipa user-mod`command.

Additional resources

For more information about parameters, enter the following help command to the command line:

```
$ ipa help user-add
```

3.7. USING AN IPA COMMAND TO MODIFY A USER ACCOUNT IN IDM

You can change many parameters for each user account. For example, you can add a new password to the user.

Basic command syntax is different from the **user-add** syntax because you need to define the existing user account for which you want to perform changes, for example, add a password.

Prerequisites

- You need to have administrator privileges to modify user accounts in the IdM server.

Procedure

1. Open terminal and connect to the IdM server.
2. Enter the command for adding a password:

   ```
   $ ipa user-mod euser --password
   ```

   The command runs a script where you can add the new password.
3. Enter the new password and press the **Enter** key.

After you successfully added the user name, the user account has been added to the IdM database and the IPA CLI prints on the output the following log:

```
----------------------
Modified user "euser"
----------------------
User login: euser
First name: Example
Last name: User
Home directory: /home/euser
Principal name: euser@IDM.EXAMPLE.COM
Principal alias: euser@IDM.EXAMPLE.COM
Email address: euser@idm.example.com
```

```
UID: 427200006
GID: 427200006
Password: True
Member of groups: ipausers
Kerberos keys available: True
```

The user password is now set for the account and the user can log into IdM.

Additional resources

For more information about parameters, enter the following help command to the command line:

```
$ ipa help user-mod
```

3.8. HOW TO SUPPLY A LIST OF VALUES TO THE IDM UTILITIES

Identity Management (IdM) stores values for multi-valued attributes in lists.

IdM supports the following methods of supplying multi-valued lists:

- Using the same command-line argument multiple times within the same command invocation:

  ```
  $ ipa permission-add --right=read --permissions=write --permissions=delete ...
  ```

- Alternatively, you can enclose the list in curly braces, in which case the shell performs the expansion:

  ```
  $ ipa permission-add --right={read,write,delete} ...
  ```

Examples above show a command **permission-add** which adds permissions to an object. The object is not mentioned in the example. Instead of **...** you need to add the object for which you want to add permissions.

When you update such multi-valued attributes from the command line, IdM completely overwrites the previous list of values with a new list. Therefore, when updating a multi-valued attribute, you must specify the whole new list, not just a single value you want to add.

In the command above, the list of permissions includes reading, writing and deleting. When you decide to update the list with the **permission-mod** command, you must add all values, otherwise those not mentioned will be deleted.

Example 1: – The **ipa permission-mod** command updates all previously added permissions.

```
$ ipa permission-mod --right=read --right=write --right=delete ...
```

or

```
$ ipa permission-mod --right={read,write,delete} ...
```

Example 2 – The **ipa permission-mod** command deletes the **--right=delete** argument because it is not included in the command:

```
$ ipa permission-mod --right=read --right=write ...
```

or

```
$ ipa permission-mod --right={read,write} ...
```

3.9. HOW TO USE SPECIAL CHARACTERS WITH THE IDM UTILITIES

When passing command-line arguments that include special characters to the **ipa** commands, escape these characters with a backslash (\). For example, common special characters include angle brackets (< and >), ampersand (&), asterisk (*), or vertical bar (|).

For example, to escape an asterisk (*):

```
$ ipa certprofile-show certificate_profile --out=exported\*profile.cfg
```

Commands containing unescaped special characters do not work as expected because the shell cannot properly parse such characters.

CHAPTER 4. SEARCHING IDENTITY MANAGEMENT ENTRIES FROM THE COMMAND LINE

The following sections describe how to use IPA commands, which helps you to find or show objects.

4.1. OVERVIEW OF LISTING IDM ENTRIES

This section describes the **ipa *-find** commands, which can help you to search for a particular type of IdM entries.

To list all the **find** commands, use the following ipa help command:

```
$ ipa help commands | grep find
```

You may need to check if a particular user is included in the IdM database. You can then list all users with the following command:

```
$ ipa user-find
```

To list user groups whose specified attributes contain a keyword:

```
$ ipa group-find keyword
```

For example the **ipa group-find *admin*** command lists all groups whose names or descriptions include string **admin**:

```
----------------
3 groups matched
----------------
  Group name: admins
  Description: Account administrators group
  GID: 427200002

  Group name: editors
  Description: Limited admins who can edit other users
  GID: 427200002

  Group name: trust admins
  Description: Trusts administrators group
```

When searching user groups, you can also limit the search results to groups that contain a particular user:

```
$ ipa group-find --user=user_name
```

To search for groups that do not contain a particular user:

```
$ ipa group-find --no-user=user_name
```

4.2. SHOWING DETAILS FOR A PARTICULAR ENTRY

Use the **ipa *-show** command to display details about a particular IdM entry.

Procedure

- To display details about a host named *server.example.com*:

```
$ ipa host-show server.example.com

Host name: server.example.com
Principal name: host/server.example.com@EXAMPLE.COM
...
```

4.3. ADJUSTING THE SEARCH SIZE AND TIME LIMIT

Some queries, such as requesting a list of IdM users, can return a very large number of entries. By tuning these search operations, you can improve the overall server performance when running the **ipa *-find** commands, such as **ipa user-find**, and when displaying corresponding lists in the Web UI.

Search size limit

Defines the maximum number of entries returned for a request sent to the server from a client's CLI or from a browser accessing the IdM Web UI.
Default: 100 entries.

Search time limit

Defines the maximum time (in seconds) that the server waits for searches to run. Once the search reaches this limit, the server stops the search and returns the entries discovered in that time.
Default: 2 seconds.

If you set the values to **-1**, IdM will not apply any limits when searching.

IMPORTANT

Setting search size or time limits too high can negatively affect server performance.

4.3.1. Adjusting the search size and time limit in the command line

The following text describes adjusting search size and time limits in the command line:

- Globally
- For a specific entry

Procedure

1. To display current search time and size limits in CLI, use the ipa config-show command:

```
$ ipa config-show

Search time limit: 2
Search size limit: 100
```

2. To adjust the limits globally for all queries, use the **ipa config-mod** command and add the **--searchrecordslimit** and **--searchtimelimit** options. For example:

```
$ ipa config-mod --searchrecordslimit=500 --searchtimelimit=5
```

3. To adjust the limits only for a specific query, add the **--sizelimit** or **--timelimit** options to the command. For example:

```
$ ipa user-find --sizelimit=200 --timelimit=120
```

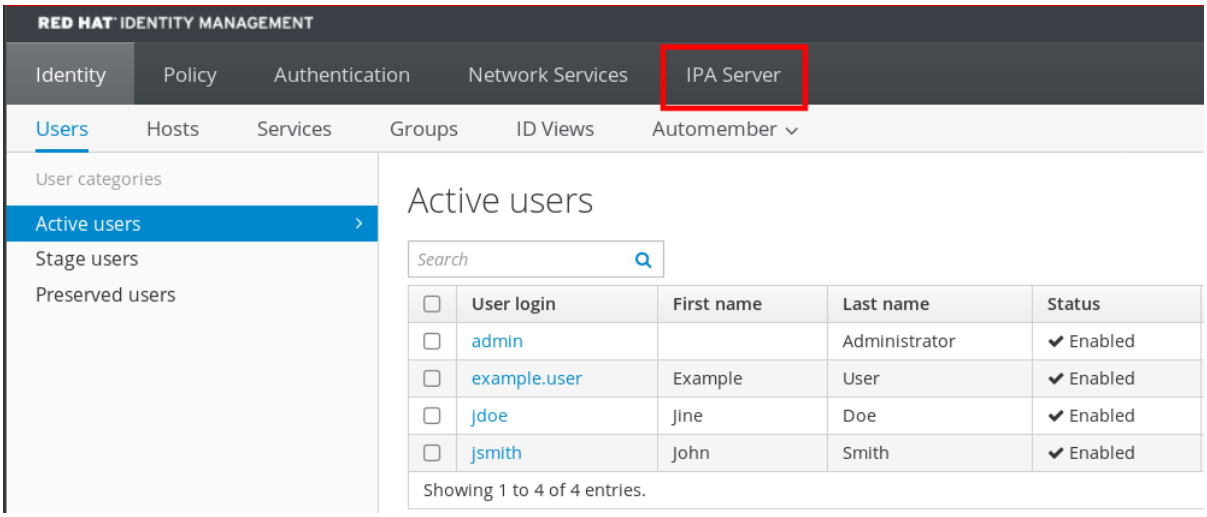
4.3.2. Adjusting the search size and time limit in the Web UI

The following text describes adjusting search size and time limits in the IdM Web UI:

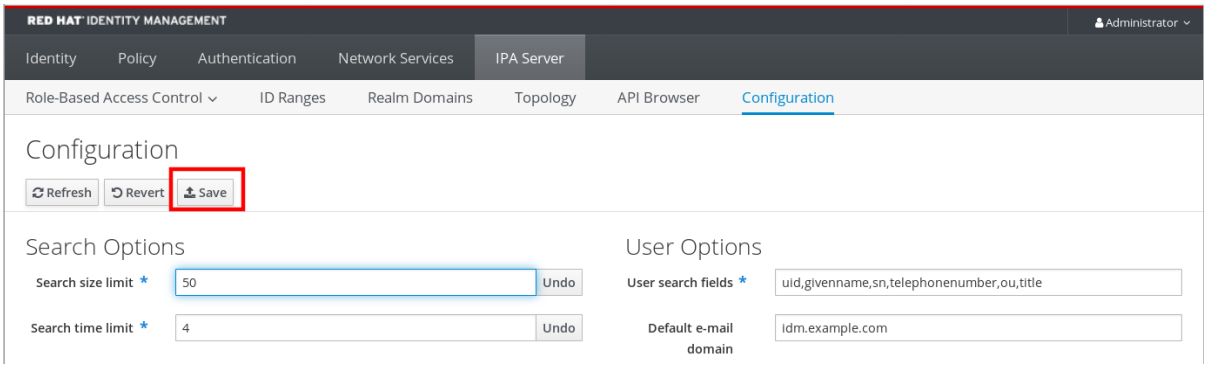
- Globally
- For a specific entry

Procedure
To adjust the limits globally for all queries:

1. Log in to the IdM Web UI.
2. Click **IPA Server**.



3. On the **IPA Server** tab, click **Configuration**.
4. Set the required values in the **Search Options** area.
   Default values are:
   - Search size limit: 100 entries
   - Search time limit: 2 seconds
5. Click **Save** at the top of the page.



After saving the values, search an entry and verify the result.

CHAPTER 5. ACCESSING THE IDM WEB UI IN A WEB BROWSER

The following sections provide an overview of the IdM (Identity Management) Web UI and describe how to access it.

5.1. WHAT IS THE IDM WEB UI

The IdM (Identity Management) Web UI is a web application for IdM administration, a graphical alternative to the IdM command line tools.

You can access the IdM Web UI as:

- **IdM users:** A limited set of operations depending on permissions granted to the user in the IdM server. Basically, active IdM users can log in to the IdM server and configure their own account. They cannot change settings of other users or the IdM server settings.
- **Administrators:** Full access rights to the IdM server.
- **Active Directory users:** A limited set of operations depending on permissions granted to the user.
  Active Directory users cannot be administrators for Identity Management.

5.2. WEB BROWSERS SUPPORTED FOR ACCESSING THE WEB UI

IdM (Identity Management) supports the following browsers for connecting to the Web UI:

- Mozilla Firefox 38 and later
- Google Chrome 46 and later

5.3. ACCESSING THE WEB UI

The following procedure describes the first logging in to the IdM (Identity Management) Web UI with a password.

After the first login you can configure your IdM server to authenticate with:

- Kerberos ticket
  For details, see Section 6.2, “Kerberos authentication in Identity Management” .
- Smart card
  For details, see Section 9.1, “Configuring the IdM server for smart card authentication” .
- One time password (OTP) – this can be combined with password and Kerberos authentication.
  For details, see Section 7.2, “One time password (OTP) authentication in Identity Management” .

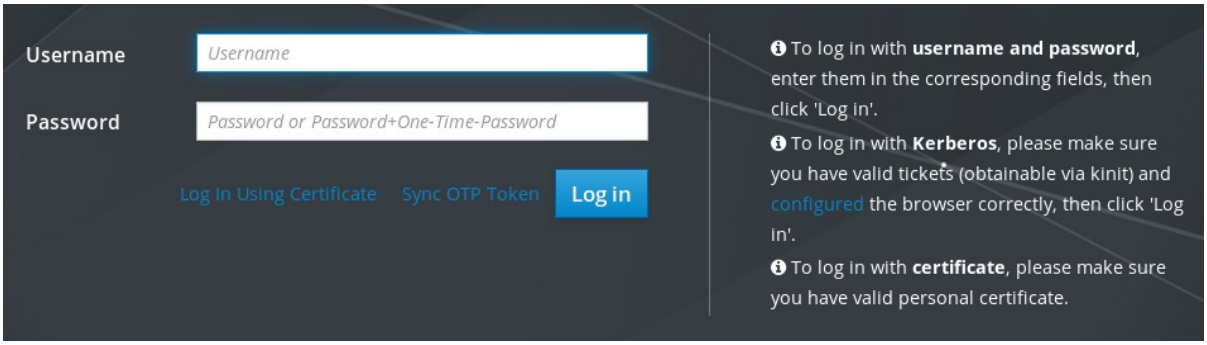
Procedure

1. Type an IdM server URL into the browser address bar. The name will look similarly to the following example:

```
https://server.example.com
```

You just need to change **server.example.com** with a DNS name of your IdM server.

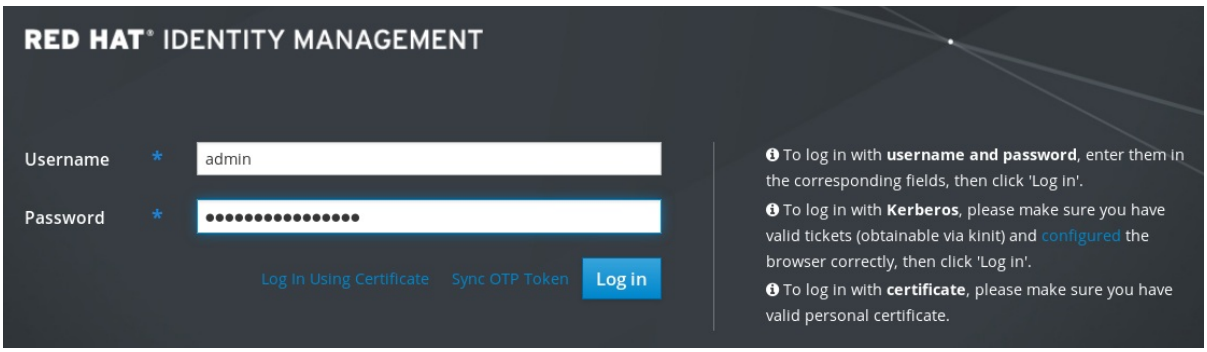
This opens the IdM Web UI login screen in your browser.



- If the server does not respond or the login screen does not open, check the DNS settings on the IdM server to which you are connecting.
- If you use a self-signed certificate, the browser issues a warning. Check the certificate and accept the security exception to proceed with the login.
  To avoid security exceptions, install a certificate signed by a certificate authority.

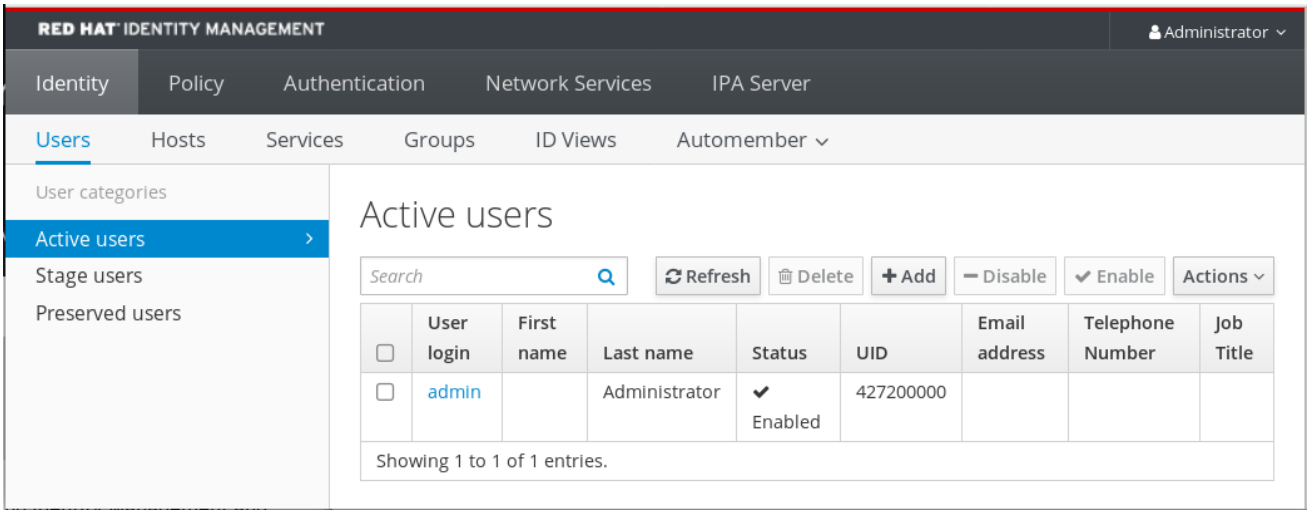
2. On the Web UI login screen, enter the administrator account credentials you added during the IdM server installation.
   For details, see Installing an Identity Management server: With integrated DNS, with an integrated CA.

   You can enter your personal account credentials as well if they are already entered in the IdM server.



3. Click **Log in**.

After the successful login, you can start configuring the IdM server.


RED HAT IDENTITY MANAGEMENT
Administrator
Identity
Policy
Authentication
Network Services
IPA Server
Users
Hosts
Services
Groups
ID Views
Automember
User categories
Active users
Stage users
Preserved users
Active users
Search
Refresh
Delete
Add
Disable
Enable
Actions
User login
First name
Last name
Status
UID
Email address
Telephone Number
Job Title
admin
Administrator
Enabled
427200000
Showing 1 to 1 of 1 entries.

CHAPTER 6. LOGGING IN TO IDM IN THE WEB UI: USING A KERBEROS TICKET

The following sections describe the initial configuration of your environment to enable Kerberos login to the IdM Web UI and accessing IdM using Kerberos authentication.

6.1. PREREQUISITES

- Installed IdM server in your network environment
  For details, see Installing Identity Management in Red Hat Enterprise Linux 8

6.2. KERBEROS AUTHENTICATION IN IDENTITY MANAGEMENT

Identity Management (IdM) uses the Kerberos protocol to support single sign-on. Single sign-on authentication allows you to provide the correct user name and password only once, and you can then access Identity Management services without the system prompting for credentials again.

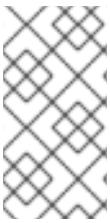
The IdM server provides Kerberos authentication immediately after the installation if the DNS and certificate settings have been configured properly. For details, see Installing Identity Management .

To use Kerberos authentication on hosts, install:

- the IdM client
  For details, see Preparing the system for Identity Management client installation .
- the krb5conf package

6.3. USING KINIT TO LOG IN TO IDM MANUALLY

This procedure describes using the **kinit** utility to authenticate to an Identity Management (IdM) environment manually. The **kinit** utility obtains and caches a Kerberos ticket-granting ticket (TGT) on behalf of an IdM user.



NOTE

Only use this procedure if you have destroyed your initial Kerberos TGT or if it has expired. As an IdM user, when logging onto your local machine you are also automatically logging in to IdM. This means that after logging in, you are not required to use the **kinit** utility to access IdM resources.

Procedure

1. To log in to IdM
   - under the user name of the user who is currently logged in on the local system, use **kinit** without specifying a user name. For example, if you are logged in as **example_user** on the local system:

     ```
     [example_user@server ~]$ kinit
     Password for example_user@EXAMPLE.COM:
     [example_user@server ~]$
     ```

If the user name of the local user does not match any user entry in IdM, the authentication attempt fails:

```
[example_user@server ~]$ kinit
kinit: Client 'example_user@EXAMPLE.COM' not found in Kerberos database while
getting initial credentials
```

- using a Kerberos principal that does not correspond to your local user name, pass the required user name to the **kinit** utility. For example, to log in as the **admin** user:

```
[example_user@server ~]$ kinit admin
Password for admin@EXAMPLE.COM:
[example_user@server ~]$
```

2. Optionally, to verify that the login was successful, use the **klist** utility to display the cached TGT. In the following example, the cache contains a ticket for the **example_user** principal, which means that on this particular host, only **example_user** is currently allowed to access IdM services:

```
$ klist
Ticket cache: KEYRING:persistent:0:0
Default principal: example_user@EXAMPLE.COM

Valid starting      Expires             Service principal
11/10/2019 08:35:45   11/10/2019 18:35:45   krbtgt/EXAMPLE.COM@EXAMPLE.COM
```

6.4. CONFIGURING THE BROWSER FOR KERBEROS AUTHENTICATION

To enable authentication with a Kerberos ticket, you may need a browser configuration.

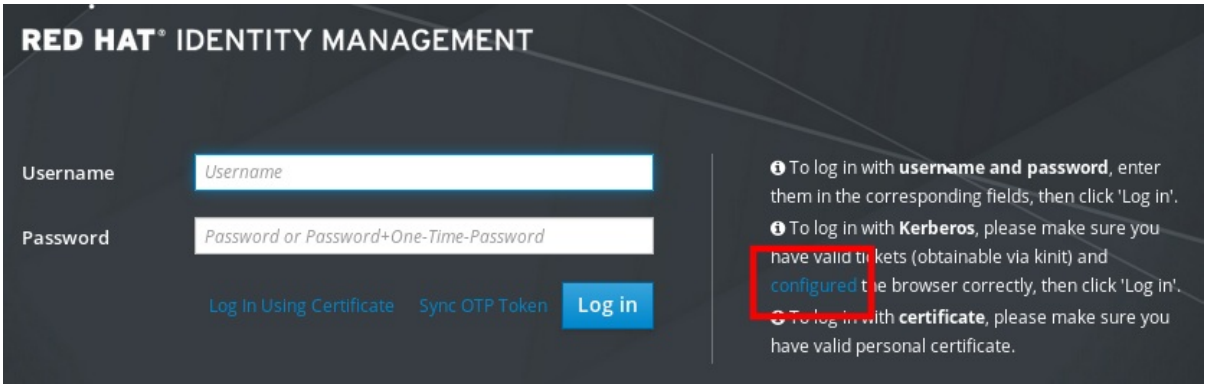
The following steps help you to support Kerberos negotiation for accessing the IdM domain.

Each browser supports Kerberos in a different way and needs different set up. The IdM Web UI includes guidelines for the following browsers:

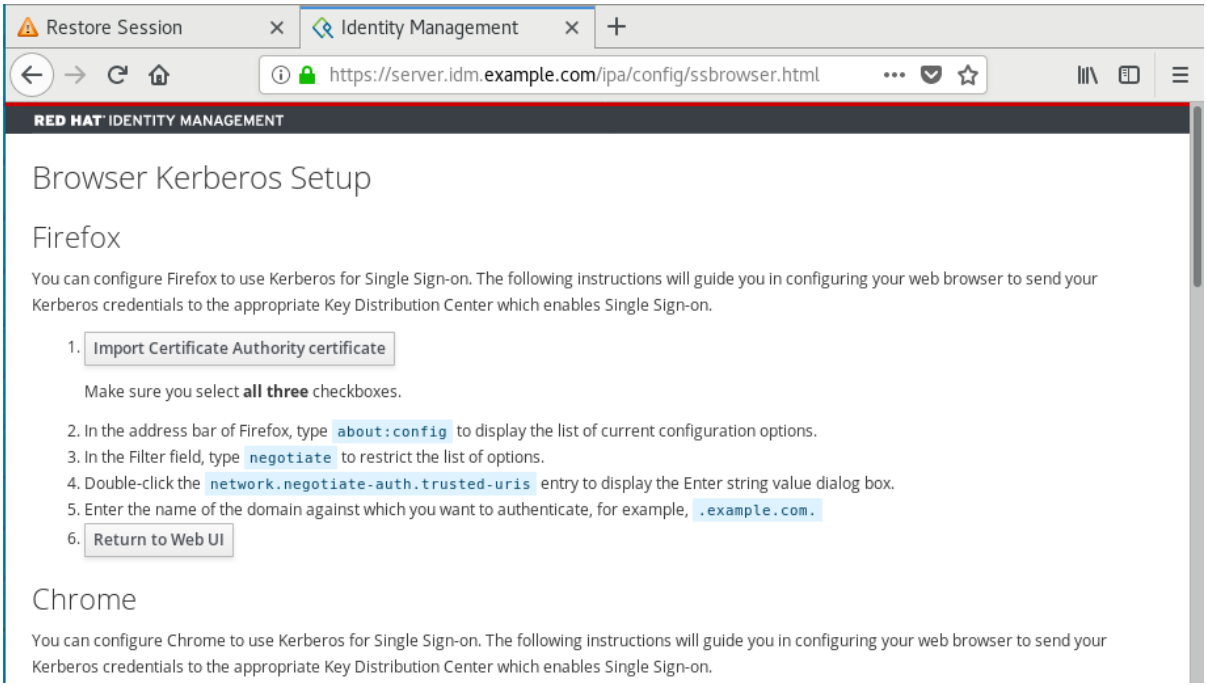
- Firefox
- Chrome

Procedure

1. Open the IdM Web UI login dialog in your web browser.
2. Click the link for browser configuration on the Web UI login screen.



3. Follow the steps on the configuration page.



After the setup, turn back to the IdM Web UI and click **Log in**.

6.5. LOGGING IN TO THE WEB UI USING A KERBEROS TICKET

This procedure describes logging in to the IdM Web UI using a Kerberos ticket-granting ticket (TGT).

The TGT expires at a predefined time. The default time interval is 24 hours and you can change it in the IdM Web UI.

After the time interval expires, you need to renew the ticket:

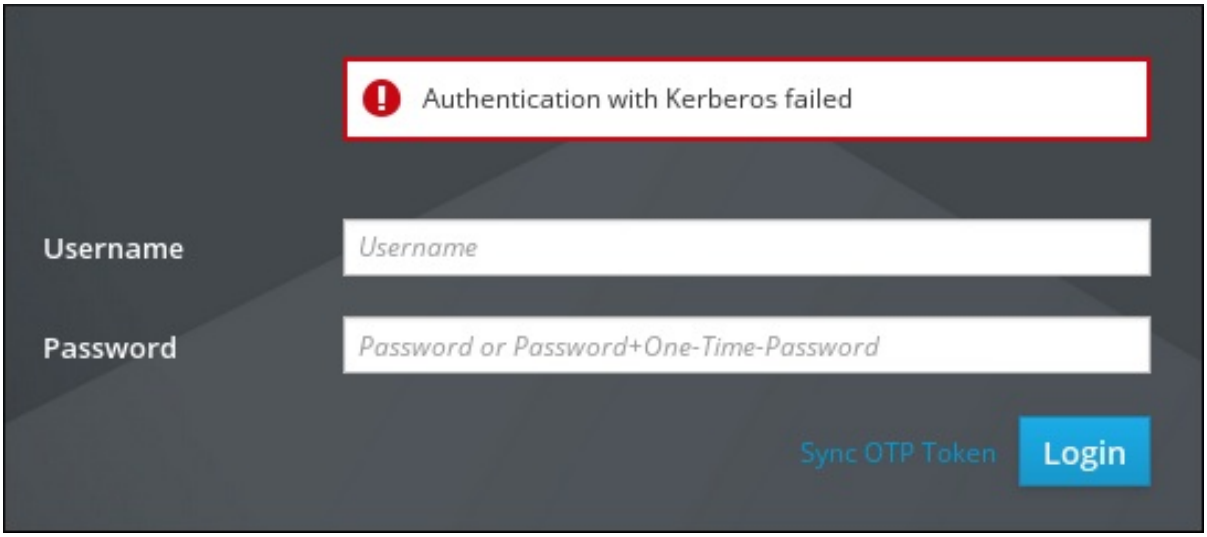
- Using the kinit command.
- Using IdM login credentials in the Web UI login dialog.

Procedure

- Open the IdM Web UI.
  If Kerberos authentication works correctly and you have a valid ticket, you will be automatically authenticated and the Web UI opens.

  If the ticket is expired, it is necessary to authenticate yourself with credentials first. However, next time the IdM Web UI will open automatically without opening the login dialog.

If you see an error message **Authentication with Kerberos failed**, verify that your browser is configured for Kerberos authentication. See Section 6.4, "Configuring the browser for Kerberos authentication".



6.6. CONFIGURING AN EXTERNAL SYSTEM FOR KERBEROS AUTHENTICATION

This section describes how to configure an external system so that Identity Management (IdM) users can log in to IdM from the external system using their Kerberos credentials.

Enabling Kerberos authentication on external systems is especially useful when your infrastructure includes multiple realms or overlapping domains. It is also useful if the system has not been enrolled into any IdM domain through **ipa-client-install**.

To enable Kerberos authentication to IdM from a system that is not a member of the IdM domain, define an IdM-specific Kerberos configuration file on the external system.

Prerequisites

- The **krb5-workstation** package is installed on the external system.
  To find out whether the package is installed, use the following CLI command:

```
# yum list installed krb5-workstation
Installed Packages
krb5-workstation.x86_64    1.16.1-19.el8    @BaseOS
```

Procedure

1. Copy the **/etc/krb5.conf** file from the IdM server to the external system. For example:

```
# scp /etc/krb5.conf root@externalsystem.example.com:/etc/krb5_ipa.conf
```

WARNING

Do not overwrite the existing **krb5.conf** file on the external system.

2. On the external system, set the terminal session to use the copied IdM Kerberos configuration file:

```
$ export KRB5_CONFIG=/etc/krb5_ipa.conf
```

   The **KRB5_CONFIG** variable exists only temporarily until you log out. To prevent this loss, export the variable with a different file name.

3. Copy the Kerberos configuration snippets from the **/etc/krb5.conf.d/** directory to the external system.

4. Configure the browser on the external system, as described in Section 6.4, "Configuring the browser for Kerberos authentication".

Users on the external system can now use the **kinit** utility to authenticate against the IdM server.

6.7. WEB UI LOGIN FOR ACTIVE DIRECTORY USERS

To enable Web UI login for Active Directory users, define an ID override for each Active Directory user in the default trust view. For example:

```
[admin@server ~]$ ipa idoverrideuser-add 'Default Trust View' ad_user@ad.example.com
```

CHAPTER 7. LOGGING IN TO THE IDENTITY MANAGEMENT WEB UI USING ONE TIME PASSWORDS

Access to IdM Web UI can be secured using several methods. The basic one is password authentication.

To increase the security of password authentication, you can add a second step and require automatically generated one-time passwords (OTPs). The most common usage is to combine password connected with the user account and a time limited one time password generated by a hardware or software token.

The following sections help you to:

- Understand how the OTP authentication works in IdM.
- Configure OTP authentication on the IdM server.
- Create OTP tokens and synchronize them with the FreeOTP app in your phone.
- Authenticate to the IdM Web UI with the combination of user password and one time password.
- Re-synchronize tokens in the Web UI.

7.1. PREREQUISITES

- Accessing the IdM Web UI in a web browser

7.2. ONE TIME PASSWORD (OTP) AUTHENTICATION IN IDENTITY MANAGEMENT

One-time passwords bring an additional step to your authentication security. The authentication uses your password + an automatically generated one time password.

To generate one time passwords, you can use a hardware or software token. IdM supports both software and hardware tokens.

Identity Management supports the following two standard OTP mechanisms:

- The HMAC-Based One-Time Password (HOTP) algorithm is based on a counter. HMAC stands for Hashed Message Authentication Code.
- The Time-Based One-Time Password (TOTP) algorithm is an extension of HOTP to support time-based moving factor.

IMPORTANT

IdM does not support OTP logins for Active Directory trust users.

7.3. ENABLING THE ONE TIME PASSWORD IN THE WEB UI

> The IdM Web UI allows you to configure hardware or software device to generate one-time passwords.

The one time password is entered just after the usual password in the dedicated field in the login dialog.

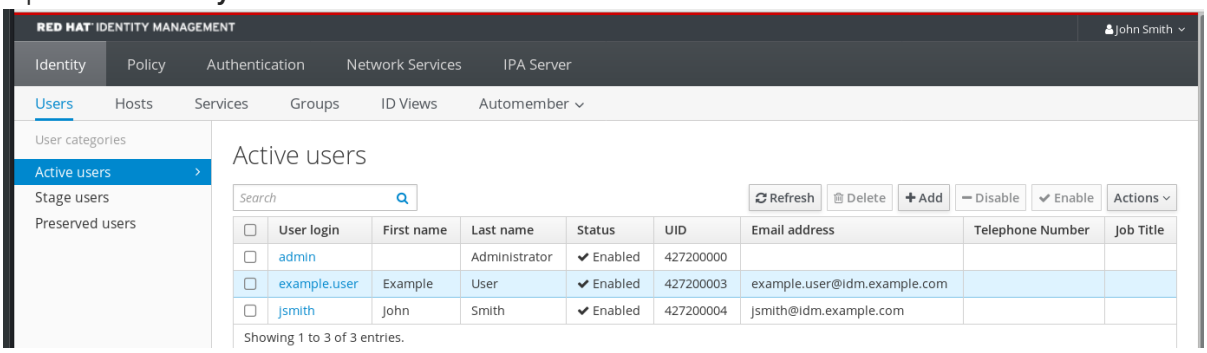
Only administrators can enable OTP authentication in the user settings.

Prerequisites

- Administration privileges

Procedure

1. Log in to the IdM Web UI with your username and password.
2. Open the **Identity → Users → Active users**tab.



3. Click your username to open the user settings.
4. In the **User authentication types**, select **Two factor authentication (password + OTP)**.
5. Click **Save**.

At this point, the OTP authentication is enabled on the IdM server.

Now you or users themselves need to assign a new token ID to the user account.

7.4. ADDING OTP TOKENS IN THE WEB UI

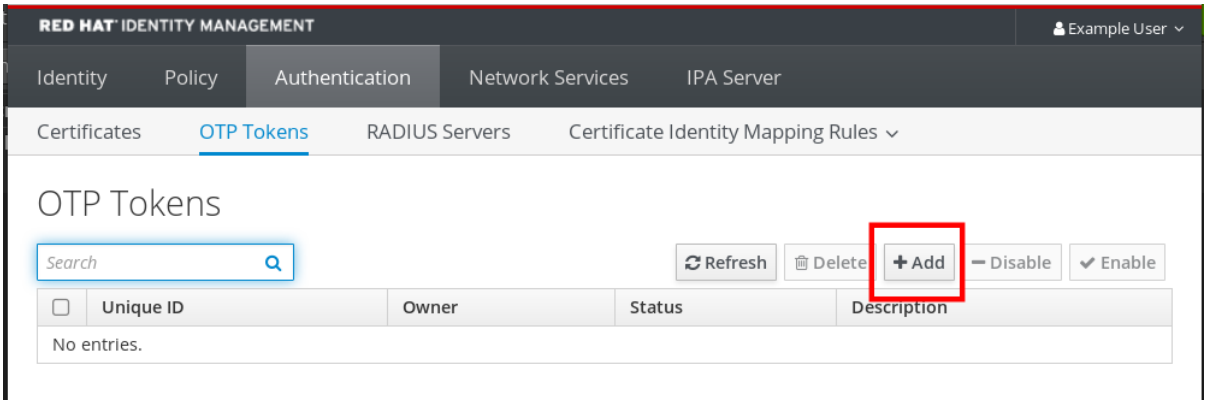
The following section helps you to add token to the IdM Web UI and to your software token generator.

Prerequisites

- Active user account on the IdM server.
- Administrator has enabled OTP for the particular user account in the IdM Web UI.
- A software device generating OTP tokens, for example FreeOTP.

Procedure

1. Log in to the IdM Web UI with your user name and password.
2. To create the token in your mobile phone, open the **Authentication → OTP Tokens**tab.
3. Click **Add**.

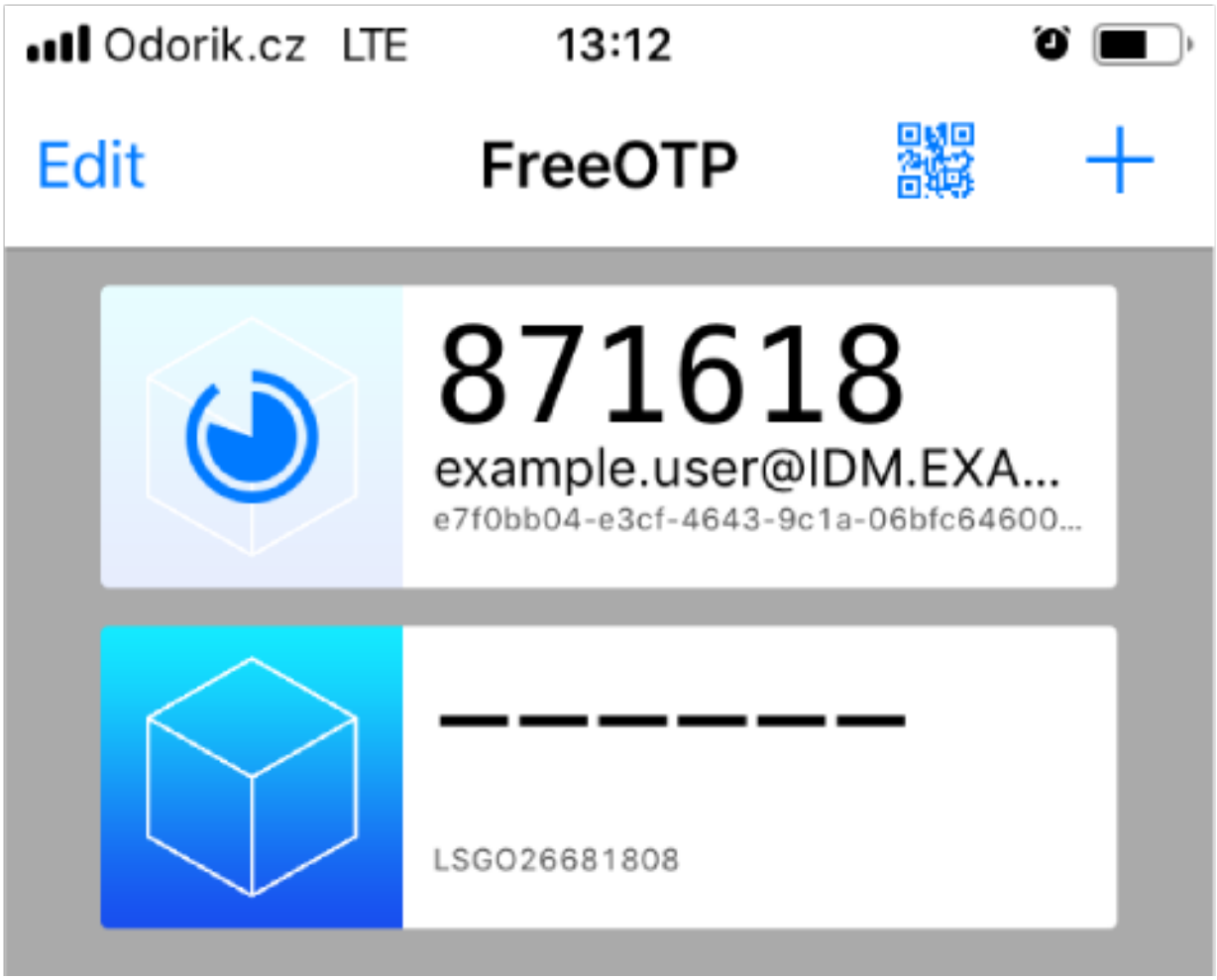


4. In the **Add OTP token** dialog box, leave everything unfilled and click **Add**.
   At this stage, the IdM server creates a token with default parameters at the server and opens a page with a QR code.

5. Copy the QR code into your mobile phone.

6. Click **OK** to close the QR code.

Now you can generate one time passwords and log in with them to the IdM Web UI.



7.5. LOGGING INTO THE WEB UI WITH A ONE TIME PASSWORD

This procedure describes the first login into the IdM Web UI using a one time password (OTP).

Prerequisites

- OTP configuration enabled on the Identity Management server for the user account you are using for the OTP authentication. Administrators as well as users themselves can enable OTP. To enable the OTP configuration, see Section 7.3, "Enabling the one time password in the Web UI"
- A hardware or software device generating OTP tokens configured.

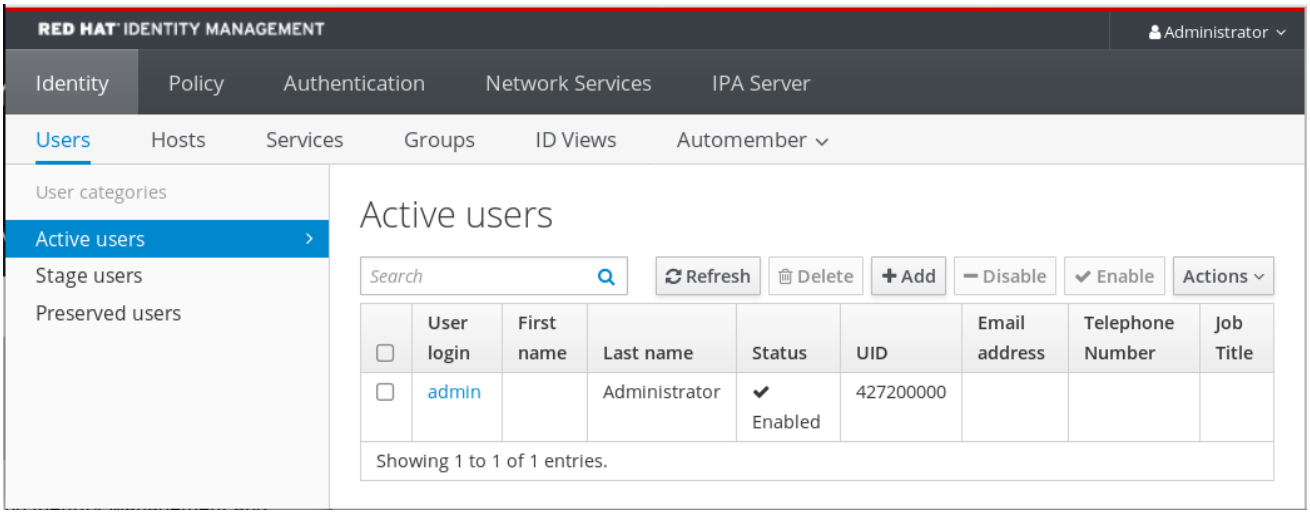
Procedure

1. In the Identity Management login screen, enter your user name or a user name of the IdM server adminisntrator account.
2. Add the password for the user name entered above.
3. Generate a one time password on your device.
4. Enter the one time password right after the password (without space).
5. Click **Log in**.
   If the authentication fails, synchronize OTP tokens.

   If your CA uses a self-signed certificate, the browser issues a warning. Check the certificate and accept the security exception to proceed with the login.

   If the the IdM Web UI does not open, verify the DNS configuration of your Identity Management server.

After successful login, the IdM Web UI appears.



7.6. SYNCHRONIZING OTP TOKENS USING THE WEB UI

If the login with OTP (One Time Password) fails, OTP tokens are not synchronized correctly.

The following text describes token re-synchronization.

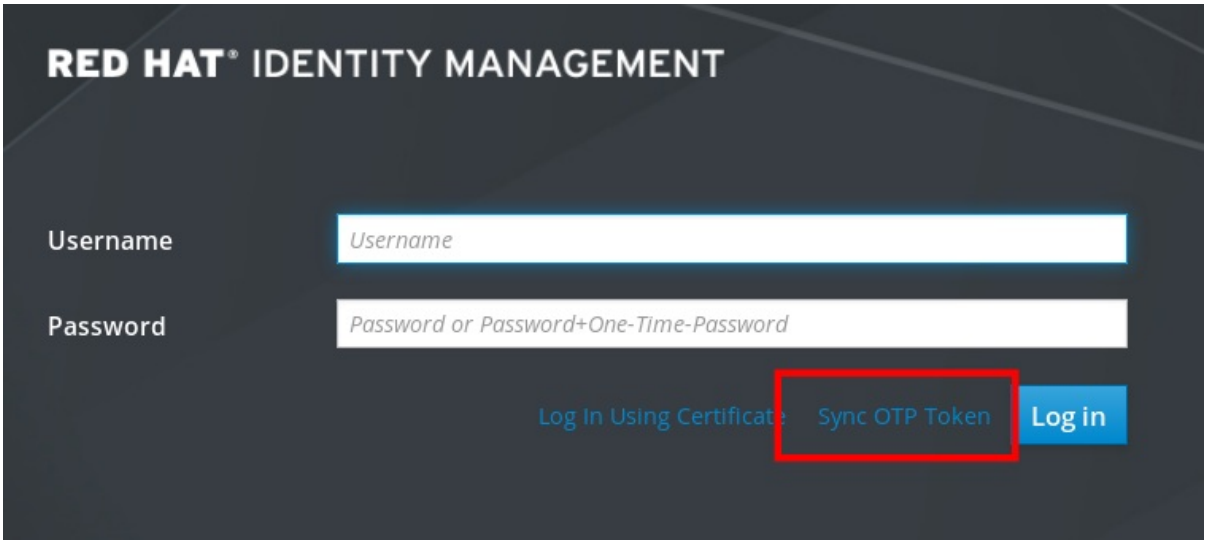
Prerequisites

- A login screen opened.

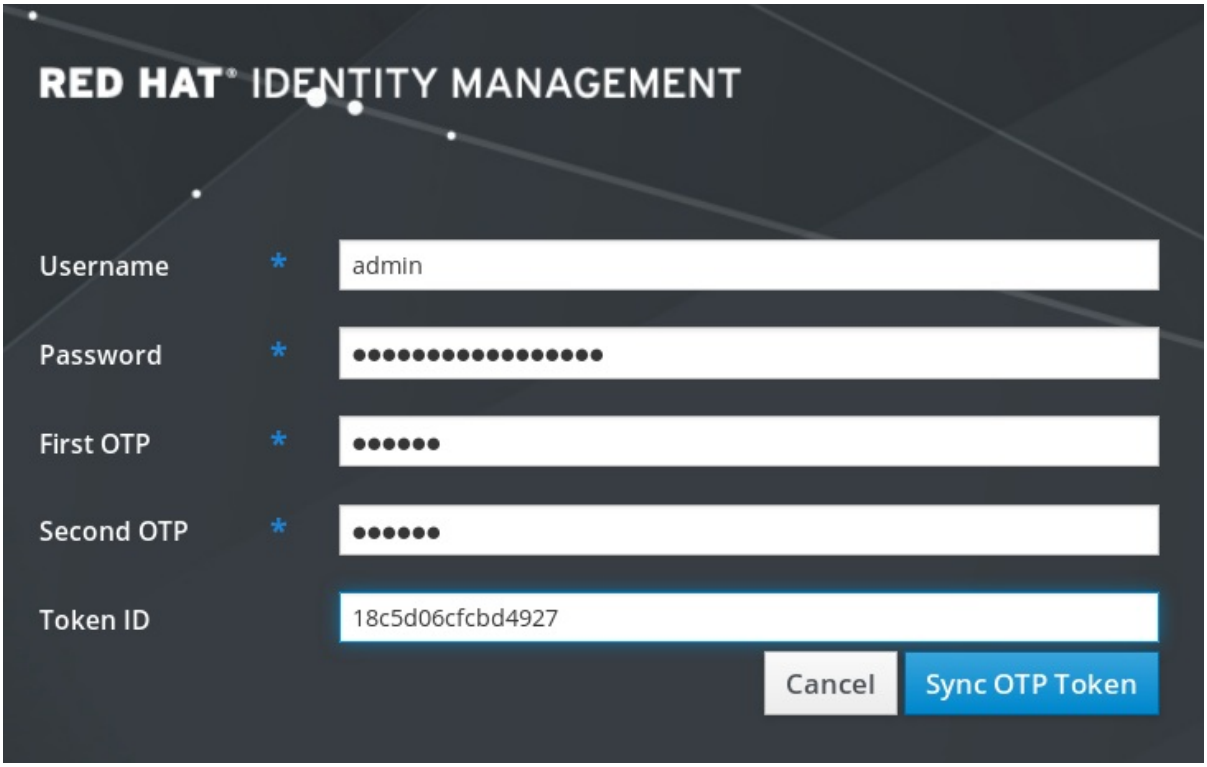
- A device generating OTP tokens configured.

Procedure

1. On the IdM Web UI login screen, click **Sync OTP Token**.



2. In the login screen, enter your username and the Identity Management password.
3. Generate one time password and enter it in the **First OTP** field.
4. Generate another one time password and enter it in the **Second OTP** field.
5. Optionally, enter the token ID.



6. Click **Sync OTP Token**.

After the successful synchronization, you can log in to the IdM server.

7.7. CHANGING EXPIRED PASSWORDS

Administrators of Identity Management can enforce you having to change your password at the next login. It means that you cannot successfully log in to the IdM Web UI until you change the password.

Password expiration can happen during your first login to the Web UI.

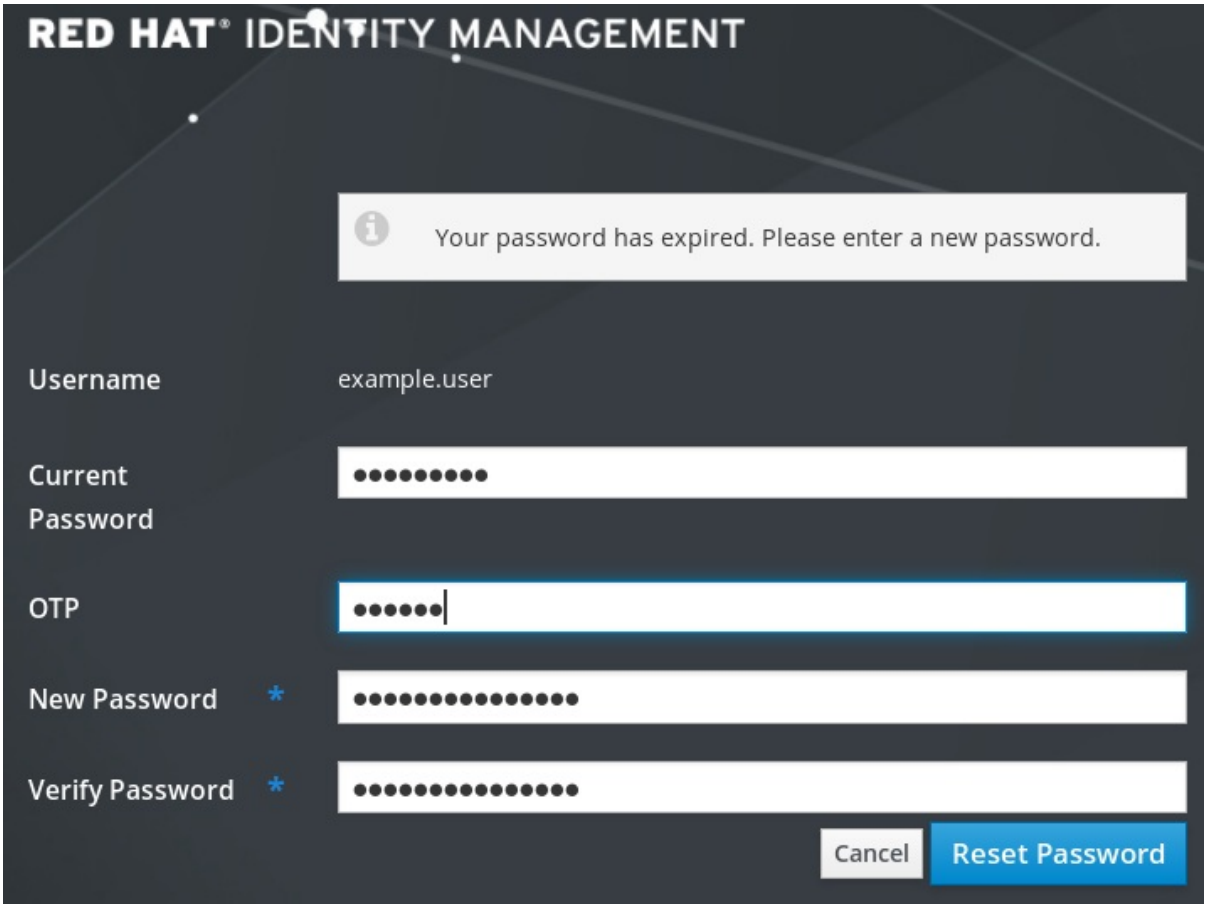
If the expiration password dialog appears, follow the instructions in the procedure.

Prerequisites

- A login screen opened.
- Active account to the IdM server.

Procedure

1. In the password expiration login screen, enter the user name.
2. Add the password for the user name entered above.
3. In the OTP field, generate a one time password, if you use the one time password authentication.
   If you do not have enabled the OTP authentication, leave the field empty.
4. Enter the new password twice for verification.
5. Click **Reset Password**.



After the successful password change, the usual login dialog displays. Log in with the new password.

CHAPTER 8. PUBLIC KEY CERTIFICATES IN IDENTITY MANAGEMENT

This chapter introduces X.509 public key certificates, which are used to authenticate users, hosts and services in Identity Management (IdM). In addition to authentication, X.509 certificates also enable digital signing and encryption to provide privacy, integrity and non-repudiation.

A certificate contains information about

- the subject that the certificate authenticates
- who has signed (validated) the certificate, that is the issuer
- the start and end of the validity of the certificate
- the valid uses of the certificate
- the public key of the subject

A message encrypted by the public key can only be decrypted by a corresponding private key. Although a certificate and the public key it includes can be made freely available, a user, host or machine must keep their private key secret.

8.1. CERTIFICATE AUTHORITIES IN IDM

Certificate authorities operate in a hierarchy of trust. In an IdM environment with an internal Certificate Authority (CA), all the IdM hosts, users and services trust certificates that have been signed by the CA. Apart from this root CA, IdM supports sub-CAs to which the root CA has granted the ability to sign certificates in their turn. Frequently, the certificates that such sub-CAs are able to sign are certificates of a specific kind, for example VPN certificates.

From the certificate point of view, there is no difference between being signed by a self-signed IdM CA and being signed externally.

The role of the CA is the following:

- It issues and verifies digital certificates
- It signs the certificate to prove that the certificate belongs to the user, host or service that presents it
- In an IdM environment with an internal CA, the CA which is the Certificate Renewal Master and which maintains the Certificate Revocation List (CRL) is the highest authority

8.2. COMPARISON OF CERTIFICATES AND KERBEROS

Certificates perform a similar function to that performed by Kerberos tickets. Kerberos is a computer network authentication protocol that works on the basis of tickets to allow nodes communicating over a non-secure network to prove their identity to one another in a secure manner. The following table shows a comparison of Kerberos and X.509 certificates:

Table 8.1. Comparison of certificates and Kerberos

Characteristic	Kerberos	X.509

Authentication	Yes	Yes
Privacy	Optional	Yes
Integrity	Optional	Yes
Type of cryptography involved	Symmetrical	Asymmetrical
Default validity	Short (1 day)	Long(2 years)

By default, Kerberos in Identity Management only ensures the identity of the communicating parties.

8.3. THE PROS AND CONS OF USING CERTIFICATES TO AUTHENTICATE USERS IN IDM

The advantages of using certificates to authenticate users in IdM include:

- A PIN that protects the private key on a smart card is typically less complex and easier to remember than a regular password.
- Depending on the device, a private key stored on a smart card cannot be exported. This provides additional security.
- Smart cards can make logout automatic: IdM can be configured to log out users when they remove the smart card from the reader.
- Stealing the private key requires actual physical access to a smart card, making smart cards secure against hacking attacks.
- Smart card authentication is two-factor authentication: it requires both something you have (the card) and something you know (the PIN).
- Smart cards are more flexible than passwords because they provide the keys that can be used for other purposes, such as encrypting email.
- Using smart cards use on shared machines that are IdM clients does not typically pose additional configuration problems for system administrators. In fact, smart card authentication is an ideal choice for shared machines.

The disadvantages of using certificates to authenticate users in IdM include:

- Users might lose or forget to bring their smart card or certificate and be effectively locked out.
- Mistyping a PIN multiple times might result in a card becoming locked.
- There is generally an intermediate step between request and authorization by some sort of security officer or approver. In IdM, the security officer or administrator must run the **ipa cert-request** command.
- Smart cards and readers tend to be vendor and driver specific: although a lot of readers can be used for different cards, a smart card of a specific vendor might not work in the reader of another vendor or in the type of a reader for which it was not designed.

- The learning curve to certificates and smart cards might seem daunting to admininstrators with no experience in the area.

CHAPTER 9. CONFIGURING IDENTITY MANAGEMENT FOR SMART CARD AUTHENTICATION

Authentication based on smart cards is an alternative to passwords. User credentials are stored on the smart card in the form of a private key and a certificate, and special software and hardware is used to access them. The user places the smart card into a reader or a USB socket and supplies the PIN code for the smart card instead of providing his login and password.

Identity Management (IdM) supports smart card authentication with:

- User certificates issued by the IdM certificate authority
- User certificates issued by an external certificate authority

This user story shows how to set up smart card authentication in IdM for both types of certificates. In the user story, the **smartcard_ca.pem** CA certificate is the file containing the certificate of a trusted external certificate authority.

The user story contains the following modules:

Section 9.1, “Configuring the IdM server for smart card authentication”

Section 9.2, “Configuring the IdM client for smart card authentication”

Section 9.3, “Adding a certificate to a user entry in IdM”

Section 9.4, “Configuring the browser for smart card authentication”

Section 9.5, “Logging in to IdM with smart cards”

9.1. CONFIGURING THE IDM SERVER FOR SMART CARD AUTHENTICATION

If you want to enable smart card authentication for users whose certificates have been issued by the certificate authority of the **EXAMPLE.ORG** domain, whose LDAP distinguished name (DN) is **CN=Certificate Authority,DC=EXAMPLE,DC=COM**, then you need to obtain the certificate of the authority so that you can run it with the script configuring the IdM server. You can, for example, download the certificate from a web page whose certificate has been issued by the authority. For details, see Steps 1 - 4a in Section 10.4, “Configuring a browser to enable certificate authentication” .

To enable smart card authentication for IdM users who have been issued a certificate by the IdM Certificate Authority, obtain the CA certificate from the **/etc/ipa/ca.crt** file on the IdM server on which the IdM CA is running.

This section describes how to configure an IdM server for smart card authentication. First, obtain files with the CA certificates in the PEM format, then run the in-built **ipa-advise** script. Finally, reload the system configuration.

Prerequisites

- You have root access to the IdM server.

Procedure

1. Create a directory in which you will do the configuration:
   -

```
[root@server]# mkdir ~/SmartCard/
```

2. Navigate to the directory:

```
[root@server]# cd ~/SmartCard/
```

3. Obtain the relevant CA certificates stored in files in the PEM format: **.pem**, **.crt** and **.cer**. The IdM Certificate Authority certificate is located in the **/etc/ipa/ca.crt** file. For convenience, copy the certificates to the directory in which you want to do the configuration:

```
[root@server SmartCard]# cp /etc/ipa/ca.crt ~/SmartCard/
[root@server SmartCard]# cp /tmp/smartcard_ca.pem ~/SmartCard/
```

4. Optionally, if you use certificates of external certificate authorities, use the **openssl x509** utility to view the contents of the files in the **PEM** format to check that the **Issuer** and **Subject** values are correct:

```
[root@server SmartCard]# openssl x509 -noout -text -in smartcard_ca.pem | more
```

5. Generate a configuration script with the in-built **ipa-advise** utility, using the administrator's privileges:

```
[root@server SmartCard]# kinit admin
[root@server SmartCard]# sudo ipa-advise config-server-for-smart-card-auth > config-server-for-smart-card-auth.sh
```

The **config-server-for-smart-card-auth.sh** script performs the following actions:

- It configures the IdM Apache HTTP server.
- It enables Public Key Cryptography for Initial Authentication in Kerberos (PKINIT) on the Key Distribution Center (KDC).
- It configures the IdM Web UI to accept smart card authorization requests.

6. Execute the script, adding the PEM files containing the CA certificates as arguments:

```
[root@server SmartCard]# chmod +x config-server-for-smart-card-auth.sh
[root@server SmartCard]# ./config-server-for-smart-card-auth.sh smartcard_ca.pem ca.crt
Ticket cache:KEYRING:persistent:0:0
Default principal: admin@IDM.EXAMPLE.COM
[...]
Systemwide CA database updated.
The ipa-certupdate command was successful
```

7. Optionally, if the certificate authority that issued the user certificate does not provide any Online Certificate Status Protocol (OCSP) responder, you may need to disable OCSP check for authentication to the IdM Web UI:

   a. Set the **SSLOCSPEnable** parameter to **off** in the **/etc/httpd/conf.d/ssl.conf** file:

```
SSLOCSPEnable off
```

b. Restart the Apache daemon (httpd) for the changes to take effect immediately:

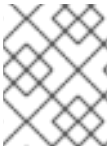
```
[root@server SmartCard]# sudo systemctl restart httpd
```

WARNING

Do not disable the OCSP check if you only use user certificates issued by the IdM CA. OCSP responders are part of IdM.

For instructions on how to keep the OCSP check enabled, and yet prevent a user certificate from being rejected by the IdM server if it does not contain the information about the location at which the CA that issued the user certificate listens for OCSP service requests, see the **SSLOCSPDefaultResponder** directive in Apache mod_ssl configuration options.

The server is now configured for smart card authentication.



NOTE

To enable smart card authentication in the whole topology, run the procedure on each IdM server.

9.2. CONFIGURING THE IDM CLIENT FOR SMART CARD AUTHENTICATION

This section describes how to configure IdM clients for smart card authentication. The procedure needs to be run on each IdM system, a client or a server, to which you want to connect while using a smart card for authentication. For example, to enable an **ssh** connection from host A to host B, the script needs to be run on host B.

As an administrator, run this procedure to enable smart card authentication using

- the **ssh** protocol
- the console login
- the Gnome Display Manager (GDM)
- the **su** command

This procedure is not required for authenticating to the IdM Web UI. Authenticating to the IdM Web UI involves two hosts, neither of which needs to be an IdM client:

- the machine - possibly outside of the IdM domain - on which the browser is running
- the IdM server on which **httpd** is running

The following procedure assumes that you are configuring smart card authentication on an IdM client that is not also an IdM master. For this reason you need two computers: an IdM master to generate the configuration script, and the IdM client on which to run the script.

Prerequisites

- Your IdM server has been configured for smart card authentication, as described in Section 9.1, "Configuring the IdM server for smart card authentication".
- You have root access to the IdM server and the IdM client.

Procedure

1. On an IdM master, generate a configuration script with **ipa-advise** using the administrator's privileges:

```
[root@server SmartCard]# kinit admin
[root@server SmartCard]# ipa-advise config-client-for-smart-card-auth > config-client-for-smart-card-auth.sh
```

   The **config-client-for-smart-card-auth.sh** script performs the following actions:

   - It configures the smart card daemon.
   - It sets the system-wide trust store.
   - It configures the System Security Services Daemon (SSSD) to allow smart card logins to the desktop.

2. From the IdM master, copy the script to a directory of your choice on the IdM client machine:

```
[root@server SmartCard]# scp config-client-for-smart-card-auth.sh root@client.idm.example.com:/root/SmartCard/
Password:
config-client-for-smart-card-auth.sh        100%  2419     3.5MB/s   00:00
```

3. From the IdM master, copy the CA certificate files in the PEM format for convenience to the same directory on the IdM client machine as used in the previous step:

```
[root@server SmartCard]# scp {smartcard_ca.pem,ca.crt} root@client.idm.example.com:/root/SmartCard/
Password:
smartcard_ca.pem                100%  1237     9.6KB/s   00:00
ca.crt                          100%  2514    19.6KB/s   00:00
```

4. On the client machine, execute the script, adding the PEM files containing the CA certificates as arguments:

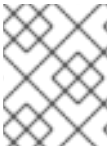
```
[root@client SmartCard]# kinit admin
[root@client SmartCard]# chmod +x config-client-for-smart-card-auth.sh
[root@client SmartCard]# ./config-client-for-smart-card-auth.sh smartcard_ca.pem ca.crt
Ticket cache:KEYRING:persistent:0:0
Default principal: admin@IDM.EXAMPLE.COM
[...]
Systemwide CA database updated.
The ipa-certupdate command was successful
```

The client is now configured for smart card authentication.

9.3. ADDING A CERTIFICATE TO A USER ENTRY IN IDM

This procedure describes how to add an external certificate to a user entry in IdM.

Instead of uploading the whole certificate, it is also possible to upload certificate mapping data to a user entry in IdM. User entries containing either full certificates or certificate mapping data can be used in conjunction with corresponding certificate mapping rules to facilitate the configuration of smart card authentication for system administrators. For details, see Chapter 11, *Configuring certificate mapping rules in Identity Management*.



NOTE

If the user's certificate has been issued by the IdM Certificate Authority, the certificate is already stored in the user entry, and you can skip this section.

Prerequisites

- You have the certificate that you want to add to the user entry at your disposal.

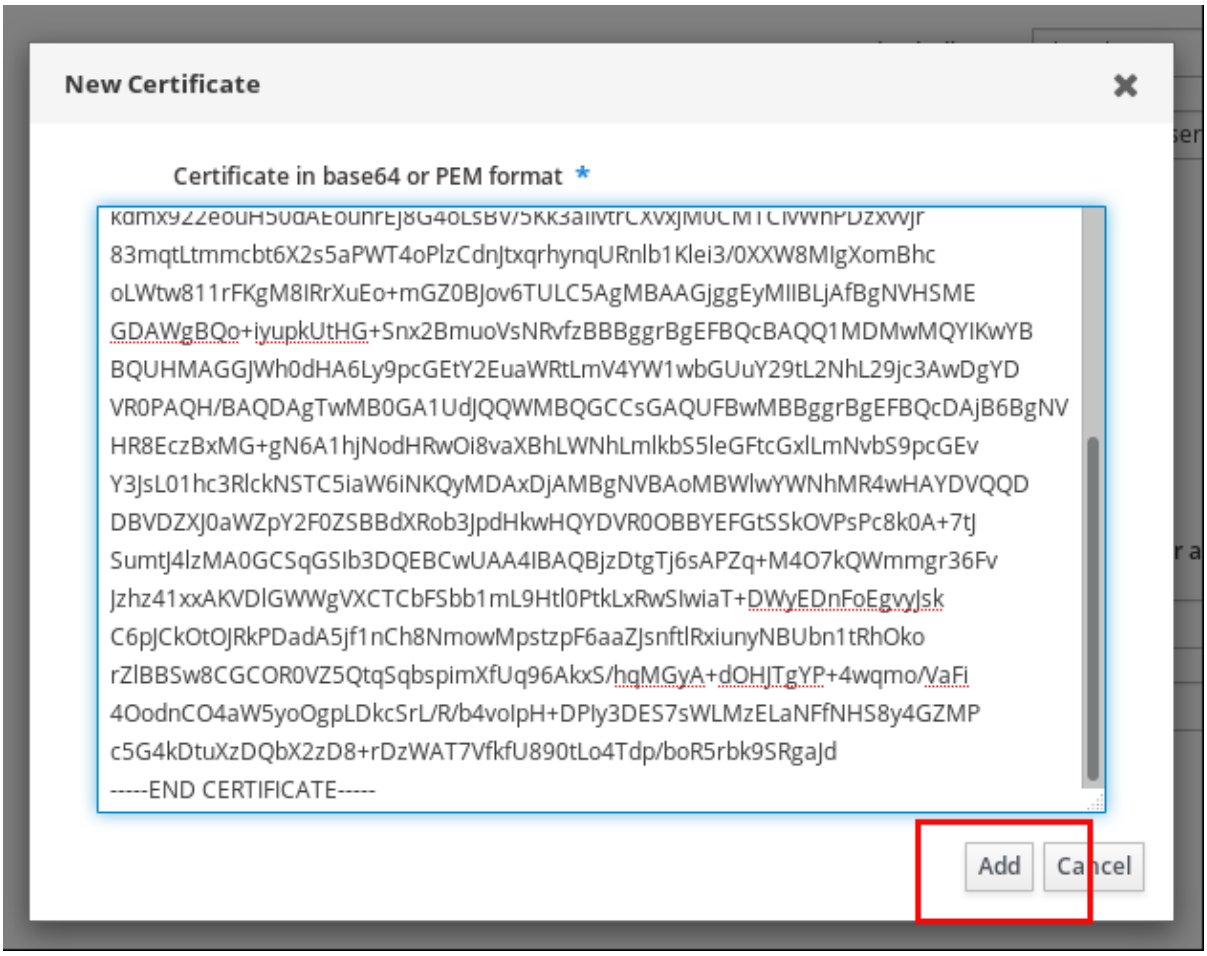
9.3.1. Adding a certificate to a user entry in the IdM Web UI

1. Log into the IdM Web UI as an administrator if you want to add a certificate to another user. For adding a certificate to your own profile, you do not need the administrator's credentials.
2. Navigate to **Users → Active users → sc_user**.
3. Find the **Certificate** option and click **Add**.
4. In the **Command-Line Interface**, display the certificate using the **cat** utility or a text editor:

```
[user@client SmartCard]$ cat sc_user_certificate.pem
```

5. Copy and paste the certificate from the CLI into the window that has opened in the Web UI.
6. Click **Add**.

Figure 9.1. Adding a new certificate in the IdM Web UI



The **sc_user** entry now contains an external certificate.

9.3.2. Adding a certificate to a user entry in the IdM CLI

1. Log into the IdM Web UI as an administrator if you want to add a certificate to another user:

```
[user@client SmartCard]$ kinit admin
```

   For adding a certificate to your own profile, you do not need the administrator's credentials:

```
[user@client SmartCard]$ kinit sc_user
```

2. Create an environment variable containing the certificate with the header and footer removed and concatenated into a single line, which is the format expected by the **ipa user-add-cert** command:

```
[user@client SmartCard]$ export CERT=`openssl x509 -outform der -in
sc_user_certificate.pem | base64 -w0 -`
```

3. Add the certificate to the profile of sc_user using the **ipa user-add-cert** command:

```
[user@client SmartCard]$ ipa user-add-cert sc_user --certificate=$CERT
```

The **sc_user** entry now contains an external certificate.

9.4. CONFIGURING THE BROWSER FOR SMART CARD AUTHENTICATION

This module describes how to configure the Firefox browser for smart card authentication.

Identity Management supports the following browsers for connecting to the web UI:

- Mozilla Firefox 38 and later
- Google Chrome 46 and later

The following procedure shows how to configure the Mozilla Firefox 57.0.1 browser.

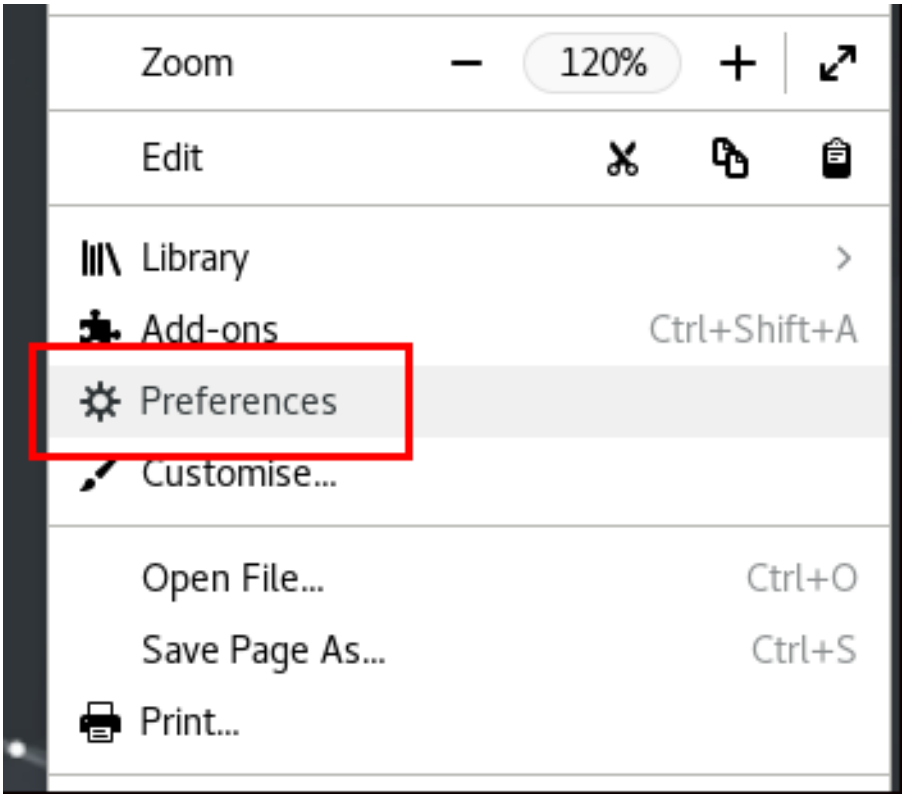
Prerequisites

- Your IdM server has been configured for smart card authentication, as described in Section 9.1, “Configuring the IdM server for smart card authentication”.
- A smart card is inserted into the USB slot of the host on which you want to configure the browser for smart card authentication.
- On the smart card, both the certificate and the private key of the IdM user are stored. For details about importing the certificate and the key on to the smart card, please refer to your smart card vendor’s documentation.
- The user entry in IdM contains the certificate that is stored on the smart card. For details about uploading a certificate into an IdM user’s user entry, see Section 9.3, “Adding a certificate to a user entry in IdM”.

Procedure

1. Open Firefox, click on **Preferences**.

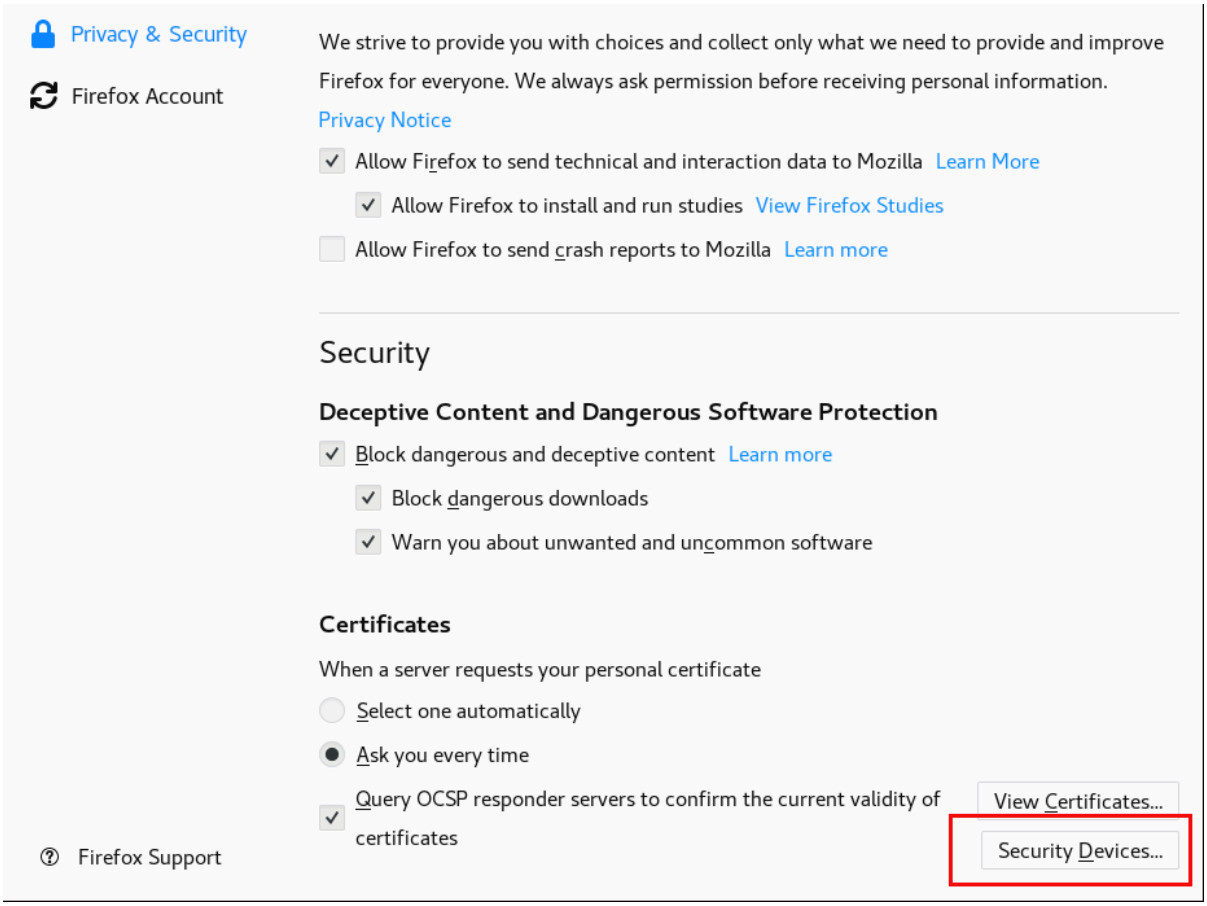
Figure 9.2. Firefox preferences



2. Navigate to **Privacy & Security**.

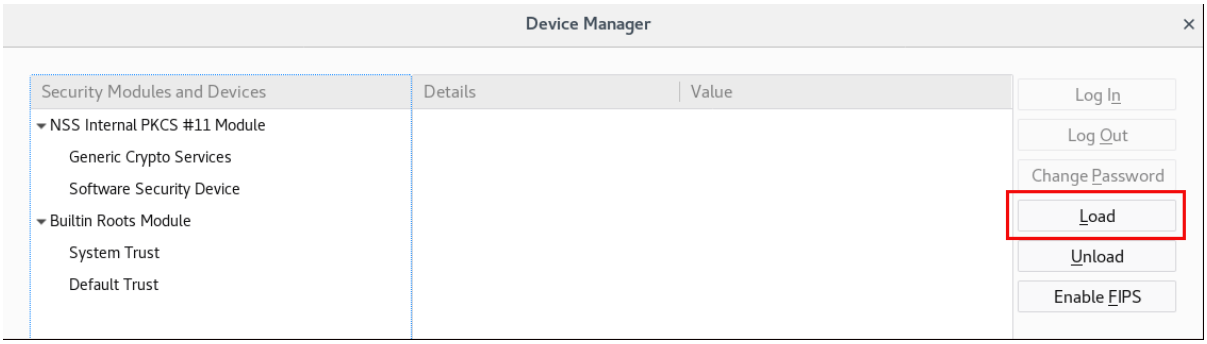
3. Click on **Security Devices**.

Figure 9.3. Security devices



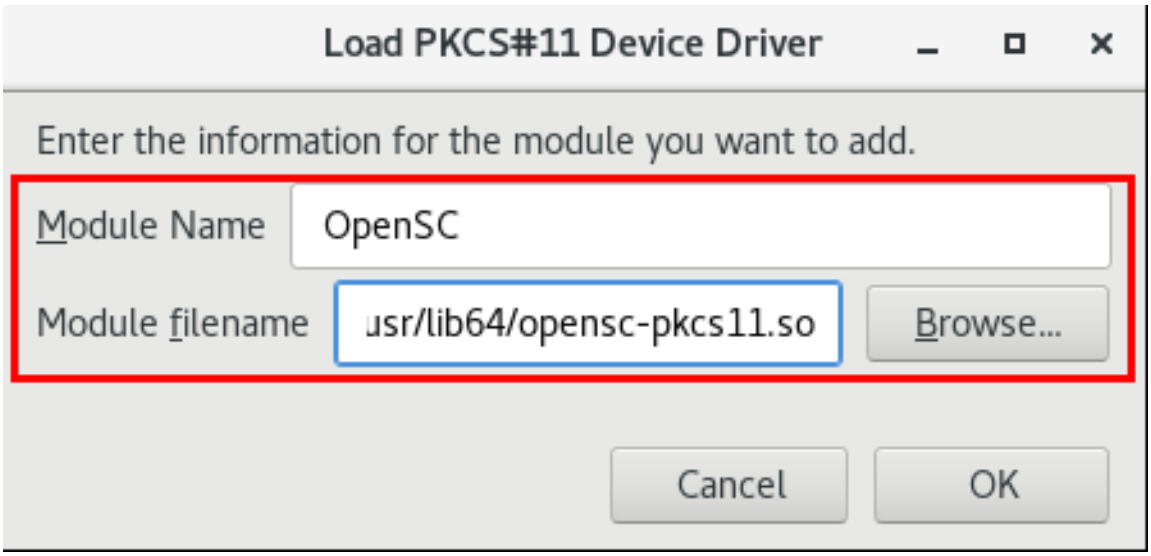
4. In the new **Device Manager** dialogue window, click on **Load**.

Figure 9.4. Loading a security device



5. In the new **Load PKCS#11 Device Driver** dialogue window, enter the module name, for example **OpenSC**. Enter the module filename. The module for OpenSC is located in the **/usr/lib64/opensc-pkcs11.so** file.

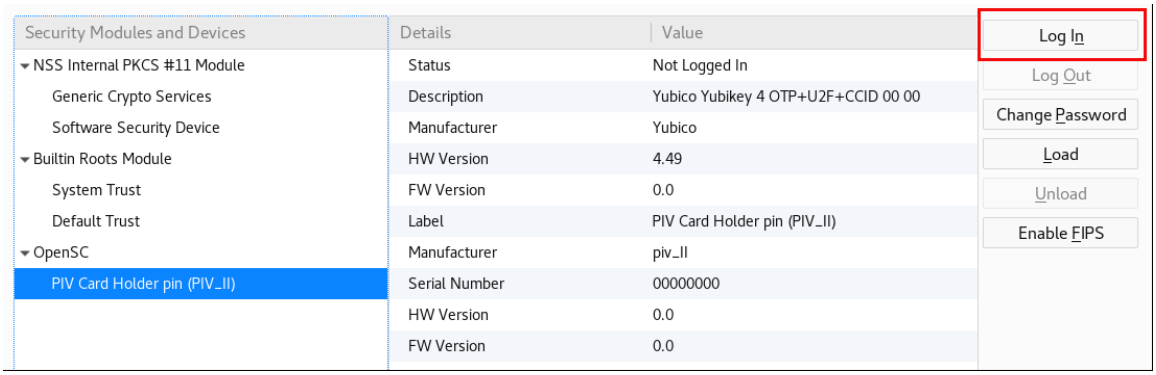
Figure 9.5. Entering the security device information



6. Optionally, check that module can log in to Firefox.

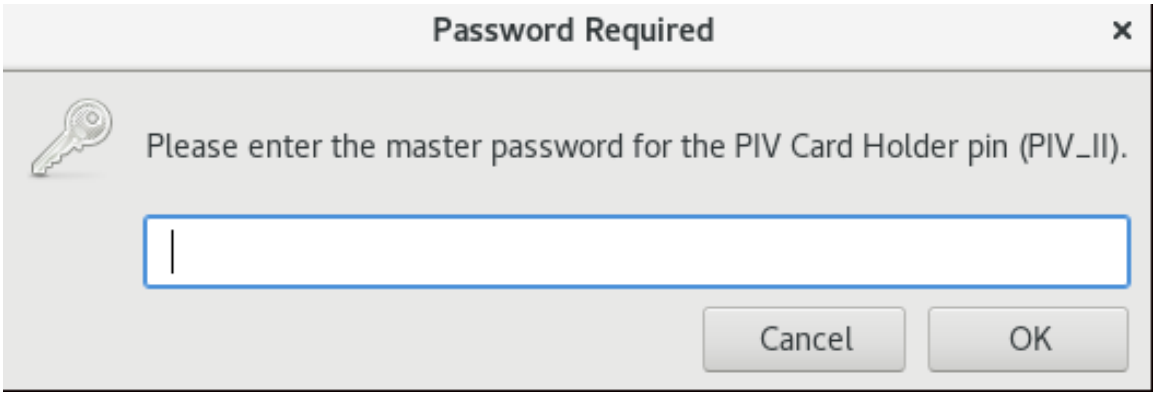
   a. Click on **PIV Card Holder pin (PIV_II)** in the left pane and click **Log In** in the right pane.

   Figure 9.6. Logging in with the security device



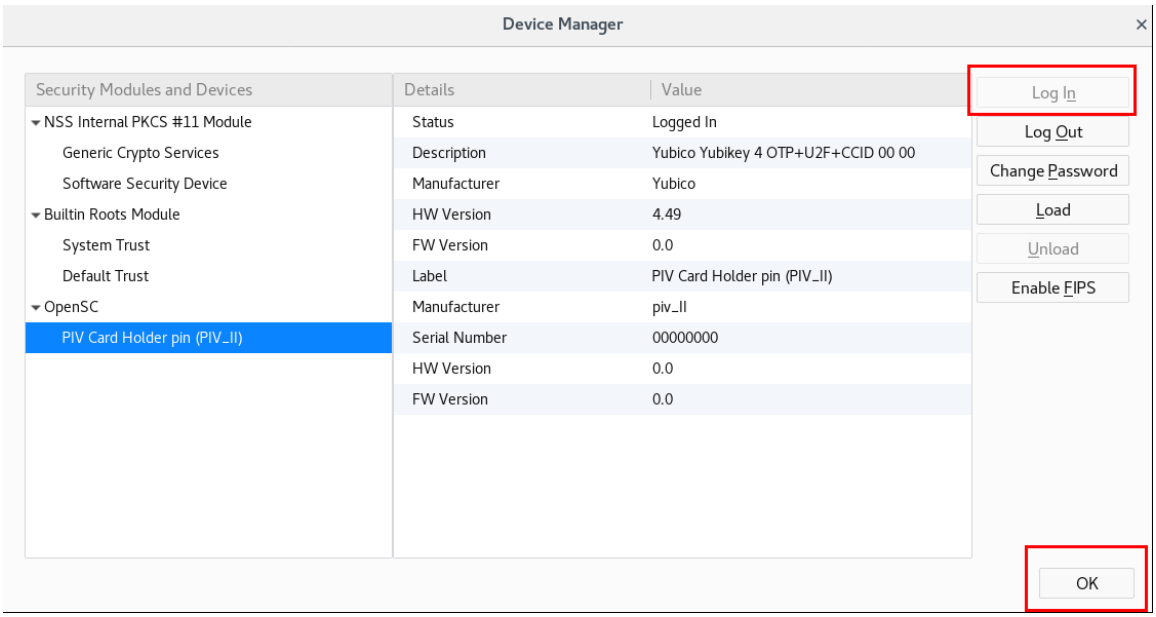
   b. Enter the PIN of the smart card and click **OK**.

   Figure 9.7. Entering the smart card PIN



   If successful, you will see the **Log In** button grayed out.

Figure 9.8. Security device module loaded



7. Click **OK**.

Now your browser is ready for smart card authentication using the loaded security device.

9.5. LOGGING IN TO IDM WITH SMART CARDS

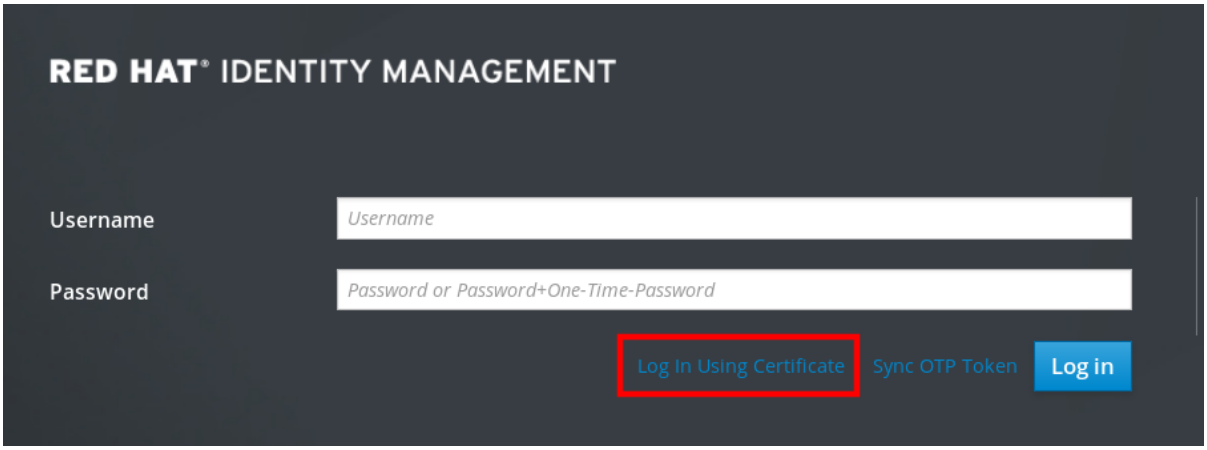
This section provides information about using smart cards for logging in to IdM Web UI.

Prerequisites

- The web browser is configured for using smart card authentication.
- The IdM server has been configured for smart card authentication.
- The certificate installed on your smart card is known to the IdM server.
- You need the PIN for the certificate access.
- The smart card has been plugged to the reader.

Procedure

1. Open the IdM Web UI in the browser.
2. Click on **Log In Using Certificate**

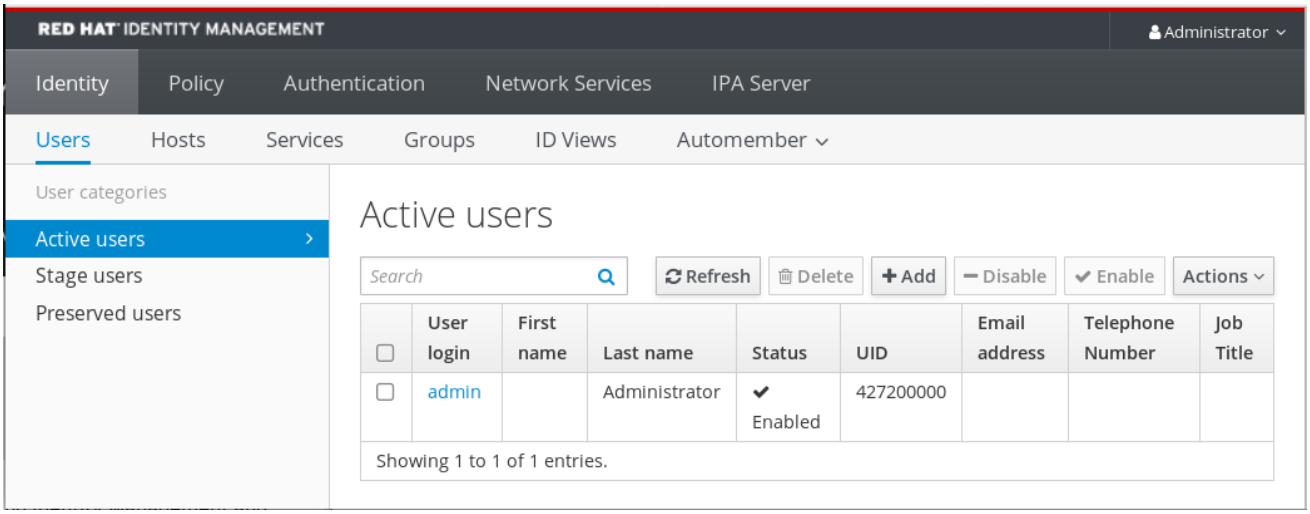


3. If the **Password Required** dialog box opens, add the PIN to unlock the certificate and click the **OK** button.
   The **User Identification Request** dialog box opens.

   If the smart card contains more than one certificate, select the certificate you want to use for authentication in the drop down list below **Choose a certificate to present as identification**

4. Click the **OK** button.

Now you are successfully logged in to the IdM Web UI.



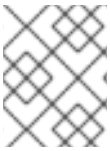
CHAPTER 10. CONFIGURING AUTHENTICATION WITH A CERTIFICATE STORED ON THE DESKTOP OF AN IDM CLIENT

By configuring Identity Management (IdM), IdM system administrators can enable users to authenticate to the IdM web UI and command-line interface (CLI) using a certificate that a Certificate Authority (CA) has issued to the users.

The web browser can run on a system that is not part of the IdM domain.

This user story provides instructions on how to effectively configure and test logging into Identity Management web UI and CLI with a certificate stored on the desktop of an IdM client. In following this user story,

- you can skip Section 10.2, "Requesting a new user certificate and exporting it to the client" if the user you want to authenticate using a certificate already has a certificate;
- you can skip Section 10.3, "Making sure the certificate and user are linked together" if the user's certificate has been issued by the IdM CA.



NOTE

Only Identity Management users can log into the web UI using a certificate. Active Directory users can log in with their user name and password.

10.1. CONFIGURING THE IDENTITY MANAGEMENT SERVER FOR CERTIFICATE AUTHENTICATION IN THE WEB UI

As an Identity Management (IdM) administrator, you can allow users to use certificates to authenticate to your IdM environment.

Procedure

As the Identity Management administrator:

1. On an Identity Management server, obtain administrator privileges and create a shell script to configure the server.
   a. Run the **ipa-advise config-server-for-smart-card-auth** command, and save its output to a file, for example **server_certificate_script.sh**:

```
# kinit admin
# ipa-advise config-server-for-smart-card-auth > server_certificate_script.sh
```

   b. Add execute permissions to the file using the **chmod** utility:

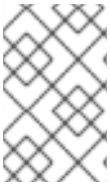
```
# chmod +x server_certificate_script.sh
```

2. On all the servers in the Identity Management domain, run the **server_certificate_script.sh** script
   a. with the path of the IdM Certificate Authority certificate, **/etc/ipa/ca.crt**, as input if the IdM CA is the only certificate authority that has issued the certificates of the users you want to enable certificate authentication for:

```
# ./server_certificate_script.sh /etc/ipa/ca.crt
```

b. with the paths leading to the relevant CA certificates as input if different external CAs signed the certificates of the users who you want to enable certificate authentication for:

```
# ./server_certificate_script.sh /tmp/ca1.pem /tmp/ca2.pem
```



NOTE

Do not forget to run the script on each new replica that you add to the system in the future if you want to have certificate authentication for users enabled in the whole topology.

10.2. REQUESTING A NEW USER CERTIFICATE AND EXPORTING IT TO THE CLIENT

As an Identity Management (IdM) administrator, you can create certificates for users in your IdM environment and export them to the IdM clients on which you want to enable certificate authentication for users.

NOTE

You can skip this section if the user you want to authenticate using a certificate already has a certificate.

Procedure

1. Optionally, create a new directory, for example **~/certdb/**, and make it a temporary certificate database. When asked, create an NSS Certificate DB password to encrypt the keys to the certificate to be generated in a subsequent step:

```
# mkdir ~/certdb/
# certutil -N -d ~/certdb/
Enter a password which will be used to encrypt your keys.
The password should be at least 8 characters long,
and should contain at least one non-alphabetic character.

Enter new password:
Re-enter password:
```

2. Create the certificate signing request (CSR) and redirect the output to a file. For example, to create a CSR with the name **certificate_request.csr** for a **4096** bit certificate for the **idm_user** user in the **IDM.EXAMPLE.COM** realm, setting the nickname of the certificate private keys to **idm_user** for easy findability, and setting the subject to **CN=idm_user,O=IDM.EXAMPLE.COM**:

```
# certutil -R -d ~/certdb/ -a -g 4096 -n idm_user -s "CN=idm_user,O=IDM.EXAMPLE.COM"
> certificate_request.csr
```

3. When prompted, enter the same password that you entered when using **certutil** to create the temporary database. Then continue typing randlomly until told to stop:

```
Enter Password or Pin for "NSS Certificate DB":
```

```
A random seed must be generated that will be used in the
creation of your key.  One of the easiest ways to create a
random seed is to use the timing of keystrokes on a keyboard.

To begin, type keys on the keyboard until this progress meter
is full.  DO NOT USE THE AUTOREPEAT FUNCTION ON YOUR KEYBOARD!


Continue typing until the progress meter is full:
```

4. Submit the certificate request file to the server. Specify the Kerberos principal to associate with the newly-issued certificate, the output file to store the certificate, and optionally the certificate profile. For example, to obtain a certificate of the **IECUserRoles** profile, a profile with added user roles extension, for the **idm_user**@**IDM.EXAMPLE.COM** principal, and save it in the **~/idm_user.pem** file:

```
# ipa cert-request certificate_request.csr --principal=idm_user@IDM.EXAMPLE.COM --
profile-id=IECUserRoles --certificate-out=~/idm_user.pem
```

5. Add the certificate to the NSS database. Use the **-n** option to set the same nickname that you used when creating the CSR previously so that the certificate matches the private key in the NSS database. The **-t** option sets the trust level. For details, see the certutil(1) man page. The **-i** option specifies the input certificate file. For example, to add to the NSS database a certificate with the **idm_user** nickname that is stored in the **~/idm_user.pem** file in the **~/certdb/** database:

```
# certutil -A -d ~/certdb/ -n idm_user -t "P,," -i ~/idm_user.pem
```

6. Verify that the key in the NSS database does not show **(orphan)** as its nickname. For example, to verify that the certificate stored in the **~/certdb/** database is not orphaned:

```
# certutil -K -d ~/certdb/
< 0> rsa      5ad14d41463b87a095b1896cf0068ccc467df395   NSS Certificate DB:
[replaceable]idm_user
```

7. Use the **pk12util** command to export the certificate from the NSS database to the PKCS12 format. For example, to export the certificate with the **idm_user** nickname from the **/root/certdb** NSS database into the **~/idm_user.p12** file:

```
# pk12util -d ~/certdb -o ~/idm_user.p12 -n idm_user
Enter Password or Pin for "NSS Certificate DB":
Enter password for PKCS12 file:
Re-enter password:
pk12util: PKCS12 EXPORT SUCCESSFUL
```

8. Transfer the certificate to the host on which you want the certificate authentication for **idm_user** to be enabled:

```
# scp ~/idm_user.p12 idm_user@client.idm.example.com:/home/idm_user/
```

9. On the host to which the certificate has been transferred, make the directory in which the .pkcs12 file is stored inaccessible to the 'other' group for security reasons:

```
# chmod o-rwx /home/idm_user/
```

10. For security reasons, remove the temporary NSS database and the .pkcs12 file from the server:

```
# rm ~/certdb/
# rm ~/idm_user.p12
```

10.3. MAKING SURE THE CERTIFICATE AND USER ARE LINKED TOGETHER

NOTE

You can skip this section if the user's certificate has been issued by the IdM CA.

For certificate authentication to work, you need to make sure that the certificate is linked to the user that will use it to authenticate to Identity Management (IdM).

- If the certificate is provided by a Certificate Authority that is not part of your Identity Management environment, link the user and the certificate following the procedure described in Linking User Accounts to Certificates .
- If the certificate is provided by Identity Management CA, the certificate is already automatically added in the user entry and you do not have to link the certificate to the user account. For details on creating a new certificate in IdM, see Section 10.2, "Requesting a new user certificate and exporting it to the client".

10.4. CONFIGURING A BROWSER TO ENABLE CERTIFICATE AUTHENTICATION

For certificate authentication to work in your Identity Management web UI, you need to import the user and Certificate Authority (CA) certificates into the Mozilla Firefox or Google Chrome browser running on the host on which you want to enable certificate authentication. The host itself does not have to be part of the IdM domain.

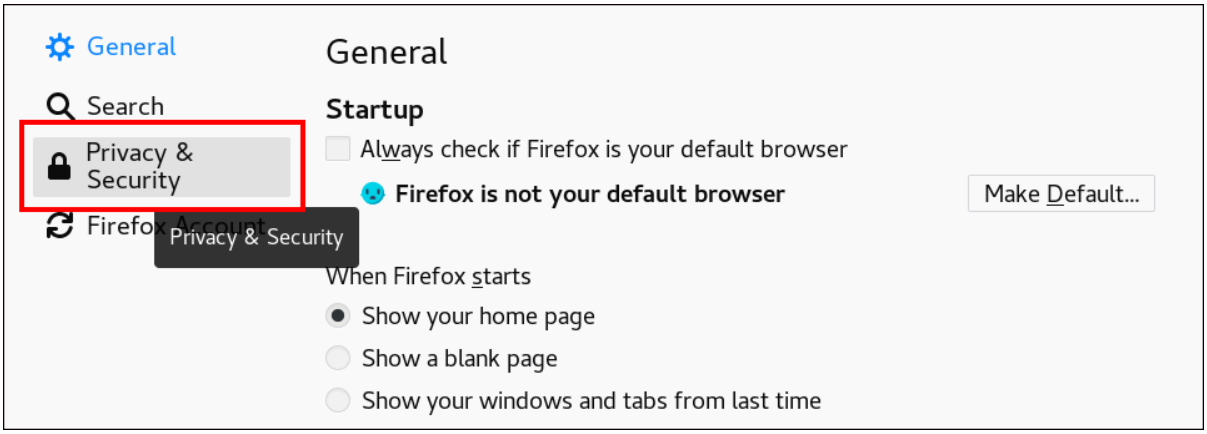
Identity Management supports the following browsers for connecting to the web UI:

- Mozilla Firefox 38 and later
- Google Chrome 46 and later

The following procedure shows how to configure the Mozilla Firefox 57.0.1 browser.

Procedure

1. Open Firefox, then navigate to **Preferences → Privacy & Security**.
.Privacy and Security section in Preferences



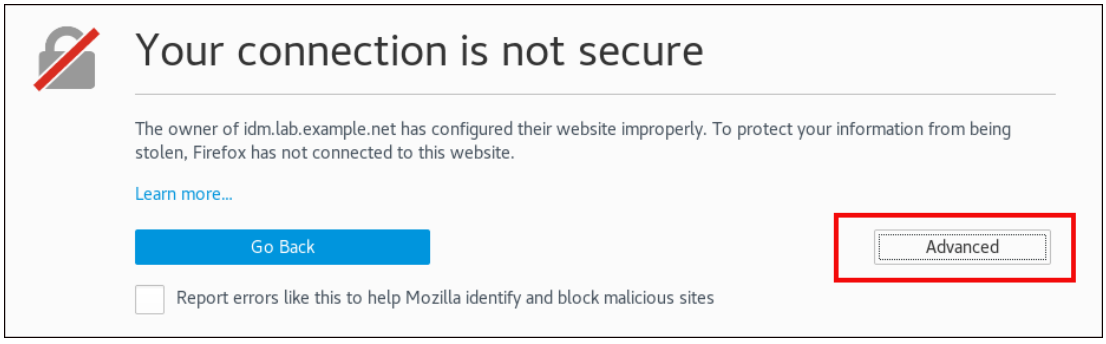
2. Click **View Certificates**.
.View Certificates in Privacy and Security

3. In the **Your Certificates** tab, click **Import**. Locate and open the certificate of the user in the PKCS12 format, then click **OK** and **OK**.

4. Make sure that the Identity Management Certificate Authority is recognized by Firefox as a trusted authority:

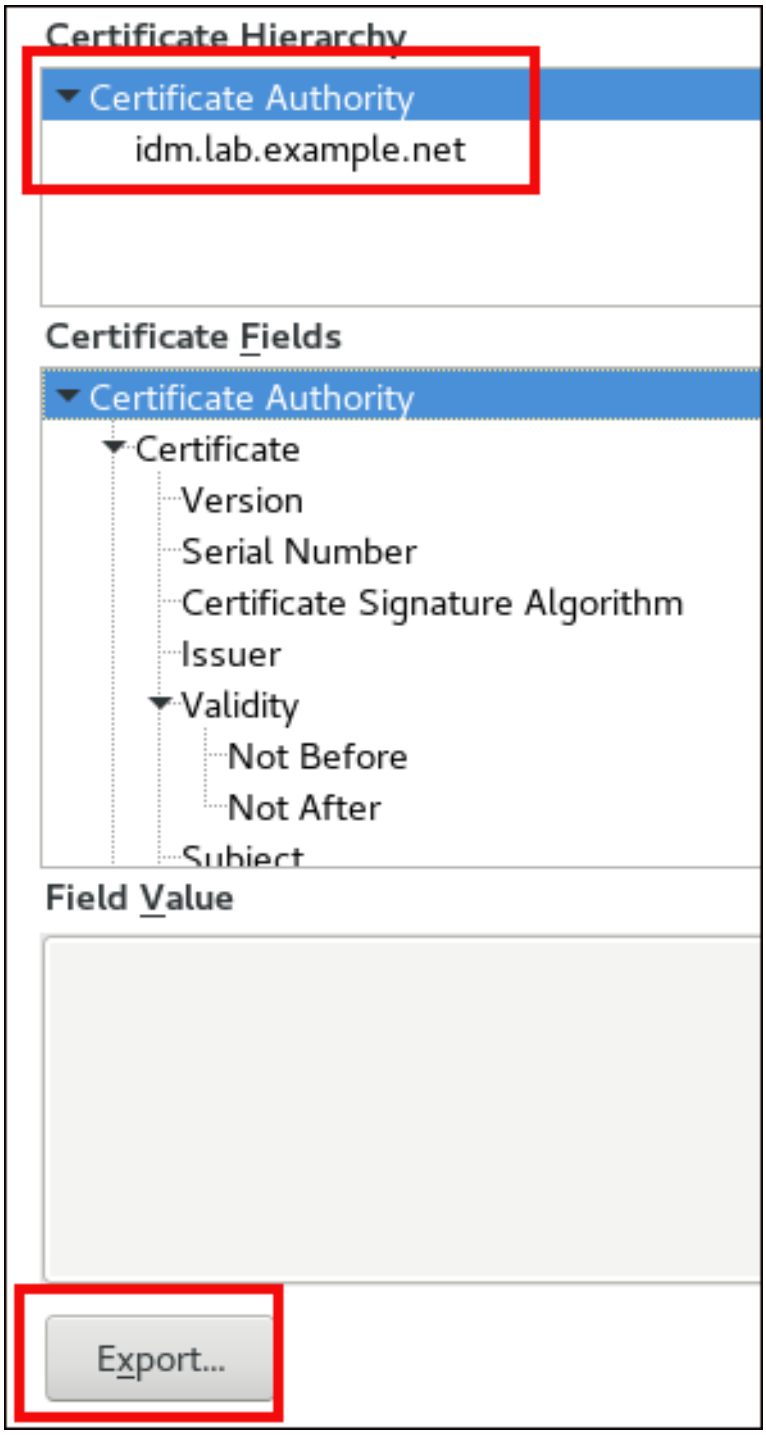
   a. Save the IdM CA certificate locally:

   - Navigate to the IdM web UI by writing the name of your IdM server in the Firefox address bar. Click **Advanced** on the Insecure Connection warning page.
   .Insecure Connection



   - **Add Exception**. Click **View**.
   .View the Details of a Certificate

- In the **Details** tab, highlight the **Certificate Authority** fields.
.Exporting the CA Certificate



- Click **Export**. Save the CA certificate, for example as the **CertificateAuthority.crt** file, then click **Close**, and **Cancel**.

b. Import the IdM CA certificate to Firefox as a trusted certificate authority certificate:

- Open Firefox, navigate to Preferences and click **Privacy & Security**.
.Privacy and Security section in Preferences

- Click **View Certificates**.
.View Certificates in Privacy and Security

- In the **Authorities** tab, click **Import**. Locate and open the CA certificate that you saved in the previous step in the **CertificateAuthority.crt** file. Trust the certificate to identify websites, then click **OK** and **OK**.

5. Continue to Authenticating to the Identity Management Web UI with a Certificate as an Identity Management User.

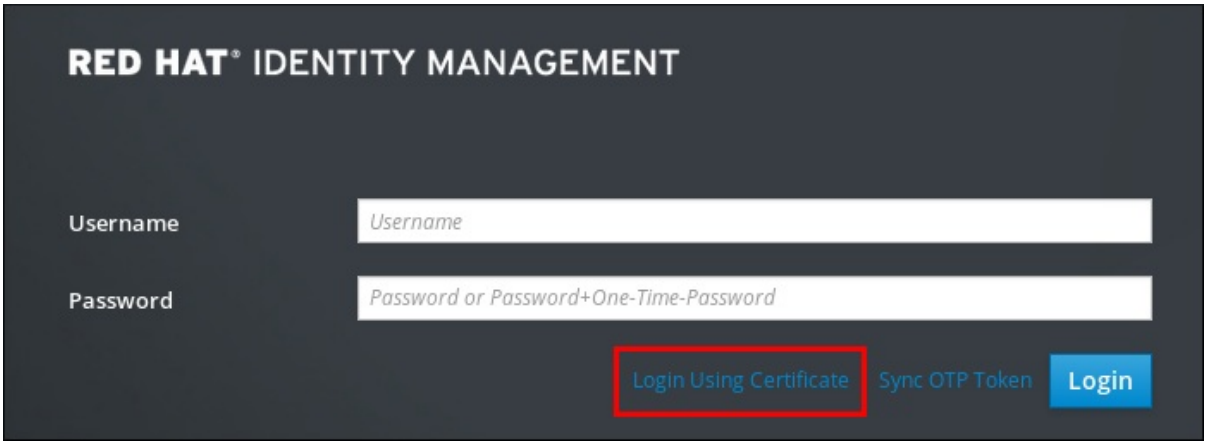
10.5. AUTHENTICATING TO THE IDENTITY MANAGEMENT WEB UI WITH A CERTIFICATE AS AN IDENTITY MANAGEMENT USER

This procedure describes authenticating as a user to the Identity Management (IdM) web UI using a certificate stored on the desktop of an Identity Management client.

Procedure

1. In the browser, navigate to the Identity Management web UI at, for example, **https://server.idm.example.com/ipa/ui**.

2. Click **Login Using Certificate**.
.**Login Using Certificate** in the Identity Management web UI



3. The user's certificate should already be selected. Uncheck **Remember this decision**, then click **OK**.

You are now authenticated as the user who corresponds to the certificate.

Additional Resources

- For information about authenticating to the IdM web UI using a certificate stored on a smart card, see Chapter 9, *Configuring Identity Management for smart card authentication*.

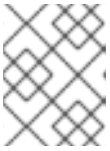
10.6. CONFIGURING AN IDM CLIENT TO ENABLE AUTHENTICATING TO THE CLI USING A CERTIFICATE

To make certificate authentication work for an IdM user in the Command Line Interface (CLI) of your IdM client, import the IdM user's certificate and the private key to the IdM client. For details on creating and transferring the user certificate, see Section 10.2, "Requesting a new user certificate and exporting it to the client".

Procedure

- Log into the IdM client and have the .p12 file containing the user's certificate and the private key ready. To obtain and cache the Kerberos ticket granting ticket (TGT), run the **kinit** command with the user's principal, using the **-X** option with the **X509_username:/path/to/file.p12** attribute to specify where to find the user's X509 identity information. For example, to obtain the TGT for **idm_user** using the user's identity information stored in the **~/idm_user.p12** file:

```
$ kinit -X X509_idm_user='PKCS12:~/idm_user.p12' idm_user
```



NOTE

The command also supports the .pem file format: **kinit -X X509_username='FILE:/path/to/cert.pem,/path/to/key' user_principal**

CHAPTER 11. CONFIGURING CERTIFICATE MAPPING RULES IN IDENTITY MANAGEMENT

11.1. CERTIFICATE MAPPING RULES FOR CONFIGURING AUTHENTICATION ON SMART CARDS

Certificate mapping rules are a convenient way of allowing users to authenticate using certificates in scenarios when the Identity Management (IdM) administrator does not have access to certain users' certificates. This lack of access is typically caused by the fact that the certificates have been issued by an external certificate authority. A special use case is represented by certificates issued by the Certificate System of an Active Directory (AD) with which the IdM domain is in a trust relationship.

Certificate mapping rules are also convenient if the IdM environment is large with a lot of users using smart cards. In this situation, adding full certificates can be complicated. The subject and issuer are predictable in most scenarios and thus easier to add ahead of time than the full certificate. As a system administrator, you can create a certificate mapping rule and add certificate mapping data to a user entry even before a certificate is issued to a particular user. Once the certificate is issued, the user will be able to log in using the certificate even though the full certificate is not uploaded into his entry.

In addition, as certificates have to be renewed at regular intervals, certificate mapping rules reduce administrative overhead. When a user's certificate gets renewed, the administrator does not have to update the user entry. For example, if the mapping is based on the **Subject** and **Issuer** values, and if the new certificate has the same subject and issuer as the old one, the mapping still applies. If, in contrast, the full certificate was used, then the administrator would have to upload the new certificate to the user entry to replace the old one.

To set up certificate mapping:

1. An administrator has to load the certificate mapping data (typically the issuer and subject) or the full certificate into a user account.

2. An administrator has to create a certificate mapping rule to allow successful logging into IdM for a user

    a. whose account contains a certificate mapping data entry

    b. whose certificate mapping data entry matches the information on the certificate

    For details on the individual components that make up a mapping rule and how to obtain and use them, see Components of an identity mapping rule in IdM and Obtaining the issuer from a certificate for use in a matching rule.

Afterwards, when the end-user presents his certificate, stored either in the filesystem or on a smart card, he authenticates successfully.

11.1.1. Certificate mapping rules for trusts with Active Directory domains

This section outlines the different certificate mapping use cases that are possible if an IdM deployment is in a trust relationship with an Active Directory (AD) domain.

Certificate mapping rules are a convenient way to enable access to IdM resources for users who have smart card certificates that were issued by the trusted AD Certificate System. Depending on the AD configuration, the following scenarios are possible:

- If the certificate is issued by AD but the user and the certificate are stored in IdM, the mapping and the whole processing of the authentication request takes place on the IdM side. For details of configuring this scenario, see Configuring certificate mapping for users stored in IdM .
- If the user is stored in AD, the processing of the authentication request takes place in AD. There are three different subcases:
  - The AD user entry contains the whole certificate. For details how to configure IdM in this scenario, see Configuring certificate mapping for users whose AD user entry contains the whole certificate.
  - AD is configured to map user certificates to user accounts. In this case, the AD user entry does not contain the whole certificate but instead contains an attribute called **altSecurityIdentities**. For details how to configure IdM in this scenario, see Configuring certificate mapping if AD is configured to map user certificates to user accounts.
  - The AD user entry contains neither the whole certificate nor the mapping data. In this case, the only solution is to use the **ipa idoverrideuser-add** command to add the whole certificate to the AD user's ID override in IdM. For details, see Configuring certificate mapping if AD user entry contains no certificate or mapping data.

11.1.2. Components of an identity mapping rule in IdM

This section describes the components of an *identity mapping rule* in IdM and how to configure them. Each component has a default value that you can override. You can define the components in either the web UI or the CLI. In the CLI, the identity mapping rule is created using the **ipa certmaprule-add** command.

Mapping rule

The mapping rule component associates (or *maps*) a certificate with one or more user accounts. The rule defines an LDAP search filter that associates a certificate with the intended user account. Certificates issued by different certificate authorities (CAs) might have different properties and might be used in different domains. Therefore, IdM does not apply mapping rules unconditionally, but only to the appropriate certificates. The appropriate certificates are defined using *matching rules*.

Note that if you leave the mapping rule option empty, the certificates are searched in the **userCertificate** attribute as a DER encoded binary file.

Define the mapping rule in the CLI using the **--maprule** option.

Matching rule

The matching rule component selects a certificate to which you want to apply the mapping rule. The default matching rule matches certificates with the **digitalSignature key** usage and **clientAuth extended key** usage.
Define the matching rule in the CLI using the **--matchrule** option.

Domain list

The domain list specifies the identity domains in which you want IdM to search the users when processing identity mapping rules. If you leave the option unspecified, IdM searches the users only in the local domain to which the IdM client belongs.
Define the domain in the CLI using the **--domain** option.

Priority

When multiple rules are applicable to a certificate, the rule with the highest priority takes precedence. All other rules are ignored.

- The lower the numerical value, the higher the priority of the identity mapping rule. For example, a rule with a priority 1 has higher priority than a rule with a priority 2.
- If a rule has no priority value defined, it has the lowest priority.

Define the mapping rule priority in the CLI using the **--priority** option.

Certificate Mapping Rule Example 1

To define, using the CLI, a certificate mapping rule called **simple_rule** that allows authentication for a certificate issued by the **Smart Card CA** of the **EXAMPLE.ORG** organisation as long as the **Subject** on that certificate matches a **certmapdata** entry in a user account in IdM:

```
# ipa certmaprule-add simple_rule --matchrule '<ISSUER>CN=Smart Card
CA,O=EXAMPLE.ORG' --maprule '(ipacertmapdata=X509:<I>{issuer_dn!nss_x500}<S>
{subject_dn!nss_x500})'
```

11.1.3. Obtaining the issuer from a certificate for use in a matching rule

This procedure describes how to obtain the issuer information from a certificate so that you can copy and paste it into the matching rule of a certificate mapping rule. To get the issuer format required by a matching rule, use the **openssl x509** utility.

Prerequisites

- You have the user certificate in a **.pem** or **.crt** format

Procedure

1. Obtain the user information from the certificate. Use the **openssl x509** certificate display and signing utility with:
   - the **-noout** option to prevent the output of an encoded version of the request
   - the **-issuer** option to output the issuer name
   - the **-in** option to specify the input filename to read the certificate from
   - the **-nameopt** option with the **RFC2253** value to display the output with the most specific relative distinguished name (RDN) first
     If the input file contains an Identity Management certificate, the output of the command shows that the Issuer is defined using the **Organisation** information:

     ```
     # openssl x509 -noout -issuer -in idm_user.crt -nameopt RFC2253
     issuer=CN=Certificate Authority,O=REALM.EXAMPLE.COM
     ```

     If the input file contains an Active Directory certificate, the output of the command shows that the Issuer is defined using the **Domain Component** information:

     ```
     # openssl x509 -noout -issuer -in ad_user.crt -nameopt RFC2253
     issuer=CN=AD-WIN2012R2-CA,DC=AD,DC=EXAMPLE,DC=COM
     ```

2. Optionally, to create a new mapping rule in the CLI based on a matching rule which specifies that the certificate issuer must be the extracted **AD-WIN2012R2-CA** of the **ad.example.com** domain and the subject on the certificate must match the **certmapdata** entry in a user account in IdM:

```
# ipa certmaprule-add simple_rule --matchrule '<ISSUER>CN=AD-WIN2012R2-CA,DC=AD,DC=EXAMPLE,DC=COM' --maprule '(ipacertmapdata=X509:<I>{issuer_dn!nss_x500}<S>{subject_dn!nss_x500})'
```

Additional information

For details about the **certmap** command, including information about the supported formats for the matching rule and the mapping rule, and an explanation of the priority and domain fields, see the **sss-certmap(5)** man page.

11.2. CONFIGURING CERTIFICATE MAPPING FOR USERS STORED IN IDM

This user story describes the steps a system administrator must take to enable certificate mapping in IdM if the user for whom certificate authentication is being configured is stored in IdM.

Prerequisites

- The user has an account in IdM.
- The administrator has either the whole certificate or the certificate mapping data to add to the user entry.

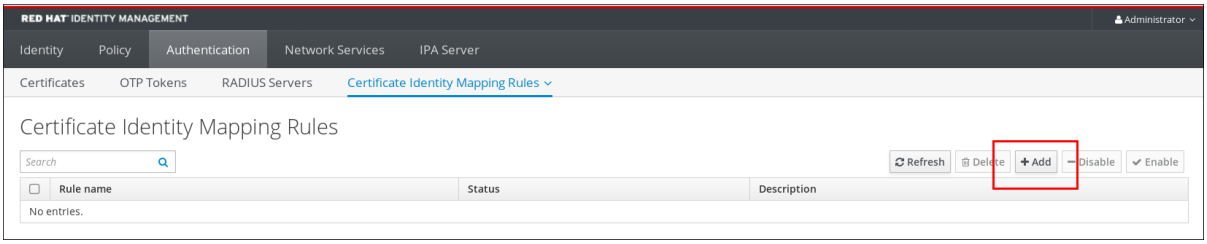
11.2.1. Adding a certificate mapping rule in IdM

This section describes how to set up a certificate mapping rule so that IdM users with certificates that match the conditions specified in the mapping rule and in their certificate mapping data entries can authenticate to IdM.

11.2.1.1. Adding a certificate mapping rule in the IdM web UI

1. Log in to the IdM web UI as an administrator.
2. Navigate to **Authentication → Certificate Identity Mapping Rules → Certificate Identity Mapping Rules**.
3. Click **Add**.

Figure 11.1. Adding a new certificate mapping rule in the IdM web UI



4. Enter the rule name.

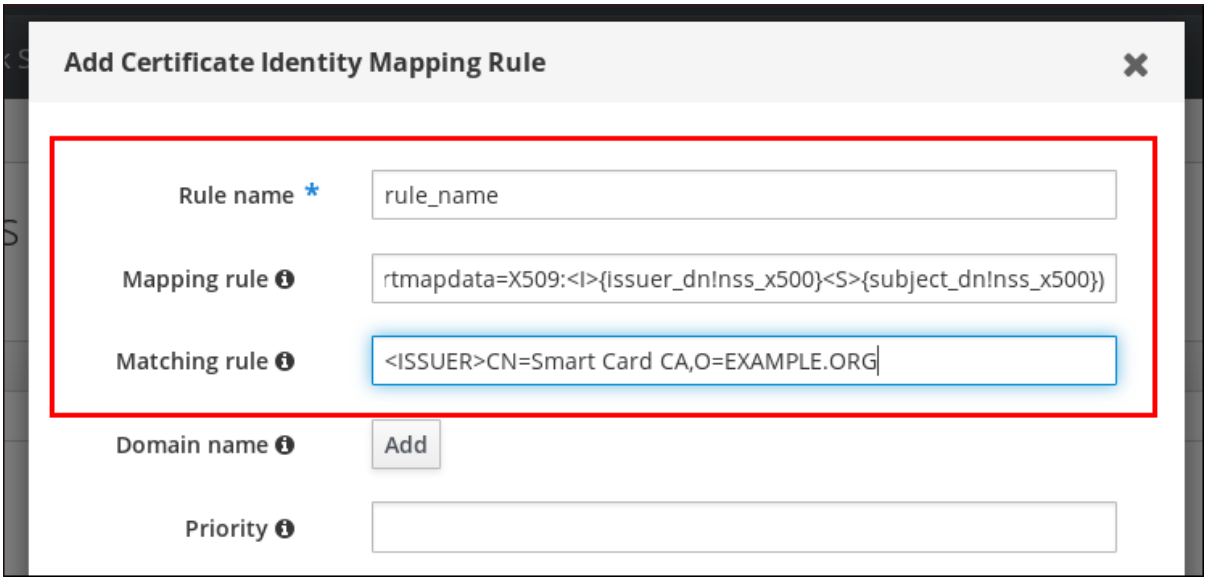
5. Enter the mapping rule. For example, to make IdM search for the **Issuer** and **Subject** entries in any certificate presented to them, and base its decision to authenticate or not on the information found in these two entries of the presented certificate:

```
(ipacertmapdata=X509:<I>{issuer_dn!nss_x500}<S>{subject_dn!nss_x500})
```

6. Enter the matching rule. For example, to only allow certificates issued by the **Smart Card CA** of the **EXAMPLE.ORG** organization to authenticate users to IdM:

```
<ISSUER>CN=Smart Card CA,O=EXAMPLE.ORG
```

Figure 11.2. Entering the details for a certificate mapping rule in the IdM web UI



7. Click **Add** at the bottom of the dialog box to add the rule and close the box.

8. The System Security Services Daemon (SSSD) periodically re-reads the certificate mapping rules. To force the newly-created rule to be loaded immediately, restart SSSD:

```
# systemctl restart sssd
```

Now you have a certificate mapping rule set up that compares the type of data specified in the mapping rule that it finds on a smart card certificate with the certificate mapping data in your IdM user entries. Once it finds a match, it authenticates the matching user.

11.2.1.2. Adding a certificate mapping rule in the IdM CLI

1. Obtain the administrator's credentials:

```
# kinit admin
```

2. Enter the mapping rule and the matching rule the mapping rule is based on. For example, to make IdM search for the **Issuer** and **Subject** entries in any certificate presented, and base its decision to authenticate or not on the information found in these two entries of the presented certificate, recognizing only certificates issued by the **Smart Card CA** of the **EXAMPLE.ORG** organization:

```
# ipa certmaprule-add rule_name --matchrule '<ISSUER>CN=Smart Card
CA,O=EXAMPLE.ORG' --maprule '(ipacertmapdata=X509:<I>{issuer_dn!nss_x500}<S>
```

```
{subject_dn!nss_x500})'
----------------------------------------------------
Added Certificate Identity Mapping Rule "rule_name"
----------------------------------------------------
  Rule name: rule_name
  Mapping rule: (ipacertmapdata=X509:<I>{issuer_dn!nss_x500}<S>{subject_dn!nss_x500})
  Matching rule: <ISSUER>CN=Smart Card CA,O=EXAMPLE.ORG
  Enabled: TRUE
```

3. The System Security Services Daemon (SSSD) periodically re-reads the certificate mapping rules. To force the newly-created rule to be loaded immediately, restart SSSD:

```
# systemctl restart sssd
```

Now you have a certificate mapping rule set up that compares the type of data specified in the mapping rule that it finds on a smart card certificate with the certificate mapping data in your IdM user entries. Once it finds a match, it authenticates the matching user.

11.2.2. Adding certificate mapping data to a user entry in IdM

This section describes how to enter certificate mapping data to an IdM user entry so that the user can authenticate using multiple certificates as long as they all contain the values specified in the certificate mapping data entry.

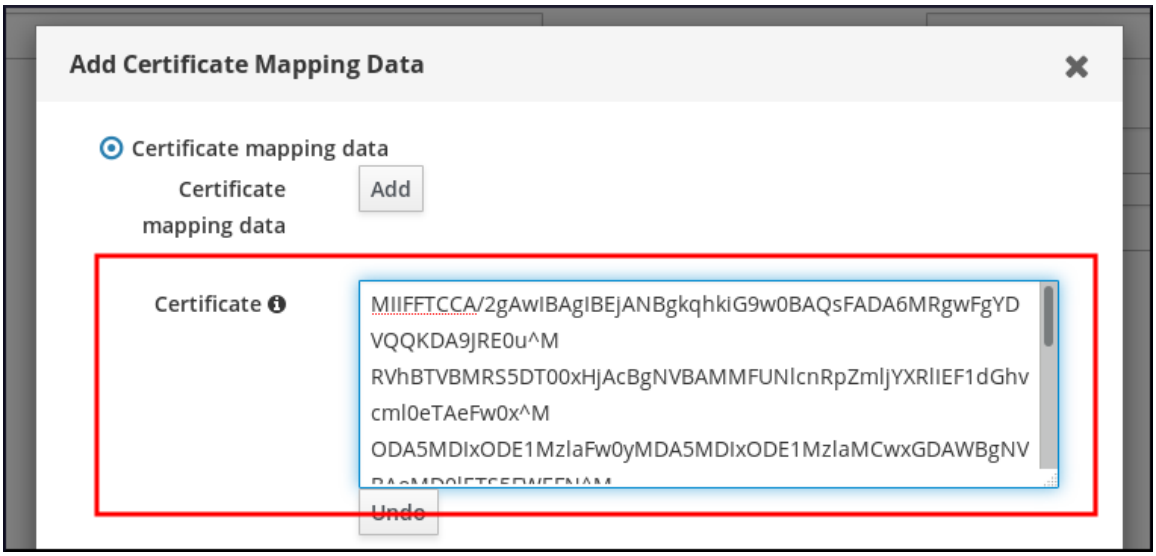
11.2.2.1. Adding certificate mapping data to a user entry in the IdM web UI

1. Log into the IdM web UI as an administrator.
2. Navigate to **Users → Active users → idm_user**.
3. Find the **Certificate mapping data** option and click **Add**.
4. If you have the certificate of **idm_user** at your disposal:
   a. In the Command-Line Interface, display the certificate using the **cat** utility or a text editor:

```
[root@server ~]# cat idm_user_certificate.pem
-----BEGIN CERTIFICATE-----
MIIFFTCCA/2gAwIBAgIBEjANBgkqhkiG9w0BAQsFADA6MRgwFgYDVQQKDA9JRE0u
RVhBTVBMRS5DT00xHjAcBgNVBAMMFUNlcnRpZmljYXRlIEF1dGhvcml0eTAeFw0x
ODA5MDIxODE1MzlaFw0yMDA5MDIxODE1MzlaMCwxGDAWBgNVBAoMD0lETS5FWE
FN
[...output truncated...]
```

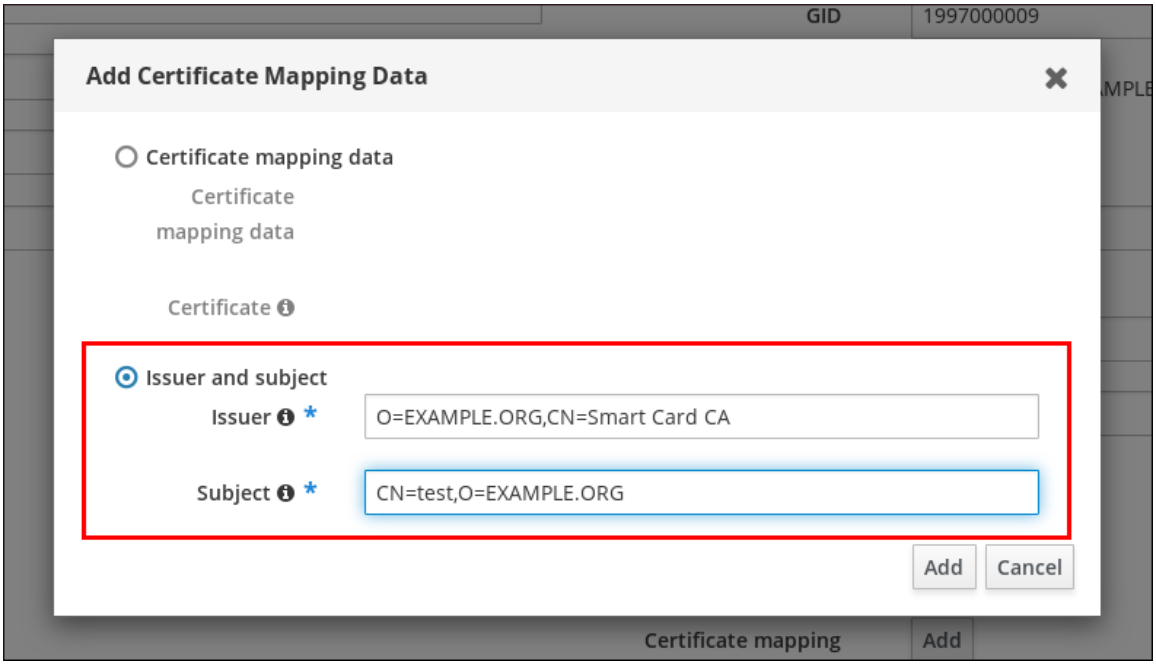
   b. Copy the certificate.
   c. In the IdM web UI, click **Add** next to **Certificate** and paste the certificate into the window that opens up.

Figure 11.3. Adding a user's certificate mapping data: certificate



Alternatively, if you do not have the certificate of **idm_user** at your disposal but know the **Issuer** and the **Subject** of the certificate, check the radio button of **Issuer and subject** and enter the values in the two respective boxes.

Figure 11.4. Adding a user's certificate mapping data: issuer and subject



5. Click **Add**.

6. Optionally, if you have access to the whole certificate in the **.pem** format, verify that the user and certificate are linked:

   a. Use the **sss_cache** utility to invalidate the record of **idm_user** in the SSSD cache and force a reload of the **idm_user** information:

   ```
   # sss_cache -u idm_user
   ```

   b. Run the **ipa certmap-match** command with the name of the file containing the certificate of the IdM user:

```
# ipa certmap-match idm_user_cert.pem
--------------
1 user matched
--------------
 Domain: IDM.EXAMPLE.COM
 User logins: idm_user
----------------------------
Number of entries returned 1
----------------------------
```

The output confirms that now you have certificate mapping data added to **idm_user** and that a corresponding mapping rule defined in Adding a certificate mapping rule in IdM exists. This means that you can use any certificate that matches the defined certificate mapping data to authenticate as **idm_user**.

11.2.2.2. Adding certificate mapping data to a user entry in the IdM CLI

1. Obtain the administrator's credentials:

```
# kinit admin
```

2. If you have the certificate of **idm_user** at your disposal, add the certificate to the user account using the **ipa user-add-cert** command:

```
# CERT=`cat idm_user_cert.pem | tail -n +2| head -n -1 | tr -d '\r\n'\`
# ipa user-add-certmapdata idm_user --certificate $CERT
```

Alternatively, if you do not have the certificate of **idm_user** at your disposal but know the **Issuer** and the **Subject** of idm_user's certificate:

```
# ipa user-add-certmapdata idm_user --subject "O=EXAMPLE.ORG,CN=test" --issuer
"CN=Smart Card CA,O=EXAMPLE.ORG"
-----------------------------------------
Added certificate mappings to user "idm_user"
-----------------------------------------
  User login: idm_user
  Certificate mapping data: X509:<I>O=EXAMPLE.ORG,CN=Smart Card
CA<S>CN=test,O=EXAMPLE.ORG
```

3. Optionally, if you have access to the whole certificate in the **.pem** format, verify that the user and certificate are linked:

   a. Use the **sss_cache** utility to invalidate the record of **idm_user** in the SSSD cache and force a reload of the **idm_user** information:

```
# sss_cache -u idm_user
```

   b. Run the **ipa certmap-match** command with the name of the file containing the certificate of the IdM user:

```
# ipa certmap-match idm_user_cert.pem
--------------
1 user matched
--------------
```

```
Domain: IDM.EXAMPLE.COM
User logins: idm_user
----------------------------
Number of entries returned 1
----------------------------
```

The output confirms that now you have certificate mapping data added to **idm_user** and that a corresponding mapping rule defined in Adding a certificate mapping rule in IdM exists. This means that you can use any certificate that matches the defined certificate mapping data to authenticate as **idm_user**.

11.3. CONFIGURING CERTIFICATE MAPPING FOR USERS WHOSE AD USER ENTRY CONTAINS THE WHOLE CERTIFICATE

This user story describes the steps necessary for enabling certificate mapping in IdM if the IdM deployment is in trust with Active Directory (AD), the user is stored in AD and the user entry in AD contains the whole certificate.

Prerequisites

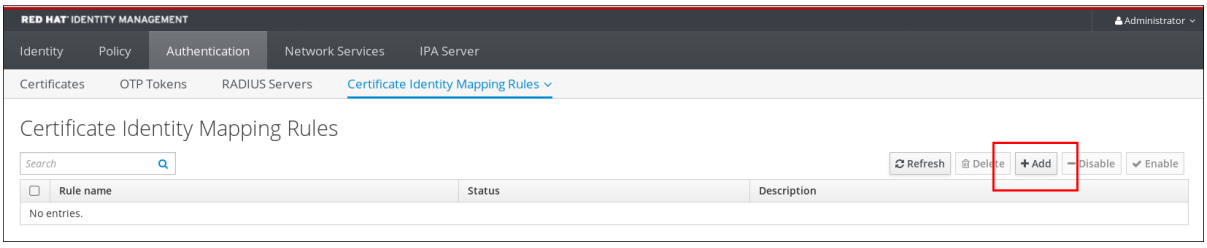
- The user does not have an account in IdM.
- The user has an account in AD which contains a certificate.
- The IdM administrator has access to data on which the IdM certificate mapping rule can be based.

11.3.1. Adding a certificate mapping rule for users whose AD entry contains whole certificates

11.3.1.1. Adding a certificate mapping rule in the IdM web UI

1. Log into the IdM web UI as an administrator.
2. Navigate to **Authentication → Certificate Identity Mapping Rules → Certificate Identity Mapping Rules**.
3. Click **Add**.

Figure 11.5. Adding a new certificate mapping rule in the IdM web UI



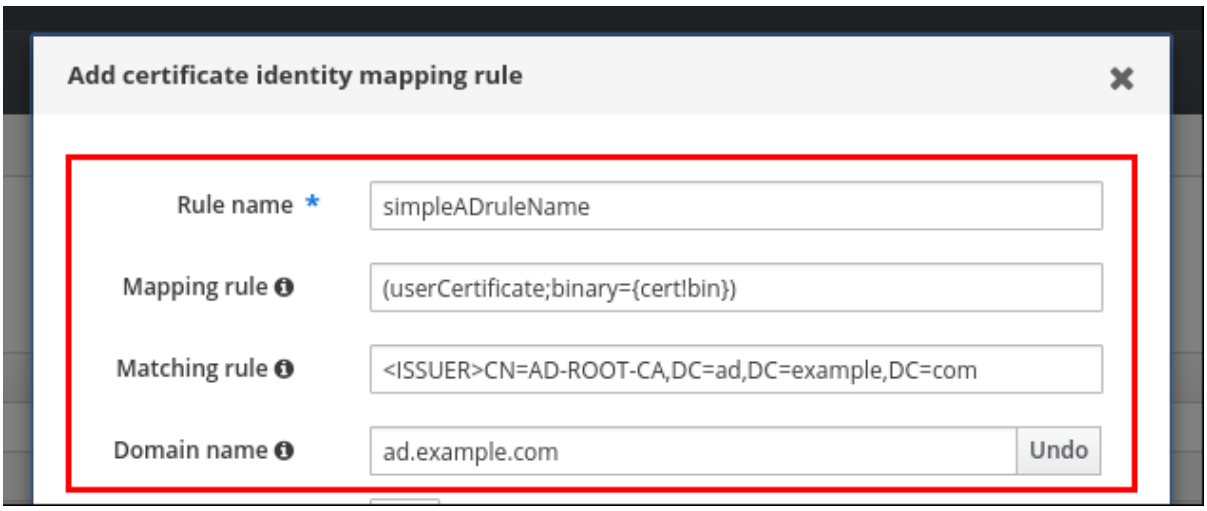
4. Enter the rule name.
5. Enter the mapping rule. To have the whole certificate that is presented to IdM for authentication compared to what is available in AD:

```
(userCertificate;binary={cert!bin})
```

6. Enter the matching rule. For example, to only allow certificates issued by the **AD-ROOT-CA** of the **AD.EXAMPLE.COM** domain to authenticate:

```
<ISSUER>CN=AD-ROOT-CA,DC=ad,DC=example,DC=com
```

Figure 11.6. Certificate mapping rule for a user with a certificate stored in AD



7. Click **Add**.

8. The System Security Services Daemon (SSSD) periodically re-reads the certificate mapping rules. To force the newly-created rule to be loaded immediately, restart SSSD in the CLI::

```
# systemctl restart sssd
```

11.3.1.2. Adding a certificate mapping rule in the IdM CLI

1. Obtain the administrator's credentials:

```
# kinit admin
```

2. Enter the mapping rule and the matching rule the mapping rule is based on. To have the whole certificate that is presented for authentication compared to what is available in AD, only allowing certificates issued by the **AD-ROOT-CA** of the **AD.EXAMPLE.COM** domain to authenticate:

```
# ipa certmaprule-add simpleADrule --matchrule '<ISSUER>CN=AD-ROOT-CA,DC=ad,DC=example,DC=com' --maprule '(userCertificate;binary={cert!bin})' --domain ad.example.com
----------------------------------------------------
Added Certificate Identity Mapping Rule "simpleADrule"
----------------------------------------------------
  Rule name: simpleADrule
  Mapping rule: (userCertificate;binary={cert!bin})
  Matching rule: <ISSUER>CN=AD-ROOT-CA,DC=ad,DC=example,DC=com
  Domain name: ad.example.com
  Enabled: TRUE
```

3. The System Security Services Daemon (SSSD) periodically re-reads the certificate mapping rules. To force the newly-created rule to be loaded immediately, restart SSSD:

```
# systemctl restart sssd
```

11.4. CONFIGURING CERTIFICATE MAPPING IF AD IS CONFIGURED TO MAP USER CERTIFICATES TO USER ACCOUNTS

This user story describes the steps necessary for enabling certificate mapping in IdM if the IdM deployment is in trust with Active Directory (AD), the user is stored in AD and the user entry in AD contains certificate mapping data.

Prerequisites

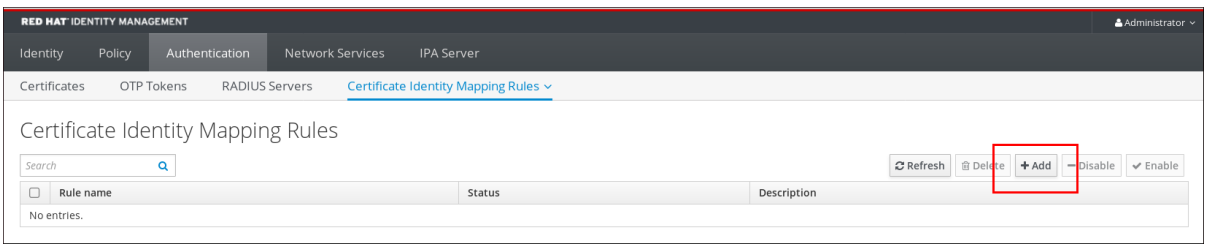
- The user does not have an account in IdM.
- The user has an account in AD which contains the **altSecurityIdentities** attribute, the AD equivalent of the IdM **certmapdata** atttribute.
- The IdM administrator has access to data on which the IdM certificate mapping rule can be based.

11.4.1. Adding a certificate mapping rule if the trusted AD domain is configured to map user certificates

11.4.1.1. Adding a certificate mapping rule in the IdM web UI

1. Log into the IdM web UI as an administrator.
2. Navigate to **Authentication → Certificate Identity Mapping Rules → Certificate Identity Mapping Rules**.
3. Click **Add**.

Figure 11.7. Adding a new certificate mapping rule in the IdM web UI



4. Enter the rule name.
5. Enter the mapping rule. For example, to make AD DC search for the **Issuer** and **Subject** entries in any certificate presented, and base its decision to authenticate or not on the information found in these two entries of the presented certificate:

```
(altSecurityIdentities=X509:<I>{issuer_dn!ad_x500}<S>{subject_dn!ad_x500})
```

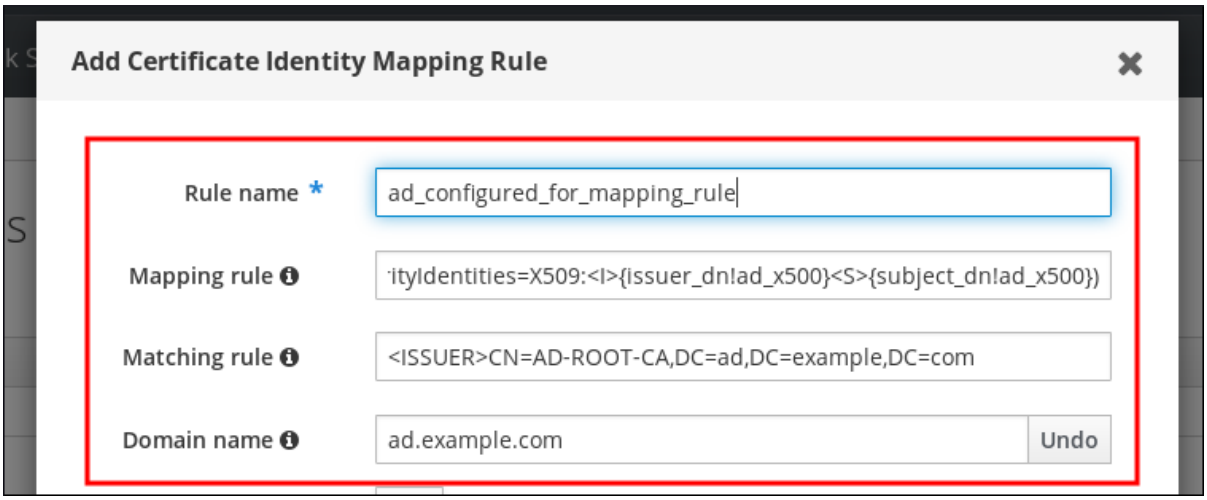
6. Enter the matching rule. For example, to only allow certificates issued by the **AD-ROOT-CA** of the **AD.EXAMPLE.COM** domain to authenticate users to IdM:

```
<ISSUER>CN=AD-ROOT-CA,DC=ad,DC=example,DC=com
```

7. Enter the domain:

```
ad.example.com
```

Figure 11.8. Certificate mapping rule if AD is configured for mapping



8. Click **Add**.

9. The System Security Services Daemon (SSSD) periodically re-reads the certificate mapping rules. To force the newly-created rule to be loaded immediately, restart SSSD in the CLI::

```
# systemctl restart sssd
```

11.4.1.2. Adding a certificate mapping rule in the IdM CLI

1. Obtain the administrator's credentials:

```
# kinit admin
```

2. Enter the mapping rule and the matching rule the mapping rule is based on. For example, to make AD search for the **Issuer** and **Subject** entries in any certificate presented, and only allow certificates issued by the **AD-ROOT-CA** of the **AD.EXAMPLE.COM** domain:

```
# ipa certmaprule-add ad_configured_for_mapping_rule --matchrule
'<ISSUER>CN=AD-ROOT-CA,DC=ad,DC=example,DC=com' --maprule
'(altSecurityIdentities=X509:<I>{issuer_dn!ad_x500}<S>{subject_dn!ad_x500})' --
domain=ad.example.com
----------------------------------------------------
Added Certificate Identity Mapping Rule "ad_configured_for_mapping_rule"
----------------------------------------------------
  Rule name: ad_configured_for_mapping_rule
  Mapping rule: (altSecurityIdentities=X509:<I>{issuer_dn!ad_x500}<S>
{subject_dn!ad_x500})
  Matching rule: <ISSUER>CN=AD-ROOT-CA,DC=ad,DC=example,DC=com
  Domain name: ad.example.com
  Enabled: TRUE
```

3. The System Security Services Daemon (SSSD) periodically re-reads the certificate mapping rules. To force the newly-created rule to be loaded immediately, restart SSSD:

```
# systemctl restart sssd
```

11.4.2. Checking certificate mapping data on the AD side

The **altSecurityIdentities** attribute is the Active Directory (AD) equivalent of **certmapdata** user attribute in IdM. When configuring certificate mapping in IdM in the scenario when a trusted AD domain is configured to map user certificates to user accounts, the IdM system administrator needs to check that the **altSecurityIdentities** attribute is set correctly in the user entries in AD.

To check that AD contains the right information for the user stored in AD, use the **ldapsearch** command.

- For example, to check with the **adserver.ad.example.com** server that the **altSecurityIdentities** attribute is set in the user entry of **ad_user** and that the matchrule stipulates that the certificate that **ad_user** uses to authenticate to AD was issued by **AD-ROOT-CA** of the **ad.example.com** domain and that the subject is **<S>DC=com,DC=example,DC=ad,CN=Users,CN=ad_user**:

```
$ ldapsearch -o ldif-wrap=no -LLL -h adserver.ad.example.com \
-p 389 -D cn=Administrator,cn=users,dc=ad,dc=example,dc=com \
-W -b cn=users,dc=ad,dc=example,dc=com "(cn=ad_user)" \
altSecurityIdentities
Enter LDAP Password:
dn: CN=ad_user,CN=Users,DC=ad,DC=example,DC=com
altSecurityIdentities: X509:<I>DC=com,DC=example,DC=ad,CN=AD-ROOT-
CA<S>DC=com,DC=example,DC=ad,CN=Users,CN=ad_user
```

11.5. CONFIGURING CERTIFICATE MAPPING IF AD USER ENTRY CONTAINS NO CERTIFICATE OR MAPPING DATA

This user story describes the steps necessary for enabling certificate mapping in IdM if the IdM deployment is in trust with Active Directory (AD), the user is stored in AD and the user entry in AD contains neither the whole certificate nor certificate mapping data.

Prerequisites

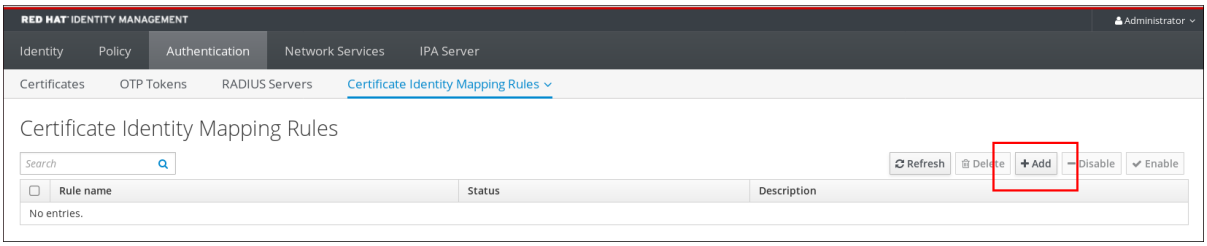
- The user does not have an account in IdM.
- The user has an account in AD which contains neither the whole certificate nor the **altSecurityIdentities** attribute, the AD equivalent of the IdM **certmapdata** atttribute.
- The IdM administrator has the whole AD user certificate to add to the AD user's **user ID override** in IdM.

11.5.1. Adding a certificate mapping rule if the AD user entry contains no certificate or mapping data

11.5.1.1. Adding a certificate mapping rule in the IdM web UI

1. Log into the IdM web UI as an administrator.
2. Navigate to **Authentication → Certificate Identity Mapping Rules → Certificate Identity Mapping Rules**.
3. Click **Add**.

Figure 11.9. Adding a new certificate mapping rule in the IdM web UI



4. Enter the rule name.

5. Enter the mapping rule. To have the whole certificate that is presented to IdM for authentication compared to the certificate stored in the user ID override entry of the AD user entry in IdM:

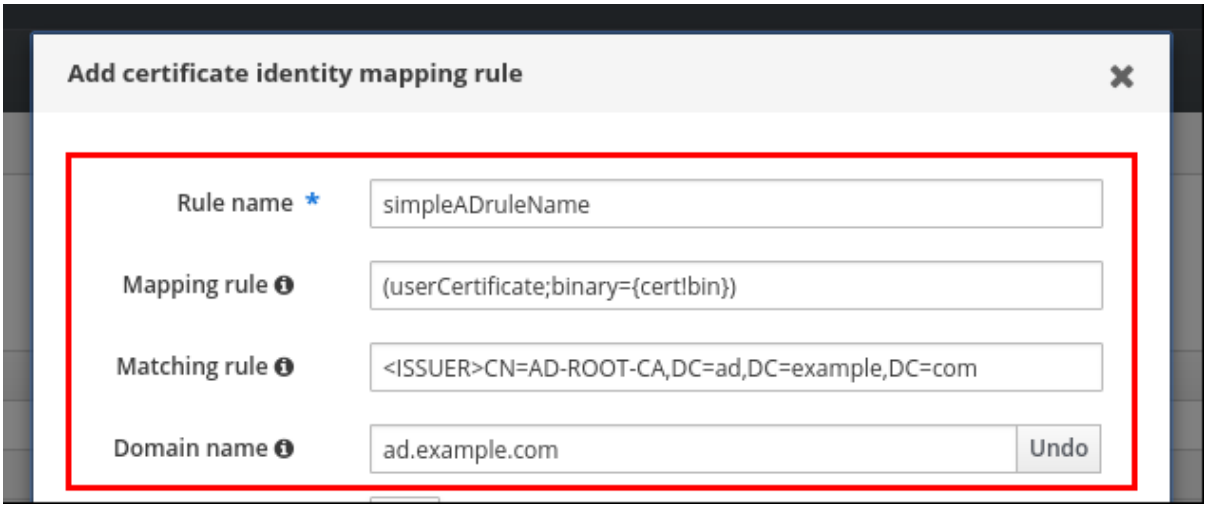
```
(userCertificate;binary={cert!bin})
```

6. Enter the matching rule. For example, to only allow certificates issued by the **AD-ROOT-CA** of the **AD.EXAMPLE.COM** domain to authenticate:

```
<ISSUER>CN=AD-ROOT-CA,DC=ad,DC=example,DC=com
```

7. Enter the domain name. For example, to search for users in the **ad.example.com** domain:

Figure 11.10. Certificate mapping rule for a user with no certificate or mapping data stored in AD



8. Click **Add**.

9. The System Security Services Daemon (SSSD) periodically re-reads the certificate mapping rules. To force the newly-created rule to be loaded immediately, restart SSSD in the CLI:

```
# systemctl restart sssd
```

11.5.1.2. Adding a certificate mapping rule in the IdM CLI

1. Obtain the administrator's credentials:

```
# kinit admin
```

2. Enter the mapping rule and the matching rule the mapping rule is based on. To have the whole certificate that is presented for authentication compared to the certificate stored in the user ID override entry of the AD user entry in IdM, only allowing certificates issued by the **AD-ROOT-CA** of the **AD.EXAMPLE.COM** domain to authenticate:

```
# ipa certmaprule-add simpleADrule --matchrule '<ISSUER>CN=AD-ROOT-CA,DC=ad,DC=example,DC=com' --maprule '(userCertificate;binary={cert!bin})' --domain ad.example.com
----------------------------------------------------
Added Certificate Identity Mapping Rule "simpleADrule"
----------------------------------------------------
  Rule name: simpleADrule
  Mapping rule: (userCertificate;binary={cert!bin})
  Matching rule: <ISSUER>CN=AD-ROOT-CA,DC=ad,DC=example,DC=com
  Domain name: ad.example.com
  Enabled: TRUE
```

3. The System Security Services Daemon (SSSD) periodically re-reads the certificate mapping rules. To force the newly-created rule to be loaded immediately, restart SSSD:

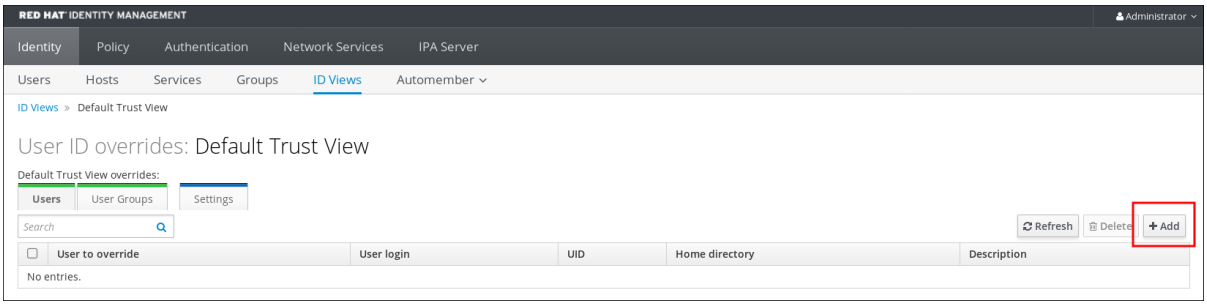
```
# systemctl restart sssd
```

11.5.2. Adding a certificate to an AD user's ID override if the user entry in AD contains no certificate or mapping data

11.5.2.1. Adding a certificate to an AD user's ID override in the IdM web UI

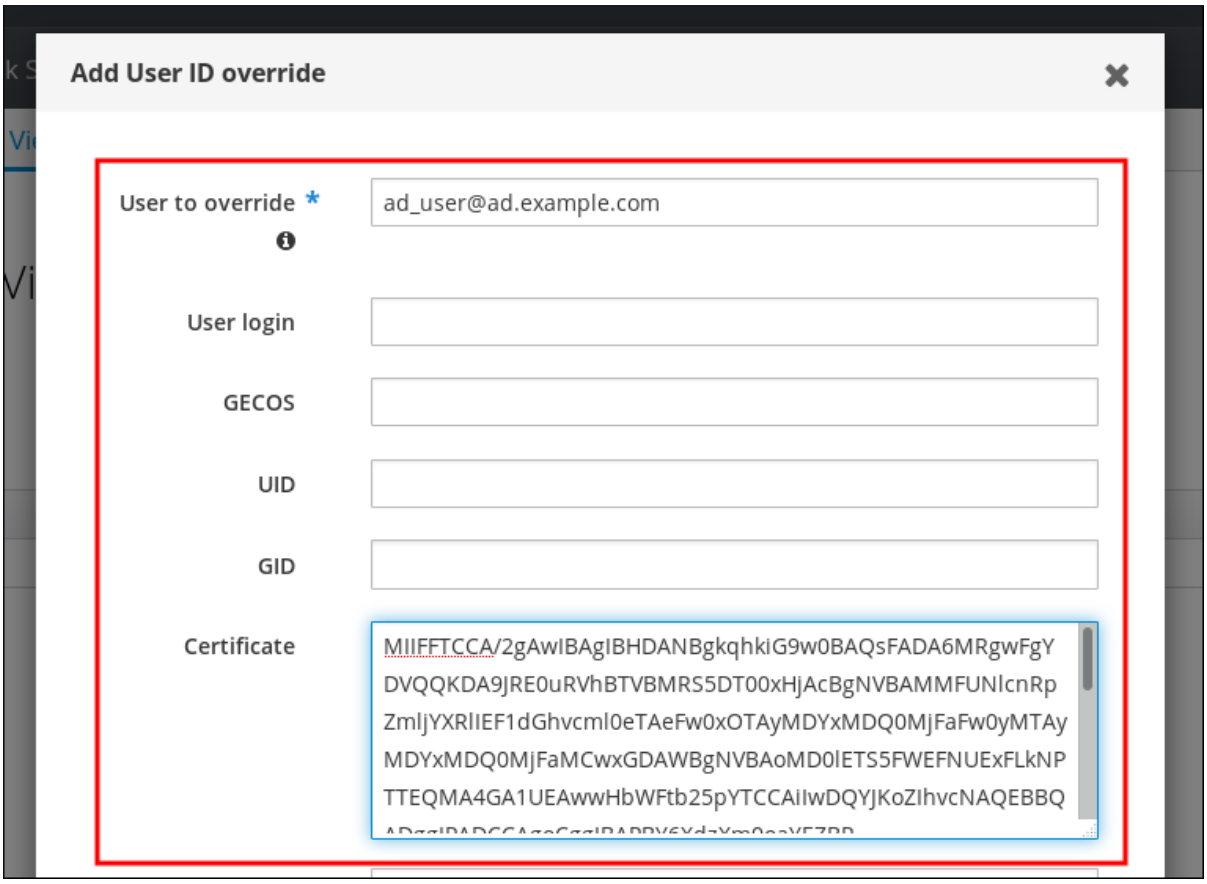
1. Navigate to **Identity → ID Views → Default Trust View**.
2. Click **Add**.

Figure 11.11. Adding a new user ID override in the IdM web UI



3. In the **User to override** field, enter **ad_user@ad.example.com**.
4. Copy and paste the certificate of **ad_user** into the **Certificate** field.

Figure 11.12. Configuring the User ID override for an AD user



5. Click **Add**.

6. Optionally, verify that the user and certificate are linked:

   a. Use the **sss_cache** utility to invalidate the record of **ad_user@ad.example.com** in the SSSD cache and force a reload of the **ad_user@ad.example.com** information:

   ```
   # sss_cache -u ad_user@ad.example.com
   ```

   b. Run the **ipa certmap-match** command with the name of the file containing the certificate of the AD user:

   ```
   # ipa certmap-match ad_user_cert.pem
   --------------
   1 user matched
   --------------
    Domain: AD.EXAMPLE.COM
    User logins: ad_user@ad.example.com
   ----------------------------
   Number of entries returned 1
   ----------------------------
   ```

   The output confirms that you have certificate mapping data added to **ad_user@ad.example.com** and that a corresponding mapping rule defined in Adding a certificate mapping rule if the AD user entry contains no certificate or mapping data exists. This means that you can use any certificate that matches the defined certificate mapping data to authenticate as **ad_user@ad.example.com**.

11.5.2.2. Adding a certificate to an AD user's ID override in the IdM CLI

1. Obtain the administrator's credentials:

```
# kinit admin
```

2. Add the certificate of **ad_user@ad.example.com** to the user account using the **ipa idoverrideuser-add-cert** command:

```
# CERT=`cat ad_user_cert.pem | tail -n +2| head -n -1 | tr -d '\r\n'\`
# ipa idoverrideuser-add-cert ad_user@ad.example.com --certificate $CERT
```

3. Optionally, verify that the user and certificate are linked:

   a. Use the **sss_cache** utility to invalidate the record of **ad_user@ad.example.com** in the SSSD cache and force a reload of the **ad_user@ad.example.com** information:

```
# sss_cache -u ad_user@ad.example.com
```

   b. Run the **ipa certmap-match** command with the name of the file containing the certificate of the AD user:

```
# ipa certmap-match ad_user_cert.pem
--------------
1 user matched
--------------
 Domain: AD.EXAMPLE.COM
 User logins: ad_user@ad.example.com
----------------------------
Number of entries returned 1
----------------------------
```

   The output confirms that you have certificate mapping data added to **ad_user@ad.example.com** and that a corresponding mapping rule defined in Adding a certificate mapping rule if the AD user entry contains no certificate or mapping data exists. This means that you can use any certificate that matches the defined certificate mapping data to authenticate as **ad_user@ad.example.com**.

11.6. COMBINING SEVERAL IDENTITY MAPPING RULES INTO ONE

To combine several identity mapping rules into one combined rule, use the | (or) character to precede the individual mapping rules, and separate them using **()** brackets, for example:

Certificate Mapping Filter Example 1

```
$ ipa certmaprule-add ad_cert_for_ipa_and_ad_users \ --maprule='(|(ipacertmapdata=X509:<I>
{issuer_dn!nss_x500}<S>{subject_dn!nss_x500})(altSecurityIdentities=X509:<I>
{issuer_dn!ad_x500}<S>{subject_dn!ad_x500}))' \ --matchrule='<ISSUER>CN=AD-ROOT-
CA,DC=ad,DC=example,DC=com' \ --domain=ad.example.com
```

In the above example, the filter definition in the **--maprule** option includes these criteria:

- **ipacertmapdata=X509:<I>{issuer_dn!nss_x500}<S>{subject_dn!nss_x500}** is a filter that links the subject and issuer from a smart card certificate to the value of the **ipacertmapdata** attribute in an IdM user account, as described in Adding a certificate mapping rule in IdM

- **altSecurityIdentities=X509:<I>{issuer_dn!ad_x500}<S>{subject_dn!ad_x500}** is a filter that links the subject and issuer from a smart card certificate to the value of the **altSecurityIdentities** attribute in an AD user account, as described in Adding a certificate mapping rule if the trusted AD domain is configured to map user certificates

- The addition of the **--domain=ad.example.com** option means that users mapped to a given certificate are not only searched in the local **idm.example.com** domain but also in the **ad.example.com** domain

The filter definition in the **--maprule** option accepts the logical operator | (or), so that you can specify multiple criteria. In this case, the rule maps all user accounts that meet at least one of the criteria.

Certificate Mapping Filter Example 2

```
$ ipa certmaprule-add ipa_cert_for_ad_users \
  --maprule='(|(userCertificate;binary={cert!bin})(ipacertmapdata=X509:<I>
{issuer_dn!nss_x500}<S>{subject_dn!nss_x500})(altSecurityIdentities=X509:<I>
{issuer_dn!ad_x500}<S>{subject_dn!ad_x500}))' \
  --matchrule='<ISSUER>CN=Certificate Authority,O=REALM.EXAMPLE.COM' \
  --domain=idm.example.com --domain=ad.example.com
```

In the above example, the filter definition in the **--maprule** option includes these criteria:

- **userCertificate;binary={cert!bin}** is a filter that returns user entries that include the whole certificate. For AD users, creating this type of filter is described in detail in Adding a certificate mapping rule if the AD user entry contains no certificate or mapping data.

- **ipacertmapdata=X509:<I>{issuer_dn!nss_x500}<S>{subject_dn!nss_x500}** is a filter that links the subject and issuer from a smart card certificate to the value of the **ipacertmapdata** attribute in an IdM user account, as described in Adding a certificate mapping rule in IdM .

- **altSecurityIdentities=X509:<I>{issuer_dn!ad_x500}<S>{subject_dn!ad_x500}** is a filter that links the subject and issuer from a smart card certificate to the value of the **altSecurityIdentities** attribute in an AD user account, as described in Adding a certificate mapping rule if the trusted AD domain is configured to map user certificates.

The filter definition in the **--maprule** option accepts the logical operator | (or), so that you can specify multiple criteria. In this case, the rule maps all user accounts that meet at least one of the criteria.

CHAPTER 12. ENABLING AD USERS TO ADMINISTER IDM

12.1. ID OVERRIDES FOR AD USERS

In Red Hat Enterprise Linux (RHEL) 7, external group membership allows AD users and groups to access IdM resources in a POSIX environment with the help of the System Security Services Daemon (SSSD).

The IdM LDAP server has its own mechanisms to grant access control. RHEL 8 introduces an update that allows adding an ID user override for an AD user as a member of an IdM group. An ID override is a record describing what a specific Active Directory user or group properties should look like within a specific ID view, in this case the Default Trust View. As a consequence of the update, the IdM LDAP server is able to apply access control rules for the IdM group to the AD user.

AD users are now able to use the self service features of IdM UI, for example to upload their SSH keys, or change their personal data. An AD administrator is able to fully administer IdM without having two different accounts and passwords.

NOTE

Currently, selected features in IdM may still be unavailable to AD users. For example, setting passwords for IdM users as an AD user from the IdM **admins** group might fail.

12.2. USING ID OVERRIDES TO ENABLE AD USERS TO ADMINISTER IDM

Prerequisites

- The **idm:DL1** stream is enabled on your IdM server and you have switched to the RPMs delivered through this stream:

```
# yum module enable idm:DL1
# yum distro-sync
```

- The **idm:DL1/adtrust** profile is installed on your IdM server.

```
# yum module install idm:DL1/adtrust
```

  The profile contains all the packages necessary for installing an IdM server that will have a trust agreement with Active Directory, including the **ipa-idoverride-memberof** package.

- A working Identity Management environment is set up. For details, see Installing Identity Management.

- A working trust between your Identity Management environment and Active Directory is set up.

Procedure

This procedure describes creating and using an ID override for an Active Directory (AD) user to give that user rights identical to those of an Identity Management (IdM) user. During this procedure, work on an IdM server that is configured as a trust controller or a trust agent. For details on trust controllers and trust agents, see *Trust controllers and trust agents* in Planning Identity Management.

1. As an IdM administrator, create an ID override for an AD user in the Default Trust View. For example, to create an ID override for the **ad_user@ad.example.com** user:

```
# kinit admin
# ipa idoverrideuser-add 'default trust view' ad_user@ad.example.com
```

2. Add the ID override from the Default Trust View as a member to an IdM group. If the group in question is a member of an IdM role, the AD user represented by the ID override will gain all permissions granted by the role when using the IdM API, including both the command line interface and the IdM web UI. For example, to add the ID override for the **ad_user@ad.example.com** user to the **admins** group:

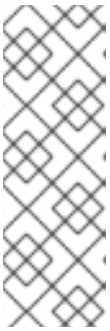
```
# ipa group-add-member admins --idoverrideusers=ad_user@ad.example.com
```

12.3. MANAGING IDM COMMAND-LINE INTERFACE (CLI) AS AN AD USER

This procedure checks that an Active Directory user can log into Identity Management CLI and run commands appropriate for his role.

1. Destroy the current Kerberos ticket of the IdM administrator:

```
# kdestroy -A
```



NOTE

The destruction of the Kerberos ticket is required because the GSSAPI implementation in MIT Kerberos chooses credentials from the realm of the target service by preference, which in this case is the IdM realm. This means that if a credentials cache collection, namely the KCM:, KEYRING:, or DIR: type of credentials cache is in use, a previously obtained **admin** or any other IdM principal's credentials will be used to access the IdM API instead of the AD user's credentials.

2. Obtain the Kerberos credentials of the AD user for whom an ID override has been created:

```
# kinit ad_user@AD.EXAMPLE.COM
Password for ad_user@AD.EXAMPLE.COM:
```

3. Test that the ID override of the AD user enjoys the same privileges stemming from membership in the IdM group as any IdM user in that group. If the ID override of the AD user has been added to the **admins** group, the AD user can, for example, create groups in IdM:

```
# ipa group-add some-new-group
---------------------------
Added group "some-new-group"
---------------------------
  Group name: some-new-group
  GID: 1997000011
```