



Red Hat Directory Server 12

Installing Red Hat Directory Server

Instructions for managing a Directory Server installation, update, and uninstallation.
Basic tasks you need to start working with an instance

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Instructions for managing a Directory Server installation, update, and uninstallation. Basic tasks you need to start working with an instance

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Abstract

Install, update, and uninstall Directory Server 12 and associated services by using the command line or the web console. Learn how to run an instance in FIPS mode, create test entries, log into the web console, start and stop Directory Server instances, and change the LDAP and LDAPS port numbers.

Table of Contents

PROVIDING FEEDBACK ON RED HAT DOCUMENTATION	4
CHAPTER 1. SETTING UP A NEW INSTANCE ON THE COMMAND LINE USING A .INF FILE	5
1.1. PREREQUISITES	5
1.2. INSTALLING THE DIRECTORY SERVER PACKAGES	5
1.3. CREATING A .INF FILE FOR A DIRECTORY SERVER INSTANCE INSTALLATION	6
1.4. USING A .INF FILE TO SET UP A NEW DIRECTORY SERVER INSTANCE	7
CHAPTER 2. SETTING UP A NEW INSTANCE ON THE COMMAND LINE USING THE INTERACTIVE INSTALLER	9
2.1. PREREQUISITES	9
2.2. INSTALLING THE DIRECTORY SERVER PACKAGES	9
2.3. CREATING AN INSTANCE USING THE INTERACTIVE INSTALLER	10
CHAPTER 3. SETTING UP A NEW INSTANCE USING THE WEB CONSOLE	12
3.1. PREREQUISITES	12
3.2. USING THE WEB CONSOLE TO SET UP A NEW DIRECTORY SERVER INSTANCE	12
CHAPTER 4. SETTING UP A NEW INSTANCE AS A NON-ROOT USER	14
4.1. PREPARING THE ENVIRONMENT TO INSTALL DIRECTORY SERVER AS A USER	14
4.2. INSTALLING A NEW INSTANCE AS NON-ROOT USER	15
CHAPTER 5. INSTALLING DIRECTORY SERVER WITH KERBEROS AUTHENTICATION BEHIND A LOAD BALANCER	17
5.1. PREREQUISITES	17
5.2. INSTALLING THE DIRECTORY SERVER PACKAGES	17
5.3. CREATING A .INF FILE FOR A DIRECTORY SERVER INSTANCE INSTALLATION	18
5.4. USING A .INF FILE TO SET UP A NEW DIRECTORY SERVER INSTANCE	19
5.5. CREATING A KEYTAB FOR THE LOAD BALANCER AND CONFIGURING DIRECTORY SERVER TO USE THE KEYTAB	20
CHAPTER 6. RUNNING DIRECTORY SERVER IN FIPS MODE	22
6.1. ENABLING THE FIPS MODE	22
6.2. ADDITIONAL RESOURCES	22
CHAPTER 7. UPDATING DIRECTORY SERVER TO A NEW MINOR VERSION	23
7.1. UPDATING THE DIRECTORY SERVER PACKAGES	23
CHAPTER 8. MIGRATING DIRECTORY SERVER 11 TO DIRECTORY SERVER 12	24
8.1. PREREQUISITES	24
8.2. MIGRATING TO DIRECTORY SERVER 12 USING THE REPLICATION METHOD	24
8.3. MIGRATING TO DIRECTORY SERVER 12 USING THE EXPORT AND IMPORT METHOD	25
CHAPTER 9. MIGRATING DIRECTORY SERVER 10 TO DIRECTORY SERVER 12	28
9.1. PREREQUISITES	28
9.2. MIGRATING DIRECTORY SERVER 10 TO VERSION 12 USING THE REPLICATION METHOD	28
9.3. MIGRATING DIRECTORY SERVER 10 TO VERSION 12 USING THE EXPORT AND IMPORT METHOD	29
CHAPTER 10. INSTALLING, UPDATING, AND UNINSTALLING THE PASSWORD SYNCHRONIZATION SERVICE	32
10.1. THE PASSWORD SYNCHRONIZATION SERVICE	32
10.2. DOWNLOADING THE PASSWORD SYNCHRONIZATION SERVICE INSTALLER	32
10.3. INSTALLING THE PASSWORD SYNCHRONIZATION SERVICE	33
10.4. UPDATING THE PASSWORD SYNCHRONIZATION SERVICE	34
10.5. UNINSTALLING THE PASSWORD SYNCHRONIZATION SERVICE	35

CHAPTER 11. REMOVING A DIRECTORY SERVER INSTANCE	36
11.1. REMOVING AN INSTANCE USING THE COMMAND LINE	36
11.2. REMOVING AN INSTANCE USING THE WEB CONSOLE	36
CHAPTER 12. UNINSTALLING DIRECTORY SERVER	38
12.1. UNINSTALLING DIRECTORY SERVER	38
CHAPTER 13. LOGGING IN TO THE DIRECTORY SERVER BY USING THE WEB CONSOLE	40
CHAPTER 14. STARTING AND STOPPING A DIRECTORY SERVER INSTANCE	41
14.1. STARTING AND STOPPING A DIRECTORY SERVER INSTANCE BY USING THE COMMAND LINE	41
14.2. STARTING AND STOPPING A DIRECTORY SERVER INSTANCE BY USING THE WEB CONSOLE	42
CHAPTER 15. CHANGING THE LDAP AND LDAPS PORT NUMBERS	44
15.1. CHANGING THE PORT NUMBERS USING THE COMMAND LINE	44
15.2. CHANGING THE PORT NUMBERS USING THE WEB CONSOLE	45
CHAPTER 16. MANAGING DEFAULT OPTIONS FOR DIRECTORY SERVER COMMAND-LINE UTILITIES USING .DSRC FILE	46
16.1. HOW A .DSRC FILE SIMPLIFIES COMMANDS	46
16.2. USING THE DSCTL UTILITY TO CREATE A .DSRC FILE	46
16.3. REMOTE AND LOCAL CONNECTION RESOLUTION WHEN USING DIRECTORY SERVER UTILITIES	48
CHAPTER 17. CREATING TEST ENTRIES	49
17.1. OVERVIEW OF TESTING ENTRIES YOU CAN CREATE	49
17.2. CREATING AN LDIF FILE WITH EXAMPLE USER ENTRIES	49
17.3. CREATING AN LDIF FILE WITH EXAMPLE GROUP ENTRIES	50
17.4. CREATING AN LDIF FILE WITH AN EXAMPLE COS DEFINITION	50
17.5. CREATING AN LDIF FILE WITH EXAMPLE MODIFICATION STATEMENTS	51
17.6. CREATING AN LDIF FILE WITH NESTED EXAMPLE ENTRIES	52

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CHAPTER 1. SETTING UP A NEW INSTANCE ON THE COMMAND LINE USING A .INF FILE

When you set up Directory Server using a **.inf** file on the command line you can customize advanced settings. For example, you can customize in the **.inf** file the following settings:

- The user and group the **ns-slapd** Directory Server process uses after the service has started. Note that, if you use a different user and group, you must manually create the user and group before you start the installation.
- Paths, such as the configuration, backup, and data directory.
- Certificate validity.

1.1. PREREQUISITES

- The server meets the requirements of the latest Red Hat Directory Server version as described in the [Red Hat Directory Server 12 Release Notes](#).

1.2. INSTALLING THE DIRECTORY SERVER PACKAGES

Use the following procedure to install the Directory Server packages.

Prerequisites

- You registered the system to the Red Hat Subscription Management service.
- You have a valid Red Hat Directory Server subscription in your Red Hat account.
- The RHEL default repositories, **BaseOS** and **AppStream**, are enabled.

Procedure

1. If your account has disabled Simple Content Access (SCA):
 - a. List the available subscriptions in your Red Hat account that provide a Red Hat Directory Server subscription, and note the pool ID:

```
# subscription-manager list --all --available --matches 'Red Hat Directory Server'
...
Subscription Name: Example Subscription
Provides:          ...
                  Red Hat Directory Server
...
Pool ID:           5ab6a8df96b03fd30aba9a9c58da57a1
Available:        1
...
```

- b. Attach the Red Hat Directory Server subscription to the system using its pool ID:

```
# subscription-manager attach --pool=5ab6a8df96b03fd30aba9a9c58da57a1
Successfully attached a subscription for: Example Subscription
```

2. Enable the Directory Server repository. For example, to enable the Directory Server 12.4 repository, run:

```
# subscription-manager repos --enable=dirsrv-12.4-for-rhel-9-x86_64-rpms
Repository 'dirsrv-12.4-for-rhel-9-x86_64-rpms' is enabled for this system.
```

3. Install the **redhat-ds:12** module:

```
# dnf module install redhat-ds:12
```

This command automatically installs all required dependencies.

Additional resources

- [Using Red Hat Subscription Manager](#)
- [Simple Content Access](#)
- [What are the names of the Red Hat repositories that have to be enabled](#)

1.3. CREATING A .INF FILE FOR A DIRECTORY SERVER INSTANCE INSTALLATION

Create a **.inf** file for the **dscreate** utility, and adjust the file to your environment. In a later step, you will use this file to create the new Directory Server instance.

Prerequisites

- You installed the **redhat-ds:12** module.

Procedure

1. Use the **dscreate create-template** command to create a template **.inf** file. For example, to store the template in the **/root/instance_name.inf** file, enter:

```
# dscreate create-template /root/instance_name.inf
```

The created file contains all available parameters including descriptions.

2. Edit the file that you created in the previous step:
 - a. Uncomment the parameters that you want to set to customize the installation. All parameters have defaults. However, Red Hat recommends that you customize certain parameters for a production environment. For example, set at least the following parameters in the **[slapd]** section:

```
instance_name = instance_name
root_password = password
```

- b. To automatically create a suffix during instance creation, set the following parameters in the **[backend-userroot]** section:

```
create_suffix_entry = True
suffix = dc=example,dc=com
```



IMPORTANT

If you do not create a suffix during instance creation, you must create it later manually before you can store data in this instance.

- c. Optional: Uncomment other parameters and set them to appropriate values for your environment. For example, use these parameters to specify replication options, such as authentication credentials and changelog trimming, or set different ports for the LDAP and LDAPS protocols.



NOTE

By default, new instances that you create include a self-signed certificate and TLS enabled. For increased security, Red Hat recommends that you do not disable this feature. Note that you can replace the self-signed certificate with a certificate issued by a Certificate Authority (CA) at a later date.

Additional resources

- [Enabling TLS-encrypted connections to Directory Server](#)

1.4. USING A .INF FILE TO SET UP A NEW DIRECTORY SERVER INSTANCE

This section describes how to use a **.inf** file to set up a new Directory Server instance using the command line.

Prerequisites

- You created a **.inf** file for the Directory Server instance.

Procedure

1. Pass the **.inf** file to the **dscreate from-file** command to create the new instance:

```
# dscreate from-file /root/instance_name.inf
Starting installation ...
Validate installation settings ...
Create file system structures ...
Create self-signed certificate database ...
Perform SELinux labeling ...
Perform post-installation tasks ...
Completed installation for instance: slapd-instance_name
```

The **dscreate** utility automatically starts the instance and configures RHEL to start the service when the system boots.

2. Open the required ports in the firewall:

```
# firewall-cmd --permanent --add-port={389/tcp,636/tcp}
```

3. Reload the firewall configuration:

```
# firewall-cmd --reload
```

CHAPTER 2. SETTING UP A NEW INSTANCE ON THE COMMAND LINE USING THE INTERACTIVE INSTALLER

Administrators can use the Directory Server interactive installer to set up a new instance by answering questions about the configuration for the new instance.

If you want to customize additional settings during the installation, use a **.inf** file instead of the interactive installer. For details, see [Chapter 1, Setting up a new instance on the command line using a .inf file](#).

2.1. PREREQUISITES

- The server meets the requirements of the latest Red Hat Directory Server version as described in the [Red Hat Directory Server 12 Release Notes](#).

2.2. INSTALLING THE DIRECTORY SERVER PACKAGES

Use the following procedure to install the Directory Server packages.

Prerequisites

- You registered the system to the Red Hat Subscription Management service.
- You have a valid Red Hat Directory Server subscription in your Red Hat account.
- The RHEL default repositories, **BaseOS** and **AppStream**, are enabled.

Procedure

1. If your account has disabled Simple Content Access (SCA):
 - a. List the available subscriptions in your Red Hat account that provide a Red Hat Directory Server subscription, and note the pool ID:

```
# subscription-manager list --all --available --matches 'Red Hat Directory Server'
...
Subscription Name: Example Subscription
Provides:          ...
                  Red Hat Directory Server
...
Pool ID:           5ab6a8df96b03fd30aba9a9c58da57a1
Available:        1
...
```

- b. Attach the Red Hat Directory Server subscription to the system using its pool ID:

```
# subscription-manager attach --pool=5ab6a8df96b03fd30aba9a9c58da57a1
Successfully attached a subscription for: Example Subscription
```

2. Enable the Directory Server repository. For example, to enable the Directory Server 12.4 repository, run:

```
# subscription-manager repos --enable=dirsrv-12.4-for-rhel-9-x86_64-rpms
Repository 'dirsrv-12.4-for-rhel-9-x86_64-rpms' is enabled for this system.
```

3. Install the **redhat-ds:12** module:

```
# dnf module install redhat-ds:12
```

This command automatically installs all required dependencies.

Additional resources

- [Using Red Hat Subscription Manager](#)
- [Simple Content Access](#)
- [What are the names of the Red Hat repositories that have to be enabled](#)

2.3. CREATING AN INSTANCE USING THE INTERACTIVE INSTALLER

This section explains how to use the interactive installer to create a new Directory Server instance.

Procedure

1. Start the interactive installer:

```
# dscreate interactive
```

2. Answer the questions of the interactive installer.

To use the default values displayed in square brackets behind most questions in the installer, press **Enter** without entering a value.

```
Install Directory Server (interactive mode)
=====

Enter system's hostname [server.example.com]:

Enter the instance name [server]: instance_name

Enter port number [389]:

Create self-signed certificate database [yes]:

Enter secure port number [636]:

Enter Directory Manager DN [cn=Directory Manager]:

Enter the Directory Manager password: password
Confirm the Directory Manager Password: password

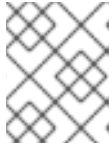
Enter the database suffix (or enter "none" to skip) [dc=server,dc=example,dc=com]:
dc=example,dc=com

Create sample entries in the suffix [no]:
```

Create just the top suffix entry [no]: **yes**

Do you want to start the instance after the installation? [yes]:

Are you ready to install? [no]: **yes**



NOTE

Instead of setting a password in clear text you can set a ***{algorithm}hash*** string generated by the **pwdhash** utility.

3. Open the required ports in the firewall:

```
# firewall-cmd --permanent --add-port={389/tcp,636/tcp}
```

4. Reload the firewall configuration:

```
# firewall-cmd --reload
```

CHAPTER 3. SETTING UP A NEW INSTANCE USING THE WEB CONSOLE

If you prefer a browser-based interface to set up Directory Server, you can use the Directory Server web console.

3.1. PREREQUISITES

- The server meets the requirements of the latest Red Hat Directory Server version as described in the [Red Hat Directory Server 12 Release Notes](#).
- You installed the Directory Server packages as described in [Installing the Directory Server packages](#)

3.2. USING THE WEB CONSOLE TO SET UP A NEW DIRECTORY SERVER INSTANCE

This section describes how to use the web console to set up a new Directory Server instance.

Prerequisites

- The **cockpit** web console package is installed.
- The **cockpit.socket** systemd unit is enabled and started.
- You opened port **9090** in the local firewall to allow accessing the web console.

Procedure

1. Use a browser to connect to the web console running on port 9090 on the Directory Server host:

https://server.example.com:9090

2. Log in as the **root** user or as a user with sudo privileges.
3. Select the **Red Hat Directory Server** entry.
4. Create a new instance:
 - If no instance exists on the server, click the **Create New Instance** button.
 - If the server already runs existing instances, select **Actions** and click **Create New Instance**.
5. Complete the fields of the **Create New Server Instance** form:
 - **Instance Name:** Sets the name of the instance. Note that you cannot change the name of an instance after it has been created.
 - **Port:** Sets the port number of the LDAP protocol. The port must not be in use by another instance or service. The default port is 389.
 - **Secure Port:** Sets the port number of the LDAPS protocol. The port must not be in use by another instance or service. The default port is 636.

- **Create Self-Signed TLS Certificate DB:** Enables TLS encryption in the instance, and creates a self-signed certificate.
For increased security, Red Hat recommends that you create the new instance with the self-signed certificate and TLS enabled. Note that you can replace the self-signed certificate with a certificate issued by a Certificate Authority (CA) at a later date.
- **Directory Manager DN:** Sets the distinguished name (DN) of the administrative user of the instance. The default value is **cn=Directory Manager**.
- **Directory Manager Password:** Sets the password of the administrative user of the instance.
- **Confirm Password:** Must be set to the same value as in the **Directory Manager Password** field.
- **Create Database:** Select this field to automatically create a suffix during instance creation.



IMPORTANT

If you do not create a suffix during instance creation, you must create it later manually before you can store data in this instance.

If you enabled this option, fill the addition fields:

- **Database Suffix:** Sets the suffix for the back end.
 - **Database Name:** Sets the name of the back end database.
 - **Database Initialization:** Set this field to **Create Suffix Entry**.
6. Click **Create Instance**.
The new instance starts and is configured to start automatically when the system boots.
 7. Open the required ports in the firewall:

```
# firewall-cmd --permanent --add-port={389/tcp,636/tcp}
```

8. Reload the firewall configuration:

```
# firewall-cmd --reload
```

Additional resources

- [Enabling TLS-encrypted connections to Directory Server](#)

CHAPTER 4. SETTING UP A NEW INSTANCE AS A NON-ROOT USER

If you do not have **root** permissions, you can perform the Directory Server installation as a user. Use this method to test Directory Server and develop LDAP applications. However, note that instances running by a **non-root** user have limitations, such as:

- They do not support Simple Network Management Protocol (SNMP).
- They can use only ports higher or equal to 1024.

4.1. PREPARING THE ENVIRONMENT TO INSTALL DIRECTORY SERVER AS A USER

Without **root** permissions, before you can create and administer Directory Server instances, you need to prepare a proper environment using the **dscreate ds-root** command.

Prerequisites

- You installed the Directory Server packages as a **root** user.

Procedure

1. Ensure you have **\$HOME/bin** in your PATH variable. If not:
 - a. Append the following to the **~/.bash_profile** file:

```
PATH="$HOME/bin:$PATH"
```

- b. Re-read the **~/.bash_profile** file:

```
$ source ~/.bash_profile
```

2. Configure the environment for an instance creation to use the custom location:

```
$ dscreate ds-root $HOME/dsroot $HOME/bin
```

This command replaces the standard installation paths with **\$HOME/dsroot/** and creates a copy of the standard Directory Server administration utilities in the **\$HOME/bin/** directory.

3. To make the shell use new paths:
 - a. Clear the cache:

```
$ hash -r dscreate
```

- b. Verify that the shell uses the correct path to the command:

```
$ which dscreate  
~/bin/dscreate
```

For the **dscreate** command, the shell now uses the **\$HOME/bin/dscreate** instead of **/usr/bin/dscreate**.

4.2. INSTALLING A NEW INSTANCE AS NON-ROOT USER

To install Directory Server without **root** permissions, you can use the interactive installer. After the installation, Directory Server creates an instance in the custom location and a user can run **dscreate**, **dsctl**, **dsconf** utilities as usual.

Prerequisites

- You prepared the environment for non-root installation.
- You have **sudo** permissions to use the **firewall-cmd** utility If you want to make the Directory Server instance available from the outside.

Procedure

1. Create an instance using the interactive installer

- a. Start the interactive installer:

```
$ dscreate interactive
```

- b. Answer the questions of the interactive installer.

To use the default values displayed in square brackets behind most questions in the installer, press **Enter** without entering a value.



NOTE

During the installation, you must choose the instance port and secure port number **higher than 1024** (for example, 1389 and 1636). Otherwise, a user does not have permissions to bind to a privileged port (1-1023).

```
Install Directory Server (interactive mode)
```

```
=====
```

```
Non privileged user cannot use semanage, will not relabel ports or files.
```

```
Selinux support will be disabled, continue? [yes]: yes
```

```
Enter system's hostname [server.example.com]:
```

```
Enter the instance name [server]: instance_name
```

```
Enter port number [389]: 1389
```

```
Create self-signed certificate database [yes]:
```

```
Enter secure port number [636]: 1636
```

```
Enter Directory Manager DN [cn=Directory Manager]:
```

```
Enter the Directory Manager password: password
```

```
Confirm the Directory Manager Password: password
```

```
Enter the database suffix (or enter "none" to skip) [dc=server,dc=example,dc=com]:  
dc=example,dc=com
```

```
Create sample entries in the suffix [no]:
```

```
Create just the top suffix entry [no]: yes
```

```
Do you want to start the instance after the installation? [yes]:
```

```
Are you ready to install? [no]: yes
```



NOTE

Instead of setting a password in clear text you can set a **{algorithm}hash** string generated by the **pwdhash** utility.

2. Optional: If you want to make the Directory Server instance available from the outside:
 - a. Open the ports in the firewall:

```
# sudo firewall-cmd --permanent --add-port={1389/tcp,1636/tcp}
```

- b. Reload the firewall configuration:

```
# sudo firewall-cmd --reload
```

Verification

- Run **ldapsearch** command to test that a user can connect to the instance:

```
$ ldapsearch -D "cn=Directory Manager" -W -H ldap://server.example.com:1389 -b "dc=example,dc=com" -s sub -x "(objectclass=*)"
```

Additional resources

- [Preparing the environment for non root user installation](#)
- [How to bind ports below 1024 with non-root privilege](#)

CHAPTER 5. INSTALLING DIRECTORY SERVER WITH KERBEROS AUTHENTICATION BEHIND A LOAD BALANCER

Installing Directory Server instances that work behind a load balancer and support Kerberos authentication require additional steps compared during the installation.

If a user accesses a service using Generic Security Services API (GSSAPI), the Kerberos principal includes the DNS name of the service's host. In case the user connects to a load balancer, the principal contains the DNS name of the load balancer, for example:

ldap/loadbalancer.example.com@EXAMPLE.COM, and not the DNS name of the Directory Server instance.

To facilitate successful connection, the Directory Server instance that receives the request must use the same name as the load balancer, even if the load balancer DNS name is different.

This section describes how to set up an Directory Server instance with Kerberos authentication support behind a load balancer.

5.1. PREREQUISITES

- The server meets the requirements of the latest Red Hat Directory Server version as described in the [Red Hat Directory Server 12 Release Notes](#).

5.2. INSTALLING THE DIRECTORY SERVER PACKAGES

Use the following procedure to install the Directory Server packages.

Prerequisites

- You registered the system to the Red Hat Subscription Management service.
- You have a valid Red Hat Directory Server subscription in your Red Hat account.
- The RHEL default repositories, **BaseOS** and **AppStream**, are enabled.

Procedure

1. If your account has disabled Simple Content Access (SCA):
 - a. List the available subscriptions in your Red Hat account that provide a Red Hat Directory Server subscription, and note the pool ID:

```
# subscription-manager list --all --available --matches 'Red Hat Directory Server'
...
Subscription Name: Example Subscription
Provides:          ...
                  Red Hat Directory Server
...
Pool ID:           5ab6a8df96b03fd30aba9a9c58da57a1
Available:        1
...
```

- b. Attach the Red Hat Directory Server subscription to the system using its pool ID:

```
# subscription-manager attach --pool=5ab6a8df96b03fd30aba9a9c58da57a1
Successfully attached a subscription for: Example Subscription
```

2. Enable the Directory Server repository. For example, to enable the Directory Server 12.4 repository, run:

```
# subscription-manager repos --enable=dirsrv-12.4-for-rhel-9-x86_64-rpms
Repository 'dirsrv-12.4-for-rhel-9-x86_64-rpms' is enabled for this system.
```

3. Install the **redhat-ds:12** module:

```
# dnf module install redhat-ds:12
```

This command automatically installs all required dependencies.

Additional resources

- [Using Red Hat Subscription Manager](#)
- [Simple Content Access](#)
- [What are the names of the Red Hat repositories that have to be enabled](#)

5.3. CREATING A .INF FILE FOR A DIRECTORY SERVER INSTANCE INSTALLATION

Create a **.inf** file for the **dscreate** utility, and adjust the file to your environment. In a later step, you will use this file to create the new Directory Server instance.

Prerequisites

- You installed the **redhat-ds:12** module.

Procedure

1. Use the **dscreate create-template** command to create a template **.inf** file. For example, to store the template in the **/root/instance_name.inf** file, enter:

```
# dscreate create-template /root/instance_name.inf
```

The created file contains all available parameters including descriptions.

2. Edit the file that you created in the previous step:
 - a. Uncomment the parameters that you want to set to customize the installation. All parameters have defaults. However, Red Hat recommends that you customize certain parameters for a production environment. For example, set at least the following parameters in the **[slapd]** section:

```
instance_name = instance_name
root_password = password
```

- b. To use the instance behind a load balancer with GSSAPI authentication, set the **full_machine_name** parameter in the **[general]** section to the fully-qualified domain name (FQDN) of the load balancer instead of the FQDN of the Directory Server host:

```
full_machine_name = loadbalancer.example.com
```

- c. Uncomment the **strict_host_checking** parameter in the **[general]** section and set it to **False**:

```
strict_host_checking = False
```

- d. To automatically create a suffix during instance creation, set the following parameters in the **[backend-userroot]** section:

```
create_suffix_entry = True  
suffix = dc=example,dc=com
```



IMPORTANT

If you do not create a suffix during instance creation, you must create it later manually before you can store data in this instance.

- e. Optional: Uncomment other parameters and set them to appropriate values for your environment. For example, use these parameters to specify replication options, such as authentication credentials and changelog trimming, or set different ports for the LDAP and LDAPS protocols.



NOTE

By default, new instances that you create include a self-signed certificate and TLS enabled. For increased security, Red Hat recommends that you do not disable this feature. Note that you can replace the self-signed certificate with a certificate issued by a Certificate Authority (CA) at a later date.

Additional resources

- [Enabling TLS-encrypted connections to Directory Server](#)

5.4. USING A .INF FILE TO SET UP A NEW DIRECTORY SERVER INSTANCE

This section describes how to use a **.inf** file to set up a new Directory Server instance using the command line.

Prerequisites

- You created a **.inf** file for the Directory Server instance.

Procedure

1. Pass the **.inf** file to the **dscreate from-file** command to create the new instance:

```
# dscreate from-file /root/instance_name.inf
Starting installation ...
Validate installation settings ...
Create file system structures ...
Create self-signed certificate database ...
Perform SELinux labeling ...
Perform post-installation tasks ...
Completed installation for instance: slapd-instance_name
```

The **dscreate** utility automatically starts the instance and configures RHEL to start the service when the system boots.

2. Open the required ports in the firewall:

```
# firewall-cmd --permanent --add-port={389/tcp,636/tcp}
```

3. Reload the firewall configuration:

```
# firewall-cmd --reload
```

5.5. CREATING A KEYTAB FOR THE LOAD BALANCER AND CONFIGURING DIRECTORY SERVER TO USE THE KEYTAB

Before user can authenticate to Directory Server behind a load balancer using GSSAPI, you must create a Kerberos principal for the load balancer and configure Directory Server to use the Kerberos principal. This section describes this procedure.

Prerequisites

- An instance that contains the following **.inf** file configuration:
 - The **full_machine_name** parameter set to the DNS name of the load balancer.
 - The **strict_host_checking** parameter set to **False**.

Procedure

1. Create the Kerberos principal for the load balancer, for example **ldap/loadbalancer.example.com @_EXAMPLE.COM**. The procedure to create the service principal depends on your Kerberos installation. For details, see your Kerberos server's documentation.
2. Optional: You can add further principals to the keytab file. For example, to enable users to connect to the Directory Server instance behind the load balancer directly using Kerberos authentication, add additional principals for the Directory Server host. For example, **ldap/server1.example.com@EXAMPLE.COM**.
3. Copy the service keytab file to the Directory Server host, and store it, for example, in the **/etc/dirsrv/slapd-instance_name/ldap.keytab** file.
4. Add the path to the service keytab to the **/etc/sysconfig/slapd-instance_name** file:

```
KRB5_KTNAME=/etc/dirsrv/slapd-instance_name/ldap.keytab
```


5. Restart the Directory Server instance:

```
# dsctl instance_name restart
```

Verification

- Verify that you can connect to the load balancer using the GSSAPI protocol:

```
# ldapsearch -H ldap://loadbalancer.example.com -Y GSSAPI
```

If you added additional Kerberos principals to the keytab file, such as for the Directory Server host itself, also verify these connections:

```
# ldapsearch -H ldap://server1.example.com -Y GSSAPI
```

CHAPTER 6. RUNNING DIRECTORY SERVER IN FIPS MODE

Directory Server fully supports the Federal Information Processing Standard (FIPS) 140-2. When you run Directory Server in FIPS mode, security-related settings change. For example, SSL is automatically disabled and only TLS 1.2 and 1.3 encryption is used.

6.1. ENABLING THE FIPS MODE

To use Directory Server in Federal Information Processing Standard (FIPS) mode, enable the mode in RHEL and Directory Server.

Prerequisites

- You enabled the FIPS mode in RHEL.

Procedure

1. Enable the FIPS mode for the network security services (NSS) database:

```
# modutil -dbdir /etc/dirsrv/slaped-instance_name -fips true
```

2. Restart the instance:

```
# dsctl instance_name restart
```

Verification

- Verify that FIPS mode is enabled for the NSS database:

```
# modutil -dbdir /etc/dirsrv/slaped-instance_name -chkfips true  
FIPS mode enabled.
```

The command returns **FIPS mode enabled**, if the module is in FIPS mode.

6.2. ADDITIONAL RESOURCES

- [Federal Information Processing Standard \(FIPS\)](#)
- [Switching the system to FIPS mode](#)

CHAPTER 7. UPDATING DIRECTORY SERVER TO A NEW MINOR VERSION

Red Hat frequently releases updated versions of Red Hat Directory Server 12. This section describes how to update the Directory Server packages.

If you instead want to migrate Red Hat Directory Server 11 to version 12, see [Migrating Directory Server 11 to Directory Server 12](#).

7.1. UPDATING THE DIRECTORY SERVER PACKAGES

Use the **dnf** utility to update the module, which also automatically updates the related packages. The following procedure updates Directory Server from version 12.3 to 12.4.

Prerequisites

- Red Hat Directory Server 12.3 is installed on the server.
- You have a valid Red Hat Directory Server subscription in your Red Hat account.

Procedure

1. Disable the Directory Server 12.3 repository:

```
# subscription-manager repos --disable dirsrv-12.3-for-rhel-9-x86_64-rpms
Repository 'dirsrv-12.3-for-rhel-9-x86_64-rpms' is disabled for this system.
```

2. Enable the Directory Server 12.4 repository:

```
# subscription-manager repos --enable=dirsrv-12.4-for-rhel-9-x86_64-rpms
Repository 'dirsrv-12.4-for-rhel-9-x86_64-rpms' is enabled for this system.
```

3. Update the Directory Server packages:

```
# dnf module update redhat-ds
```

The **dnf module update redhat-ds** command updates Directory Server packages and their dependencies to version 12.4.

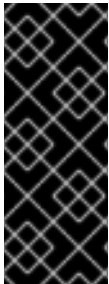
The update process automatically restarts the **dirsrv** services for all instances on the server.

Additional resources

- [What are the names of the Red Hat repositories that have to be enabled](#)

CHAPTER 8. MIGRATING DIRECTORY SERVER 11 TO DIRECTORY SERVER 12

Learn about migrating from Red Hat Directory Server 11 to 12, including tasks that you must perform before the migration begins.



IMPORTANT

Red Hat supports migration only from Red Hat Directory Server 10 or 11 to version 12. To migrate Directory Server from earlier version, you must perform incremental migrations to Directory Server 10 or 11.

Red Hat **does not** support an in-place upgrade of Directory Server 10 or 11 servers to version 12 by using the **leapp** upgrade tool.

8.1. PREREQUISITES

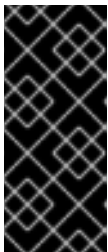
- The existing Directory Server installation runs on version 11 and has all available updates installed.

8.2. MIGRATING TO DIRECTORY SERVER 12 USING THE REPLICATION METHOD

In a replication topology, use the replication method to migrate to Directory Server 12.

Procedure

1. Install Directory Server 12.
2. On the Directory Server 12 host, enable replication, but do not create a replication agreement. For details about enabling replication, see the [Configuring and managing replication](#) documentation for *Red Hat Directory Server 12*.
3. On the Directory Server 11 host, enable replication and create a replication agreement that points to the Directory Server 12 host. For more information, see the [Multi-Supplier Replication](#) section in the *Red Hat Directory Server 11 Administrator Guide*.



IMPORTANT

If you used a custom configuration on the Directory Server 11 host, do **not** replace the **dse.ldif** configuration file on the Directory Server 12 host with the file from the Directory Server 11 host, because the **dse.ldif** layout changes between versions. Instead, use the **dsconf** utility or the web console to add the custom configuration for each parameter and plug-in that you require.

4. Optional: Set up further Directory Server 12 hosts with replication agreements between Directory Server 12 hosts.
5. Configure your clients to use only Directory Server 12 hosts.
6. On the Directory Server 11 host, remove the replication agreements that point to Directory Server 12 host. See [Removing a Directory Server Instance from the Replication Topology](#) in the *Red Hat Directory Server 11 Administration Guide*.

7. Uninstall the Directory Server 11 hosts. See [Uninstalling Directory Server](#) in the *Red Hat Directory Server 11 Installation Guide*.

8.3. MIGRATING TO DIRECTORY SERVER 12 USING THE EXPORT AND IMPORT METHOD

Use the export and import method to migrate small Directory Server environments, such as instances without replication.

Procedure

1. Perform the following steps on the existing Directory Server 11 host:

- a. Stop and disable the **dirsrv** service:

```
# dsctl instance_name stop
# systemctl disable dirsrv@instance_name
```

- b. Export the backend. For example, to export the **userRoot** backend and store it in the `/var/lib/dirsrv/slapd-instance_name/userRoot.ldif` file, run:

```
# dsctl instance_name db2ldif userroot
/var/lib/dirsrv/slapd-instance_name/userRoot.ldif
```

- c. Copy the following files to the new host where you want to install Directory Server 12:

- The `/var/lib/dirsrv/slapd-instance_name/userRoot.ldif` file that you exported in the previous step.
- The `/etc/dirsrv/slapd-instance_name/dse.ldif` configuration file.



IMPORTANT

Do **not** replace the **dse.ldif** configuration file on the Directory Server 12 host with the file from the Directory Server 11 host because the **dse.ldif** layout changes different versions. Store the **dse.ldif** file for the reference.

- `/etc/dirsrv/slapd-instance_name/schema/99user.ldif`, if you use a custom schema
 - If you want to migrate an instance with TLS enabled and reuse the same host name for the Directory Server 12 installation, copy the following files to the new host:
 - `/etc/dirsrv/slapd-instance_name/cert9.db`
 - `/etc/dirsrv/slapd-instance_name/key4.db`
 - `/etc/dirsrv/slapd-instance_name/pin.txt`
- d. If you want to use the same host name and IP on the Directory Server 12 host, disconnect the old server from the network.
2. Perform the following steps on the new host:
 - a. Install Directory Server 12.

b. Optional: Configure TLS encryption:

- If the new installation uses a different host name than the Directory Server 11 instance, see the [Enabling TLS-encrypted connections to Directory Server](#) section in the *Securing Red Hat Directory Server* documentation.
- To use the same host name as the previous Directory Server 11 installation:
 - i. Stop the instance:

```
# dsctl instance_name stop
```

- ii. Remove the Network Security Services (NSS) databases and the password file for Directory Server, if they already exist:

```
# rm /etc/dirsrv/slaped-instance_name/cert*.db
   /etc/dirsrv/slaped-instance_name/key*.db
   /etc/dirsrv/slaped-instance_name/pin.txt
```

- iii. Place the **cert9.db**, **key4.db**, and **pin.txt** files that you copied from the Directory Server 11 host to the **/etc/dirsrv/slaped-instance_name/** directory.
- iv. Set the correct permissions for the NSS databases and the password file:

```
# chown dirsrv:root /etc/dirsrv/slaped-instance_name/cert9.db
   /etc/dirsrv/slaped-instance_name/key4.db
   /etc/dirsrv/slaped-instance_name/pin.txt

# chmod 600 /etc/dirsrv/slaped-instance_name/cert9.db
   /etc/dirsrv/slaped-instance_name/key4.db
   /etc/dirsrv/slaped-instance_name/pin.txt
```

- v. Start the instance:

```
# dsctl instance_name start
```

- c. If you used a custom schema, place the **99user.ldif** file into the **/etc/dirsrv/slaped-instance_name/schema/** directory, set appropriate permissions, and restart the instance:

```
# cp /tmp/99user.ldif /etc/dirsrv/slaped-instance_name/schema/

# chmod 644 /etc/dirsrv/slaped-instance_name/schema/99user.ldif

# chown root:root /etc/dirsrv/slaped-instance_name/schema/99user.ldif

# dsctl instance_name restart
```

- d. Import the LDIF file. For example, to import the **/var/lib/dirsrv/slaped-instance_name/ldif/migration.ldif** file into the **userRoot** database:

```
# dsconf -D 'cn=Directory Manager' ldap://server.example.com backend import
   userRoot /var/lib/dirsrv/slaped-instance_name/ldif/migration.ldif
```

Note that Directory Server requires the LDIF file you want to import in the `/var/lib/dirsrv/slaped-instance_name` directory.



IMPORTANT

If you used a custom configuration on the Directory Server 11 host, do **not** replace the `dse.ldif` configuration file on the Directory Server 12 host with the file from the Directory Server 11 host. Instead, use the `dsconf` utility or the web console to add the custom configuration manually for each parameter and plug-in that you require.

CHAPTER 9. MIGRATING DIRECTORY SERVER 10 TO DIRECTORY SERVER 12

Learn about migration from Red Hat Directory Server 10 to 12, including tasks that you must perform before you start the migration.



IMPORTANT

Red Hat supports migration only from Red Hat Directory Server 10 or 11 to version 12. To migrate Directory Server from earlier version, you must perform incremental migrations to Directory Server 10 or 11.

Red Hat **does not** support an in-place upgrade of Directory Server 10 or 11 servers to version 12 by using the **leapp** upgrade tool.

9.1. PREREQUISITES

- The existing Directory Server installation runs on version 10 and has all available updates installed.

9.2. MIGRATING DIRECTORY SERVER 10 TO VERSION 12 USING THE REPLICATION METHOD

In a replication topology, use the replication method to migrate to Directory Server 12.

Procedure

1. Install Directory Server 12 on a new host.
2. On the Directory Server 12 host, enable replication, but do not create a replication agreement. For details about enabling replication, see the [Configuring and managing replication](#) in the *Red Hat Directory Server 12* documentation.
3. On the Directory Server 10 host, enable replication and create a replication agreement that points to the Directory Server 12 host. For details about enabling replication, see chapter 15 "Managing Replication" in the [Red Hat Directory Server 10 Administration Guide](#) .



IMPORTANT

If you used a custom configuration on the Directory Server 10 host, do **not** replace the **dse.ldif** configuration file on the Directory Server 12 host with the file from previous versions, because the **dse.ldif** layout changes between versions. Instead, use the **dsconf** utility or the web console to add the custom configuration for each parameter and plug-in that you require.

4. Optional: Set up further Directory Server 12 hosts with replication agreements between the Directory Server 12 hosts.
5. Configure your clients to use only the Directory Server 12 hosts.
6. On the Directory Server 10 host, remove the replication agreements that point to the Directory Server 12 host:


```
# ldapmodify -D "cn=Directory Manager" -W -x -p 389 -h server_ds_10.example.com
dn: cn=agreement-to-DS-12-server,cn=replica,cn=dc\3Dexample\2Cdc\3Dcom,cn=mapping
tree,cn=config
changetype: delete
```

7. Uninstall the Directory Server 10 hosts. See the chapter 4.8 "Uninstalling Directory Server" in the [Red Hat Directory Server 10 Installation Guide](#).

9.3. MIGRATING DIRECTORY SERVER 10 TO VERSION 12 USING THE EXPORT AND IMPORT METHOD

Use the export and import method to migrate large Directory Server environments.

Procedure

1. Perform the following steps on the existing Directory Server 10 host:
 - a. Stop and disable the **dirsrv** service:

```
# dsctl instance_name stop
# systemctl disable dirsrv@instance_name
```

- b. Export the back end. For example, to export the **userRoot** back end and store it in the **/tmp/userRoot.ldif** file:

```
# db2ldif -Z instance_name -n userRoot -a /tmp/userRoot.ldif
```

- c. Copy the following files to the new host where you want to install Directory Server 12:
 - The LDIF file **userRoot.ldif** that you exported in the previous step.
 - The **/etc/dirsrv/slapd-instance_name/schema/99user.ldif** file if you use a custom schema.
 - The **/etc/dirsrv/slapd-instance_name/dse.ldif** configuration file.



IMPORTANT

Do **not** replace the **dse.ldif** configuration file on the Directory Server 12 host with the file from the Directory Server 10 host because the **dse.ldif** layout changes between versions. Store the **dse.ldif** file for the reference.

- If you want to migrate an instance with TLS enabled and reuse the same host name for the Directory Server 12 installation, copy:
 - **/etc/dirsrv/slapd-instance_name/cert8.db**
 - **/etc/dirsrv/slapd-instance_name/key3.db**
 - **/etc/dirsrv/slapd-instance_name/pin.txt**
 - d. If you want to use the same host name and IP on the Directory Server 12 host, disconnect the old server from the network.

2. Perform the following steps on the new Directory Server 12 host:

a. Install Directory Server 12.

b. Optional: Configure TLS encryption:

- If the new installation uses a different host name than the Directory Server 10 instance, see the [Enabling TLS-encrypted connections to Directory Server](#) section in the *Securing Red Hat Directory Server* documentation.

- If you want to use the same host name as the previous Directory Server 10 installation:

i. Stop the instance:

```
# dsctl instance_name stop
```

ii. Remove the Network Security Services (NSS) databases and the password file for Directory Server, if they already exist:

```
# rm /etc/dirsrv/slapped-instance_name/cert*.db  
/etc/dirsrv/slapped-instance_name/key*.db  
/etc/dirsrv/slapped-instance_name/pin.txt
```

iii. Move the **cert8.db**, **key3.db**, and **pin.txt** files that you copied from the Directory Server 10 host to the **/etc/dirsrv/slapped-instance_name/** directory.

iv. Set the correct permissions for the NSS databases and the password file:

```
# chown dirsrv:root /etc/dirsrv/slapped-instance_name/cert8.db  
/etc/dirsrv/slapped-instance_name/key3.db  
/etc/dirsrv/slapped-instance_name/pin.txt  
  
# chmod 600 /etc/dirsrv/slapped-instance_name/cert8.db  
/etc/dirsrv/slapped-instance_name/key3.db  
/etc/dirsrv/slapped-instance_name/pin.txt
```

v. Start the instance:

```
# dsctl instance_name start
```

c. If you used a custom schema, restore the **99user.ldif** file into the **/etc/dirsrv/slapped-instance_name/schema/** directory, set appropriate permissions, and restart the instance:

```
# cp /tmp/99user.ldif /etc/dirsrv/slapped-instance_name/schema/  
  
# chmod 644 /etc/dirsrv/slapped-instance_name/schema/99user.ldif  
  
# chown root:root /etc/dirsrv/slapped-instance_name/schema/99user.ldif  
  
# dsctl instance_name restart
```

d. Place the **/tmp/userRoot.ldif** file you prepared on the Directory Server 10 host to **/var/lib/dirsrv/slapped-instance_name/ldif/** directory.

- e. Import the **userRoot.ldif** file to restore the **userRoot** back end with all entries:

```
# dsconf -D 'cn=Directory Manager' ldap://server.example.com backend import  
userRoot /var/lib/dirsrv/slapd-instance_name/ldif/userRoot.ldif
```

Note that Directory Server 12 can import LDIF files only from **/var/lib/dirsrv/slapd-*instance_name*** directory.



IMPORTANT

If you used a custom configuration on the Directory Server 10 host, do **not** replace the **dse.ldif** configuration file on the Directory Server 12 host with the file from previous versions. Instead, use the **dsconf** utility or the web console to add the custom configuration manually for each parameter and plug-in that you require.

CHAPTER 10. INSTALLING, UPDATING, AND UNINSTALLING THE PASSWORD SYNCHRONIZATION SERVICE

To synchronize passwords between Active Directory and Red Hat Directory Server, you use the password synchronization service. You can install, update, and remove the password synchronization service.

10.1. THE PASSWORD SYNCHRONIZATION SERVICE

When you set up password synchronization with Active Directory, Directory Server retrieves all attributes of user objects except the password. Active Directory stores only encrypted passwords, but Directory Server uses different encryption. As a result, Active Directory users passwords must be encrypted by Directory Server.

To enable password synchronization between Active Directory and Directory Server, the **Red Hat Directory Password Sync** service hooks up into the Windows password changing routine of a domain controller (DC). If a user or administrator sets or updates a password, the service retrieves the password in plain text before it is encrypted and stored in Active Directory. This process enables **Red Hat Directory Password Sync** to send the plain text password to Directory Server. To protect the password, the service supports only LDAPS connections to Directory Server. When Directory Server stores the password in the user's entry, the password is automatically encrypted with the password storage scheme configured in Directory Server.



IMPORTANT

In an Active Directory, all writable DCs can process password actions. Therefore, you must install **Red Hat Directory Password Sync** on every writable DC in the Active Directory domain.

10.2. DOWNLOADING THE PASSWORD SYNCHRONIZATION SERVICE INSTALLER

To install **Red Hat Directory Password Sync** service, download the installer from the Customer Portal.

Prerequisites

- You have a valid Red Hat Directory Server subscription.
- You have an account on the [Red Hat Customer Portal](#).

Procedure

1. Log into the [Red Hat Customer Portal](#).
2. Click **Downloads** at the top of the page.
3. Select **Red Hat Directory Server** from the product list.
4. Select **12** in the **Version** field.
5. Download **PassSync Installer**.
6. Copy the installer to every writable Active Directory domain controller (DC).

10.3. INSTALLING THE PASSWORD SYNCHRONIZATION SERVICE

This section describes how to install the **Red Hat Directory Password Sync** on Windows domain controllers (DC). Perform this procedure on every writable Windows DC.

Prerequisites

- You downloaded the latest version of the **PassSync Installer** to the Windows Active Directory domain controller (DC).
- You enabled TLS encryption in Directory Server.
- You prepared the Active Directory domain.
- You created an account for synchronization in Directory Server.

Procedure

1. Log in to the Active Directory DC with a user that has permissions to install software on the DC.
2. Double-click the **RedHat-PassSync-ds12.*-x86_64.msi** file to install it.
3. The **Red Hat Directory Password Sync Setup** appears. Click **Next**.
4. Fill the fields according to your Directory Server environment. For example:

Red Hat Directory Password Sync Setup

Password Synchronization Information

Please enter your password synchronization information

Host Name: server.example.com

Port Number: 636

User Name: cn=sync user,cn=config

Password: ●●●●●●●●●●●●●●●●

Cert Token:

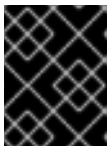
Search Base: ou=People,dc=example,dc=com

< Back **Next >** Cancel

Fill the following information of the Directory Server host into the fields:

- **Host Name:** Sets the name of the Directory Server host. Alternatively, you can set the field to the IPv4 or IPv6 address of the Directory Server host.

- **Port Number:** Sets the LDAPS port number.
 - **User Name:** Sets the distinguished name (DN) of the synchronization user account.
 - **Password:** Sets the password of the synchronization user.
 - **Cert Token:** Sets the password of the server certificate copied from the Directory Server host.
 - **Search Base:** Sets the DN of the Directory Server entry that contains the synchronized user accounts.
5. Click **Next** to start the installation.
 6. Click **Finish**.
 7. Reboot the Windows DC.



IMPORTANT

Without rebooting the DC, the **PasswordHook.dll** library is not enabled and password synchronization fails.

8. Enable replication in Directory Server and create a WinSync agreement.

Additional resources

- [Enabling TLS-encrypted connections to Directory Server](#)

10.4. UPDATING THE PASSWORD SYNCHRONIZATION SERVICE

This section describes how to update an existing **Red Hat Directory Password Sync** installation on a Windows domain controller (DC).

Perform this procedure on every writable Windows DC.

Prerequisites

- **Red Hat Directory Password Sync** is running on your Windows DC.
- You downloaded the latest version of the **PassSync Installer** to the Windows Active Directory DC.

Procedure

1. Log in to the Active Directory domain controller with a user that has permissions to install software on the DC.
2. Double-click the **RedHat-PassSync-ds12.*-x86_64.msi** file.
3. Click **Next** to begin installing.
4. Click the **Modify** button.

5. The setup displays the configuration set during the previous installation. Click **Next** to keep the existing settings.
6. Click **Next** to start the installation.
7. Click **Finish**.
8. Reboot the Windows DC.



IMPORTANT

Without rebooting the DC, the **PasswordHook.dll** library is not enabled and password synchronization will fail.

10.5. UNINSTALLING THE PASSWORD SYNCHRONIZATION SERVICE

If you no longer require the **Red Hat Directory Password Sync** service, remove it from the Active Directory domain controller (DC).

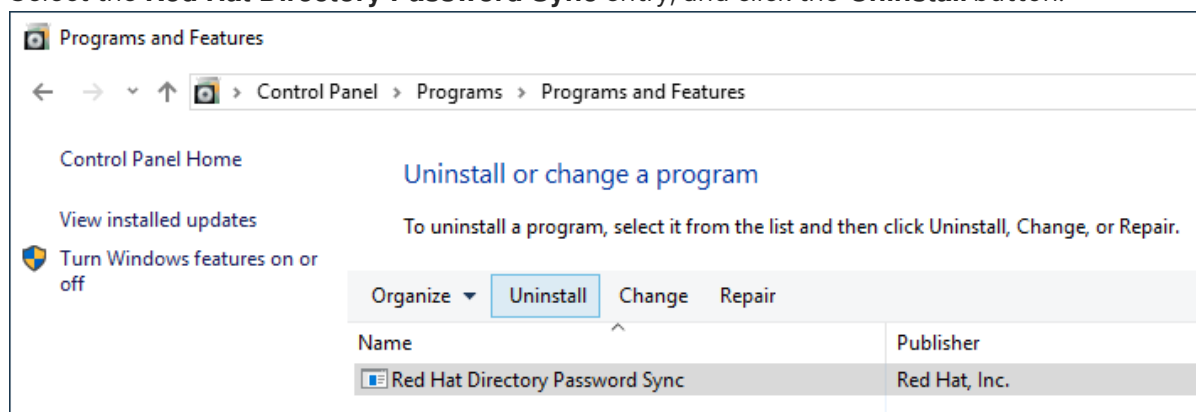
Prerequisites

- **Red Hat Directory Password Sync** is installed on the Windows DC.

Procedure

Log in to the Active Directory domain controller with a user that has permissions to remove software from the DC.

1. Open the **Control Panel**
2. Click **Programs** and then **Programs and Features**
3. Select the **Red Hat Directory Password Sync** entry, and click the **Uninstall** button.



4. Click **Yes** to confirm.

CHAPTER 11. REMOVING A DIRECTORY SERVER INSTANCE

If you no longer require a Directory Server instance, you can remove it to regain disk space. If you run multiple instances on one server, removing a specific instance does not affect the other instances.

11.1. REMOVING AN INSTANCE USING THE COMMAND LINE

You can remove a Directory Server instance using the command line.

Prerequisites

- The instance has been removed from a replication topology, if it was part of one.

Procedure

1. Optional: Create a backup of the Directory Server directories:

- a. Stop the instance:

```
# dsctl instance_name stop
```

- b. Copy the `/var/lib/dirsrv/slapd-instance_name` directory:

```
# cp -rp /var/lib/dirsrv/slapd-instance_name /root/var-lib-  
dirsrv-instance_name.bak/
```

This directory contains the database, as well as the backup and export directory.

- c. Copy the `/etc/dirsrv/slapd-instance_name` directory:

```
# cp -rp /etc/dirsrv/slapd-instance_name /root/etc-dirsrv-instance_name.bak/
```

2. Remove the instance:

```
# dsctl instance_name remove --do-it  
Removing instance ...  
Completed instance removal
```

Verification

- Verify that the `/var/lib/dirsrv/slapd-instance_name` and `/etc/dirsrv/slapd-instance_name` directories have been removed:

```
# ls /var/lib/dirsrv/slapd-instance_name /etc/dirsrv/slapd-instance_name  
ls: cannot access '/var/lib/dirsrv/slapd-instance_name': No such file or directory  
ls: cannot access '/etc/dirsrv/slapd-instance_name': No such file or directory
```

Additional resources

- [Removing an instance from a replication topology](#)

11.2. REMOVING AN INSTANCE USING THE WEB CONSOLE

You can remove a Directory Server instance using the web console. However, if you want to create a backup of the Directory Server directories which contain, for example, the databases and configuration files, you must copy these directories on the command line.

Prerequisites

- The instance has been removed from a replication topology, if it was part of one.
- You are logged in to the instance in the web console.

Procedure

1. Optional: Create a backup of the Directory Server directories.
 - a. Click the **Actions** button, and select **Stop instance**.
 - b. Copy the `/var/lib/dirsrv/slapd-instance_name/` directory:

```
# cp -rp /var/lib/dirsrv/slapd-instance_name /root/var-lib-dirsrv-instance_name.bak
```

This directory contains the database, as well as the backup and export directory.

- c. Copy the `/etc/dirsrv/slapd-instance_name/` directory:

```
# cp -rp /var/lib/dirsrv/slapd-instance_name /root/etc-dirsrv-instance_name.bak
```

2. Click the **Actions** button, and select **Remove this instance**.
3. Select **Yes, I am sure**, and click **Remove Instance** to confirm.

Verification

- Verify that the `/var/lib/dirsrv/slapd-instance_name/` and `/etc/dirsrv/slapd-instance_name/` directories have been removed:

```
# ls /var/lib/dirsrv/slapd-instance_name /etc/dirsrv/slapd-instance_name  
ls: cannot access '/var/lib/dirsrv/slapd-instance_name': No such file or directory  
ls: cannot access '/etc/dirsrv/slapd-instance_name': No such file or directory
```

Additional resources

- [Removing an instance from a replication topology](#)

CHAPTER 12. UNINSTALLING DIRECTORY SERVER

If you no longer need a Directory Server instance, you can uninstall it to reclaim space.

12.1. UNINSTALLING DIRECTORY SERVER

If you no longer require Directory Server running on a server, uninstall the packages as described in this section.

Procedure

1. Remove all instances from the replication topology. If your instance is not a member of a replication topology skip this step.
2. Remove all instances from the server. For each instance, enter:

```
# dsctl instance_name remove --do-it
```

3. Remove the Directory Server packages:

```
# dnf module remove redhat-ds
```

4. Optional: Disable the **dirsrv-12-for-rhel-8-x86_64-rpms** repository:

```
# subscription-manager repos --disable=dirsrv-12-for-rhel-8-x86_64-rpms
Repository 'dirsrv-12-for-rhel-8-x86_64-rpms' is disabled for this system.
```

5. Optional: Remove the Red Hat Directory Server subscription from the system:



IMPORTANT

If you remove a subscription that provides additional products than Directory Server, you will not be able to install or update packages for these products.

- List the subscriptions attached to the host:

```
# subscription-manager list --consumed
Subscription Name: Example Subscription
...
Pool-ID:          5ab6a8df96b03fd30aba9a9c58da57a1
...
```

- Remove the subscription using the pool id from the previous step:

```
# subscription-manager remove --pool=5ab6a8df96b03fd30aba9a9c58da57a1
2 local certificates have been deleted.
The entitlement server successfully removed these pools:
5ab6a8df96b03fd30aba9a9c58da57a1
The entitlement server successfully removed these serial numbers:
1658239469356282126
```

Additional resources

- [Removing an instance from a replication topology](#)

CHAPTER 13. LOGGING IN TO THE DIRECTORY SERVER BY USING THE WEB CONSOLE

The web console is a browser-based graphical user interface (GUI) that you can use for performing administrative tasks. The Directory Server package automatically installs the Directory Server user interface for the web console.

Prerequisites

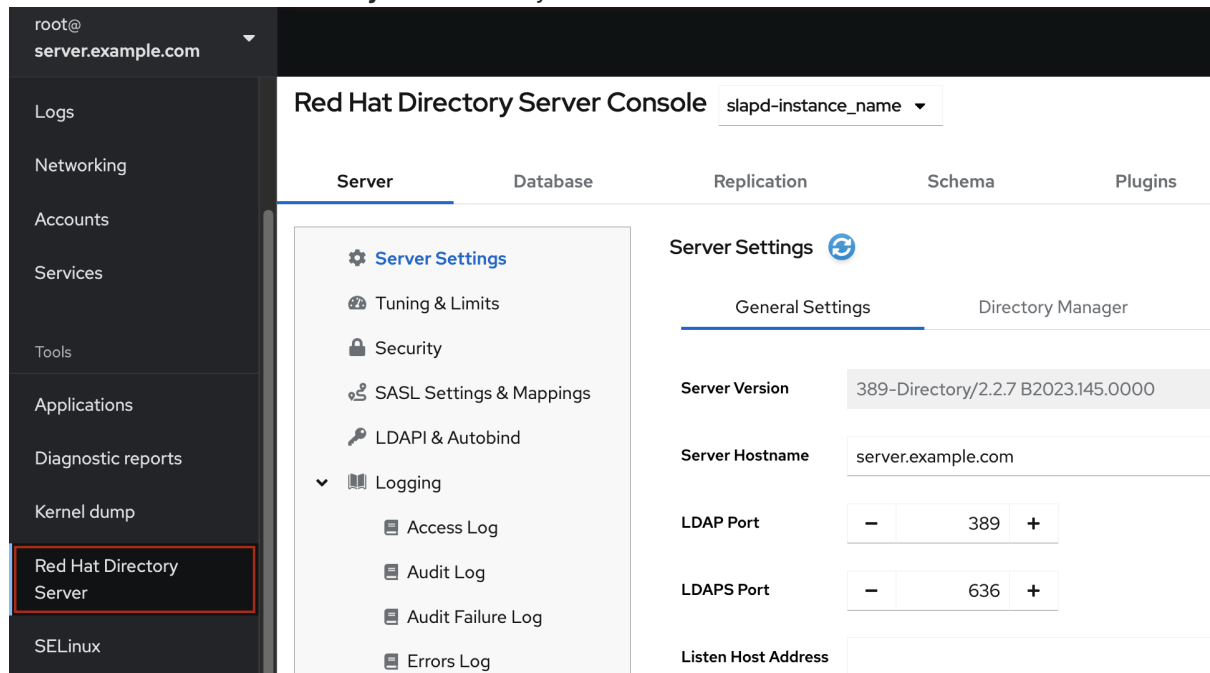
- You have permissions to access the web console.

Procedure

- Access the web console by using the following URL in your browser:

```
https://<directory_server_host>:9090
```

- Log in as a user with **sudo** privileges.
- Select the **Red Hat Directory Server** entry.



Additional resources

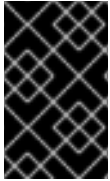
- [Logging in to the RHEL web console](#) .

CHAPTER 14. STARTING AND STOPPING A DIRECTORY SERVER INSTANCE

You can start, stop, and restart a Directory Server instance by using the command line or the web console.

14.1. STARTING AND STOPPING A DIRECTORY SERVER INSTANCE BY USING THE COMMAND LINE

Use the **dsctl** utility to start, stop, or restart a Directory Server instance.



IMPORTANT

The **dsctl** utility is the only correct way to stop the Directory Server instances. Do not use the **kill** command to terminate the **ns-slapd** process to avoid any data loss and corruption.

Procedure

- To start the instance, run:

```
# dsctl instance_name start
```

- To stop the instance, run:

```
# dsctl instance_name stop
```

- To restart the instance, run:

```
# dsctl instance_name restart
```

Optionally, you can enable Directory Server instances to automatically start when the system boots:

- For a single instance, run:

```
# systemctl enable dirsrv@instance_name
```

- For all instances on a server, run:

```
# systemctl enable dirsrv.target
```

Verification

You can check the instance status by using the **dsctl** or **systemctl** utility:

- To view the instance status by using the **dsctl** utility, run:

```
# dsctl instance_name status
```

- To view the instance status by using the **systemctl** utility, run:

```
# systemctl status dirsrv@instance_name
```

Additional resources

- [Managing system services with systemctl](#)

14.2. STARTING AND STOPPING A DIRECTORY SERVER INSTANCE BY USING THE WEB CONSOLE

You can use the web console to start, stop, or restart a Directory Server instance.

Prerequisites

- You are logged in to the web console. For more details, see
- [Logging in to the Directory Server by using the web console](#)

Procedure

1. Select the Directory Server instance.
2. Click the **Actions** button and select the action to execute:
 - **Start Instance**
 - **Stop Instance**
 - **Restart Instance**



Actions ▼

Start Instance

Stop Instance

Restart Instance

Verification

- Ensure that the Directory Server instance is running. When the instance is not running, the web console displays the following message:

This server instance is not running, either start it from the **Actions** dropdown menu, or choose a different instance.

CHAPTER 15. CHANGING THE LDAP AND LDAPS PORT NUMBERS

By default, Directory Server uses port **389** for the LDAP and, if you enabled, port **636** for the LDAPS protocol. You can change the port numbers, for example, to run multiple Directory Server instances on one host.



IMPORTANT

Other services must not use new ports that you assigned to the protocols for an instance.

15.1. CHANGING THE PORT NUMBERS USING THE COMMAND LINE

You can change the port numbers of the LDAP and LDAPS protocol using the command line. LDAP and LDAPS port change requires update of the **nsslapd-port** and **nsslapd-securePort** parameters.

Procedure

1. Optionally: Display the current port numbers for the instance:

```
# dsconf -D "cn=Directory Manager" ldap://server.example.com config get nsslapd-port nsslapd-securePort
```

2. Change the LDAP port:

- a. Set the new port for the LDAP protocol. For example, to set it to **1389**, run:

```
# dsconf -D "cn=Directory Manager" ldap://server.example.com config replace nsslapd-port=1389
```

- b. Set the **ldap_port_t** type for the LDAP port you assigned in the previous step:

```
# semanage port -a -t ldap_port_t -p tcp 1389
```

3. Change the LDAPS port:

- a. Set the new port for the LDAPS protocol. For example, to set it to **1636**, run:

```
# dsconf -D "cn=Directory Manager" ldap://server.example.com config replace nsslapd-securePort=1636
```

- b. Set the **ldap_port_t** type for the LDAPS port you assigned in the previous step:

```
# semanage port -a -t ldap_port_t -p tcp 1636
```

4. Restart the instance:

```
# dsctl instance_name restart
```

Verification

1. Verify that Directory Server now uses the new LDAP port by the command:


```
# dsconf instance_name config get nsslapd-port
```

2. Verify that Directory Server now uses the new LDAPS port number by the command:

```
# dsconf instance_name config get nsslapd-securePort
```

Additional resources

- For more details on **nsslapd-securePort** parameter, see [Description of the nsslapd-securePort parameter](#)
- For more details on **nsslapd-port** parameter, see [Description of the nsslapd-port parameter](#)

15.2. CHANGING THE PORT NUMBERS USING THE WEB CONSOLE

You can change the port numbers of the LDAP and LDAPS protocol using the web console.

Prerequisites

- You are logged in to the instance in the web console.

Procedure

1. Change the LDAP port:
 - a. Open the **Server Setting** menu.
 - b. On the **Server Setting** tab, enter the new port number into the **LDAP Port** field.
2. Click **Save**.
3. Change the LDAPS port:
 - a. Open the **Server Setting** menu.
 - b. On the **General Settings** tab, enter the new port number into the **LDAPS Port** field.
 - c. Click **Save**.
4. Restart the instance by clicking **Action** and selecting **Restart Instance**.

Verification

1. Verify in the server setting that the changed port is reflected .

Additional resources

- For more details on restarting the instance, see [Starting and Stopping a Directory Server instance using the web console](#)
- For more information on logging into Directory Server using web console, see [Logging into Directory Server using web console](#)

CHAPTER 16. MANAGING DEFAULT OPTIONS FOR DIRECTORY SERVER COMMAND-LINE UTILITIES USING .DSRC FILE

A `~/.dsrc` file simplifies commands that use the Directory Server command-line utilities. By default, you can pass information, for example, the **LDAP URL** or the bind distinguished name (DN) to the command for these utilities. You can store the settings in a `~/.dsrc` file to use the command-line utilities without specifying these settings each time.

16.1. HOW A .DSRC FILE SIMPLIFIES COMMANDS

You can specify the LDAP URL of an instance and a bind DN in a `~/.dsrc` file:

```
# server1
uri = ldap://server1.example.com
binddn = cn=Directory Manager
basedn = dc=example,dc=com
```

You can use shorter Directory Server commands with these settings. For example, to create a user account:

```
# dsidm server1 user create
```

Without the `~/.dsrc` file, you must specify the bind DN, LDAP URL, and base DN in the command:

```
# dsidm -D cn=Directory Manager ldap://server1.example.com -b "dc=example,dc=com" user create
```

16.2. USING THE DSCTL UTILITY TO CREATE A .DSRC FILE

You can use the `dsctl` utility to create a `~/.dsrc` file instead of creating it manually.

Procedure

- Run:

```
# dsctl instance_name dsrc create ...
```

You can add these options in the command:

- **--uri**

When using the `--uri` option, sets the URL to the instance in the format **protocol://host_name_or_IP_address_or_socket**

For example:

- a. `--uri ldap://server.example.com`
- b. `--uri = ldaps://server.example.com`
- c. `--uri = ldapi://%%2fvar%%2frun%%2fslapd-instance_name.socket`

When you set the path to the Directory Server socket, use **%%02** instead of slashes (/) in the path.



IMPORTANT

The server identifies the user ID (UID) and group ID (GID) of the user who runs the Directory Server command-line utility when you use the **ldapi** URL. If you run the command as the **root** user, both UID and GID are **0** and Directory Server automatically authenticates you as **cn=Directory Manager** without entering the corresponding password.

- **--starttls**

When using the **--starttls** option, configures the utilities to connect to an LDAP port and then send the **STARTTLS** command to switch to an encrypted connection.

- **--basedn**

When using the **--basedn** option, sets the base distinguished name (DN).

For example: **--basedn dc=example,dc=com**

- **--binddn**

When using the **--basedn** option, sets the bind DN.

For example: **--binddn cn=Directory Manager**

- **--pwdfile**

When using the **--pwdfile**, sets the path to a file that contains the password of bind DN.

For example: **--pwdfile /root/rhds.pwd**

- **--tls-cacertdir**

When using the **--tls-cacertdir** option, sets the path in this parameter which defines the directory with the certificate authority (CA) certificate that is required to verify the server's certificate if you use the LDAPS connection.

For example: **--tls-cacertdir /etc/pki/CA/certs/**



NOTE

You can use the **c_rehash /etc/pki/CA/certs/** command only when you copy the CA certificate to the specified directory.

- **--tls-cert**

When using the **--tls-cert** option, sets the absolute path to the server's certificate.

For example: **--tls-cert /etc/dirsrv/slapd-instance_name/Server-Cert.crt**

- **--tls-key**

When using the **--tls-key** option, sets the absolute path to the server's private key.

For example: **--tls-key /etc/dirsrv/slapped-instance_name/Server-Cert.key**

- **--tls-reqcert**

When using the **--tls-reqcert** option, sets what checks the client utilities perform on server certificates in a TLS session.

For example: **--tls-reqcert hard**

These parameters are available:

- a. **never**: The utilities do not request or check the server certificate.
- b. **allow**: The utilities ignore certificate errors and the connection is established anyway.
- c. **hard**: The utilities terminate the connection on certificate errors.

- **--saslmech**

When using the **--saslmech** option, sets the SASL mechanism to use to **PLAIN** or **EXTERNAL**.

For example: **--saslmech PLAIN**

16.3. REMOTE AND LOCAL CONNECTION RESOLUTION WHEN USING DIRECTORY SERVER UTILITIES

You can call Directory Server commands remotely and locally when securing the Directory Server connection. When you run a Directory Server command with an LDAP URL specified, the server considers it as a remote connection and checks the **/etc/openldap/ldap.conf** configuration file along with system-wide settings to proceed with the command.

When you run a Directory Server command with an instance name specified, the server checks if the **~/dsrc** file is present and applies the following logic to proceed:

1. The Directory Server considers the **~/dsrc** file as a remote connection and checks whether the **/etc/openldap/ldap.conf** configuration file and system-wide settings contain both the instance name and the LDAP URL.
2. The Directory Server considers the **~/dsrc** file as a local connection and uses the **nsslapd-certdir** setting from the local **dse.ldif** file to secure the connection if the **~/dsrc** file contains only the specified instance name, or if the **~/dsrc** file does not exist. The server uses the default path **/etc/dirsrv/slapped-instance_name/** to store the Network Security Services (NSS) database of the instance if **nsslapd-certdir** is not present.

Additional resources

- [nsslapd-certdir parameter](#)

CHAPTER 17. CREATING TEST ENTRIES

The **dsctl ldifgen** command creates LDIF files with different types of test entries. For example, you can use this LDIF file to populate a test instance or a sub-tree to test the performance of Directory Server with the example entries.

17.1. OVERVIEW OF TESTING ENTRIES YOU CAN CREATE

You can pass one of the following entry type arguments to **dsctl ldifgen**:

- **users**: Creates an LDIF file that contains user entries.
- **groups**: Creates an LDIF file that contains static group and member entries.
- **cos-def**: Creates an LDIF file that either contains a classic pointer or an indirect Class of Service (CoS) definition.
- **cos-template**: Creates an LDIF file that contains a CoS template.
- **roles**: Creates an LDIF file that contains managed, filtered, or indirect role entries.
- **mod-load**: Creates an LDIF file that contains modify operations. Use the **ldapmodify** utility to load the file into the directory.
- **nested**: Creates an LDIF file that contains heavily nested entries in a cascading or fractal tree design.



NOTE

The **dsctl ldifgen** command creates only the LDIF file. To load the file into your Directory Server instance, use the:

- **ldapmodify** utility after you created an LDIF file using the **mod-load** option
- **ldapadd** utility for all other options

Except for the nested entry type, if you do not provide any command line options, the **dsctl ldifgen** command uses an interactive mode:

```
# dsctl instance_name ldifgen entry_type
```

17.2. CREATING AN LDIF FILE WITH EXAMPLE USER ENTRIES

Use the **dsctl ldifgen users** command to create an LDIF file with example user entries.

Procedure

1. For example, to create an LDIF file named **/tmp/users.ldif** that adds 100,000 generic users to the **dc=example,dc=com** suffix, enter:

```
# dsctl instance_name ldifgen users --suffix "dc=example,dc=com" --number 100000 --generic --ldif-file=/tmp/users.ldif
```

Note that the command creates the following organizational units (OU) and randomly assigns the users to these OUs:

- **ou=accounting**
- **ou=product development**
- **ou=product testing**
- **ou=human resources**
- **ou=payroll**
- **ou=people**
- **ou=groups**

For further details and other options you can use to create the LDIF file, enter:

```
# dsctl instance_name ldifgen users --help
```

2. Optional: Add the test entries to the directory:

```
# ldapadd -D "cn=Directory Manager" -W -H ldap://server.example.com -x -c -f /tmp/users.ldif
```

17.3. CREATING AN LDIF FILE WITH EXAMPLE GROUP ENTRIES

Use the **dsctl ldifgen groups** command to create an LDIF file with example user entries.

Procedure

1. For example, to create an LDIF file named **/tmp/groups.ldif** that adds 500 groups to the **ou=groups,dc=example,dc=com** entry, and each group has 100 members, enter:

```
# dsctl instance_name ldifgen groups --number 500 --suffix "dc=example,dc=com" --parent "ou=groups,dc=example,dc=com" --num-members 100 --create-members --member-parent "ou=People,dc=example,dc=com" --ldif-file /tmp/groups.ldif example_group__
```

Note that the command also creates LDIF statements to add the user entries in **ou=People,dc=example,dc=com**.

For further details and other options you can use to create the LDIF file, enter:

```
# dsctl instance_name ldifgen groups --help
```

2. Optional: Add the test entries to the directory:

```
# ldapadd -D "cn=Directory Manager" -W -H ldap://server.example.com -x -c -f /tmp/groups.ldif
```

17.4. CREATING AN LDIF FILE WITH AN EXAMPLE COS DEFINITION

Use the **dsctl ldifgen cos-def** command to create an LDIF file with a Class of Service (CoS) definition.

Procedure

1. For example, to create an LDIF file named **/tmp/cos-definition.ldif** that adds a classic CoS definition to the **ou=cos-definitions,dc=example,dc=com** entry, enter:

```
# dsctl instance_name ldifgen cos-def Postal_Def --type classic --parent "ou=cos
definitions,dc=example,dc=com" --cos-specifier businessCatagory --cos-template
"cn=sales,cn=classicCoS,dc=example,dc=com" --cos-attr postalcode
telephonenumber --ldif-file /tmp/cos-definition.ldif
```

For further details and other options you can use to create the LDIF file, enter:

```
# dsctl instance_name ldifgen cos-def --help
```

2. Optional: Add the test entries to the directory:

```
# ldapadd -D "cn=Directory Manager" -W -H ldap://server.example.com -x -c -f
/tmp/cos-definition.ldif
```

17.5. CREATING AN LDIF FILE WITH EXAMPLE MODIFICATION STATEMENTS

Use the **dsctl ldifgen mod-load** command to create an LDIF file that contains update operations.

Procedure

1. For example, to create an LDIF file named **/tmp/modifications.ldif**:

```
# dsctl instance_name ldifgen mod-load --num-users 1000 --create-users --
parent="ou=People,dc=example,dc=com" --mod-attrs="sn" --add-users 10 --modrdn-
users 100 --del-users 100 --delete-users --ldif-file=/tmp/modifications.ldif
```

This command creates a file named **/tmp/modifications.ldif** file with the statements that do the following:

- Create an LDIF file with 1000 **ADD** operations to create user entries in **ou=People,dc=example,dc=com**.
- Modify all entries by changing their **sn** attributes.
- Add additional 10 user entries.
- Perform 100 **MODRDN** operations.
- Delete 100 entries
- Delete all remaining entries at the end

For further details and other options you can use to create the LDIF file, enter:

```
# dsctl instance_name ldifgen mod-load --help
```

2. Optional: Add the test entries to the directory:

```
# ldapadd -D "cn=Directory Manager" -W -H ldap://server.example.com -x -c -f /tmp/modifications.ldif
```

17.6. CREATING AN LDIF FILE WITH NESTED EXAMPLE ENTRIES

Use the **dsctl ldifgen nested** command to create an LDIF file that contains a heavily nested cascading fractal structure.

Procedure

1. For example, to create an LDIF file named **/tmp/nested.ldif** that adds 600 users in total in different organizational units (OU) under the **dc=example,dc=com** entry, with each OU containing a maximum number of 100 users, enter:

```
# dsctl instance_name ldifgen nested --num-users 600 --node-limit 100 --suffix "dc=example,dc=com" --ldif-file /tmp/nested.ldif
```

For further details and other options you can use to create the LDIF file, enter:

```
# dsctl instance_name ldifgen nested --help
```

2. Optional: Add the test entries to the directory:

```
# ldapadd -D "cn=Directory Manager" -W -H ldap://server.example.com -x -c -f /tmp/nested.ldif
```