



# Red Hat Ceph Storage 4

## Object Gateway with LDAP and AD Guide

Configuring Ceph Object Gateway to use LDAP and AD to authenticate object gateway users.



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## Abstract

This document describes how to configure Directory Server or Active Directory and the Ceph Object Gateway to use LDAP to authenticate Ceph Object Gateway users. Red Hat is committed to replacing problematic language in our code, documentation, and web properties. We are beginning with these four terms: master, slave, blacklist, and whitelist. Because of the enormity of this endeavor, these changes will be implemented gradually over several upcoming releases. For more details, see our CTO Chris Wright's message .

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## CHAPTER 1. PREFACE

Red Hat Ceph Storage supports Light-weight Directory Access Protocol (LDAP) servers for authenticating Ceph Object Gateway users. Configuring a cluster for use with LDAP requires the following:

1. A Ceph Object Gateway server and Ceph Storage cluster.
2. An LDAP server.
3. An SSL certificate for LDAPS.
4. An LDAP user for authenticating the Ceph Object Gateway.
5. At least one LDAP user for authenticating S3 clients.

## CHAPTER 2. CONFIGURE LDAP AND CEPH OBJECT GATEWAY

Perform the following steps to configure Red Hat Directory Server to authenticate Ceph Object Gateway users.

### 2.1. INSTALL RED HAT DIRECTORY SERVER

Retrieve the LDAP host's fully qualified domain name (FQDN) using **hostname** on the command line. Then, ensure that the host FQDN is resolvable via DNS or in **/etc/hosts** and **resolv.conf** before installing.

Red Hat Directory Server should be installed on a Red Hat Enterprise Linux 7 server with a graphical user interface (GUI) in order to use the Java Swing GUI Directory and Administration consoles. However, Red Hat Directory Server can still be serviced exclusively from the command line. To install Red Hat Directory Server, see the [\\_Installation Guide\\_](#) for Red Hat Directory Server 10.

### 2.2. CONFIGURE THE DIRECTORY SERVER FIREWALL

On the LDAP host, make sure that the firewall allows access to the Directory Server's secure (**636**) port, so that LDAP clients can access the Directory Server. Leave the default unsecure port (**389**) closed.

```
# firewall-cmd --zone=public --add-port=636/tcp
# firewall-cmd --zone=public --add-port=636/tcp --permanent
```

### 2.3. LABEL PORTS FOR SELINUX

To ensure SELinux does not block requests, label the ports for SELinux. For details see the [Changing Directory Server Port Numbers](#) section in the *Administration Guide* for Red Hat Directory Server 10.

### 2.4. CONFIGURE LDAPS

The Ceph Object Gateway uses a simple ID and password to authenticate with the LDAP server, so the connection requires an SSL certificate for LDAP. To configure Directory Server for LDAP, see the [Configuring Secure Connections](#) chapter in the *Administration Guide* for Red Hat Directory Server 10.

Once the LDAP is working, configure the Ceph Object Gateway servers to trust the Directory Server's certificate.

1. Extract/Download a PEM-formatted certificate for the Certificate Authority (CA) that signed the LDAP server's SSL certificate.
2. Confirm that **/etc/openldap/ldap.conf** does not have **TLS\_REQCERT** set.
3. Confirm that **/etc/openldap/ldap.conf** contains a **TLS\_CACERTDIR /etc/openldap/certs** setting.
4. Use the **certutil** command to add the AD CA to the store at **/etc/openldap/certs**. For example, if the CA is "msad-frog-MSAD-FROG-CA", and the PEM-formatted CA file is **ldap.pem**, use the following command:

```
# certutil -d /etc/openldap/certs -A -t "TC,," -n "msad-frog-MSAD-FROG-CA" -i
/path/to/ldap.pem
```



- 5. Update SELinux on all remote LDAP sites:

```
# setsebool -P httpd_can_network_connect on
```



#### NOTE

This still has to be set even if SELinux is in permissive mode.

- 6. Make the **certs** database world-readable.

```
# chmod 644 /etc/openldap/certs/*
```

Connect to the server using "ldapwhoami" as a non-root user. For example:

```
$ ldapwhoami -H ldaps://rh-directory-server.example.com -d 9
```

The **-d 9** option will provide debugging information in case something went wrong with the SSL negotiation.

## 2.5. CHECK IF THE GATEWAY USER EXISTS

Before creating the gateway user, ensure that the Ceph Object Gateway doesn't already have the user. For example:

```
# radosgw-admin metadata list user
```

The user name should NOT be in this list of users.

## 2.6. ADD A GATEWAY USER

Create an LDAP user for the Ceph Object Gateway, and make a note of the **binddn**. Since the Ceph object gateway uses the **ceph** user, consider using **ceph** as the username. The user needs to have permissions to search the directory.

Test to ensure that the user creation worked. Where **ceph** is the user ID under **People** and **example.com** is the domain, you can perform a search for the user.

The Ceph Object Gateway will bind to this user as specified in the **rgw\_ldap\_binddn**.

Test to ensure that the user creation worked. Where **ceph** is the user ID under **People** and **example.com** is the domain, you can perform a search for the user.

```
# ldapsearch -x -D "uid=ceph,ou=People,dc=example,dc=com" -W -H ldaps://example.com -b "ou=People,dc=example,dc=com" -s sub 'uid=ceph'
```

On each gateway node, create a file for the user's secret. For example, the secret may get stored in a file entitled **/etc/bindpass**. For security, change the owner of this file to the **ceph** user and group to ensure it is not globally readable.

On the administrative node for the Ceph cluster, add the **rgw\_ldap\_secret** setting in the **[global]** section of the Ceph configuration file. For example:

```
[global]
...
rgw_ldap_secret = /etc/bindpass
```

Finally, copy the updated configuration file to each Ceph node.

```
# scp /etc/ceph/ceph.conf <node>:/etc/ceph
```

## 2.7. CONFIGURE THE GATEWAY TO USE LDAP

On the administrative node for the Ceph cluster, add the following settings in the **[global]** section of the Ceph configuration file. For example:

```
[global]
rgw_ldap_uri = ldaps://<fqdn>:636
rgw_ldap_binddn = "<binddn>"
rgw_ldap_secret = "/etc/bindpass"
rgw_ldap_searchdn = "<seachdn>"
rgw_ldap_dnattr = "uid"
rgw_s3_auth_use_ldap = true
```

For the **rgw\_ldap\_uri** setting, substitute **<fqdn>** with the fully qualified domain name of the LDAP server. If there is more than one LDAP server, specify each domain.

For the **rgw\_ldap\_binddn** setting, substitute **<binddn>** with the bind domain. With a domain of **example.com** and a **ceph** user under **users** and **accounts**, it should look something like this:

```
rgw_ldap_binddn = "uid=ceph,cn=users,cn=accounts,dc=example,dc=com"
```

For the **rgw\_ldap\_searchdn** setting, substitute **<searchdn>** with the search domain. With a domain of **example.com** and users under **users** and **accounts**, it should look something like this:

```
rgw_ldap_searchdn = "cn=users,cn=accounts,dc=example,dc=com"
```

Copy the updated configuration file to each Ceph node.

```
scp /etc/ceph/ceph.conf <hostname>:/etc/ceph
```

Finally, restart the Ceph Object Gateway. It should be one of:

```
# systemctl restart ceph-radosgw
# systemctl restart ceph-radosgw@rgw.`hostname` -s`
```

## 2.8. USING A CUSTOM SEARCH FILTER

You can create a custom search filter to limit user access by using the **rgw\_ldap\_searchfilter** setting. Specify this setting under the **[global]** section of the Ceph configuration file ( **/etc/ceph/ceph.conf**). There are two ways to use the **rgw\_ldap\_searchfilter** setting:

1. Specifying a Partial Filter

### Example

```
"objectclass=inetorgperson"
```

The Ceph Object Gateway will generate the search filter with the user name from the token and the value of **rgw\_ldap\_dnattr**. The constructed filter is then combined with the partial filter from the **rgw\_ldap\_searchfilter** value. For example, the user name and the settings generate the final search filter:

### Example

```
"(&(uid=joe)(objectclass=inetorgperson))"
```

User **joe** will only be granted access if he is found in the LDAP directory, he has an object class of **inetorgperson**, and he specifies a valid password.

## 2. Specifying a Complete Filter

A complete filter must contain a **USERNAME** token which will be substituted with the user name during the authentication attempt. The **rgw\_ldap\_dnattr** setting is not used in this case. For example, to limit valid users to a specific group, use the following filter:

### Example

```
"(&(uid=@USERNAME@)(memberOf=cn=ceph-users,ou=groups,dc=mycompany,dc=com))"
```

## CHAPTER 3. CONFIGURE AD AND CEPH OBJECT GATEWAY

Perform the following steps to configure an Active Directory server to authenticate Ceph Object Gateway users.

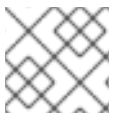
### 3.1. USING MICROSOFT ACTIVE DIRECTORY

Ceph Object Gateway LDAP authentication is compatible with any LDAP-compliant directory service that can be configured for simple bind, including Microsoft Active Directory. Using Active Directory is similar to using RH Directory server in that the Ceph object gateway binds as the user configured in the `rgw_ldap_binddn` setting, and using LDAPs to ensure security.

The process for configuring Active Directory is essentially identical with [Configuring LDAP and Ceph Object Gateway](#), but may have some Windows-specific usage.

### 3.2. CONFIGURING ACTIVE DIRECTORY FOR LDAPS

Active Directory LDAP servers are configured to use LDAPs by default. Windows Server 2012 and higher can use Active Directory Certificate Services. Instructions for generating and installing SSL certificates for use with Active Directory LDAP are available in the following MS TechNet article: [LDAP over SSL \(LDAPS\) Certificate](#).



#### NOTE

Ensure that port **636** is open on the Active Directory host.

### 3.3. CHECK IF THE GATEWAY USER EXISTS

Before creating the gateway user, ensure that the Ceph Object Gateway doesn't already have the user. For example:

```
# radosgw-admin metadata list user
```

The user name should NOT be in this list of users.

### 3.4. ADD A GATEWAY USER

Create an LDAP user for the Ceph Object Gateway, and make a note of the `binddn`. Since the Ceph object gateway uses the `ceph` user, consider using `ceph` as the username. The user needs to have permissions to search the directory.

Test to ensure that the user creation worked. Where `ceph` is the user ID under `People` and `example.com` is the domain, you can perform a search for the user.

The Ceph Object Gateway will bind to this user as specified in the `rgw_ldap_binddn`.

Test to ensure that the user creation worked. Where `ceph` is the user ID under `People` and `example.com` is the domain, you can perform a search for the user.

```
# ldapsearch -x -D "uid=ceph,ou=People,dc=example,dc=com" -W -H ldaps://example.com -b
"ou=People,dc=example,dc=com" -s sub 'uid=ceph'
```

On each gateway node, create a file for the user's secret. For example, the secret may get stored in a file entitled `/etc/bindpass`. For security, change the owner of this file to the `ceph` user and group to ensure it is not globally readable.

On the administrative node for the Ceph cluster, add the `rgw_ldap_secret` setting in the `[global]` section of the Ceph configuration file. For example:

```
[global]
...
rgw_ldap_secret = /etc/bindpass
```

Finally, copy the updated configuration file to each Ceph node.

```
# scp /etc/ceph/ceph.conf <node>:/etc/ceph
```

### 3.5. CONFIGURING THE GATEWAY TO USE ACTIVE DIRECTORY

On the administrative node for the Ceph cluster, add the following settings in the `[global]` section of the Ceph configuration file after the `rgw_ldap_secret` setting. For example:

```
[global]
rgw_ldap_secret = "/etc/bindpass"
...
rgw_ldap_uri = ldaps://<fqdn>:636
rgw_ldap_binddn = "<binddn>"
rgw_ldap_searchdn = "<seachdn>"
rgw_ldap_dnattr = "cn"
rgw_s3_auth_use_ldap = true
```

For the `rgw_ldap_uri` setting, substitute `<fqdn>` with the fully qualified domain name of the LDAP server. If there is more than one LDAP server, specify each domain.

For the `rgw_ldap_binddn` setting, substitute `<binddn>` with the bind domain. With a domain of `example.com` and a `ceph` user under `users` and `accounts`, it should look something like this:

```
rgw_ldap_binddn = "uid=ceph,cn=users,cn=accounts,dc=example,dc=com"
```

For the `rgw_ldap_searchdn` setting, substitute `<searchdn>` with the search domain. With a domain of `example.com` and users under `users` and `accounts`, it should look something like this:

```
rgw_ldap_searchdn = "cn=users,cn=accounts,dc=example,dc=com"
```

Copy the updated configuration file to each Ceph node.

```
scp /etc/ceph/ceph.conf <hostname>:/etc/ceph
```

Finally, restart the Ceph Object Gateway. It should be one of:

```
# systemctl restart ceph-radosgw
# systemctl restart ceph-radosgw@rgw.`hostname` -s`
```

## CHAPTER 4. TEST THE CONFIGURATION

Once you have configured Ceph Object Gateway to use LDAP to authenticate users, test the configuration.

### 4.1. ADD AN S3 USER TO THE LDAP SERVER

In the administrative console on LDAP server, create at least one S3 user so that an S3 client can use the LDAP user credentials. Make a note of the user name and secret for use when passing the credentials to the S3 client.

### 4.2. EXPORT AN LDAP TOKEN

When running Ceph Object Gateway with LDAP, the access token is all that is required. However, the access token is created from the access key and secret. Export the access key and secret key as an LDAP token.

1. Export the access key.

```
# export RGW_ACCESS_KEY_ID="<username>"
```

2. Export the secret.

```
# export RGW_SECRET_ACCESS_KEY="<password>"
```

3. Export the token. For LDAP, use **ldap** as the token type (**ttype**).

```
# radosgw-token --encode --ttype=ldap
```

For Active Directory, use **ad** as the token type.

```
# radosgw-token --encode --ttype=ad
```

The result is a base-64 encoded string, which is the access token. Provide this access token to S3 clients in lieu of the access key. The secret is no longer required.

4. (Optional) For added convenience, export the base-64 encoded string to the **RGW\_ACCESS\_KEY\_ID** environment variable if the S3 client uses the environment variable.

```
# export
RGW_ACCESS_KEY_ID="ewogICAgIjJHV19UT0tFTiI6IHsKICAgICAgICAidmVyc2lvbiI6IDEsCi
AgICAgICAgInR5cGUiOiAibGRhcClScIiAgICAgICAgImkljogImNlcGgiLAogICAgICAgICJrZXkiO
iAiODAwI0dvcmlsbGEiCiAgICB9Cn0K"
```

### 4.3. TEST THE CONFIGURATION WITH AN S3 CLIENT

Pick a Ceph Object Gateway client such as Python Boto. Configure it to use the **RGW\_ACCESS\_KEY\_ID** environment variable. Alternatively, you may copy the base-64 encoded string and specify it as the access key. Then, run the Ceph client.

**NOTE**

The secret is no longer required.