

LDAP authentication and authorisation, part 1: OpenLDAP setup

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It is a common practice to use LDAP / Active Directory within organisations to authenticate and authorise employees. This is probably the reason why it is the most commonly used Search Guard feature. In this post we provide an overview of LDAP with a live demo. This will help you to understand how LDAP works and test the integration of LDAP with Search Guard powered Elasticsearch cluster.

LDAP Overview

Active Directory is a directory service developed by Microsoft while LDAP (The Lightweight Directory Access Protocol) is an open industry standard directory service.

Directory services allow to store objects in a directory tree. Each object is identified by its distinguished name (DN) and contains attributes. A distinguished name is a chosen subset of object attributes. LDAP comes with predefined object classes that may be helpful for managing organisation's assets.

It is a common practice to store users and their passwords within LDAP. In that case the password is an attribute of a user entry. Together with the ability to manage a users' groups, this allows to use LDAP for authentication and authorisation. Both of them are supported with Search Guard.

OpenLDAP demo setup

We will run OpenLDAP within a Docker container. There are many ready-made [Docker images containing OpenLDAP](#) out there with you can use as quickstart.

The LDAP server will be accessed via `ldap.example.com` in the remainder of this article, so we add an entry to local `/etc/hosts`:

```
127.0.0.1 ldap.example.com
```

We can then run the LDAP server based [on the docker image](#) available on Github with:

```
docker run -p 389:389 \
  --env LDAP_ORGANISATION="My Company" \
  --env LDAP_DOMAIN="example.com" \
  --env LDAP_ADMIN_PASSWORD="pass" \
  --detach osixia/openldap:1.2.2
```

We also install [ApacheDirectoryStudio](#) on our local machine to manage LDAP users. The LDAP connection can be configured with the following network and authentication parameters:

Network Parameter

Authentication

Browser Options

Edit Options

Connection name: ldap.example.com

Network Parameter

Hostname: ldap.example.com

Port: 389

Connection timeout (s): 30

Encryption method: No encryption

Server certificates for LDAP connections can be managed in the ['Certificate Validation'](#) preference page.

Provider: Apache Directory LDAP Client API

Check Network Parameter

Network Parameter

Authentication

Browser Options

Edit Options

Authentication Method

Simple Authentication

Authentication Parameter

Bind DN or user: cn=admin,dc=example,dc=com

Authorization ID (SASL): SASL PLAIN only

Bind password: ●●●●

☒ Save password

Check Authentication

► SASL Settings

► Kerberos Settings

Creating sample users

Next we create a sample user `hremmployee_` in ApacheDirectoryStudio:

- We create entry based on `inetOrgPerson` class.
- We define the following DN attributes:

Distinguished Name

Please select the parent of the new entry and enter the RDN.



Parent: dc=example,dc=com

RDN: ou = SearchGuard + -

DN Preview: ou=SearchGuard,dc=example,dc=com

- and other attributes including user's password:

Attributes

Please enter the attributes for the entry. Enter at least the MUST attributes.



DN: cn=HR Employee+ou=People,dc=example,dc=com



Attribute Description	Value
objectClass	inetOrgPerson (structural)
objectClass	organizationalPerson (structural)
objectClass	person (structural)
objectClass	top (abstract)
cn	HR Employee
sn	Employee
givenName	HR
mail	hr_employee@example.com
ou	People
uid	hr_employee
userPassword	Plain text password

Now we can use *ldapsearch*, from a command line on a docker's host, to check if the user was created correctly:

```
ldapsearch -h ldap.example.com \
-p 389 \
-D "cn=admin,dc=example,dc=com" \
-W \
-b "dc=example,dc=com" \
"uid=hr_employee"
```

The command parameters are applied to:

- -h and -p specify LDAP host and port,
- -D specifies distinguished name to bind within LDAP directory,
- -W prompt for simple authentication,
- -b the starting point for search.
- "uid=hremployee" stands for searching all the entries with an attribute uid equal to hremployee

This should output hr_employee user's attributes:

```
# HR Employee + People, example.com
dn: cn=HR Employee+ou=People,dc=example,dc=com
uid: hr_employee
mail: hr_employee@example.com
givenName: HR
ou: People
sn: Employee
cn: HR Employee
objectClass: inetOrgPerson
objectClass: organizationalPerson
objectClass: person
objectClass: top
userPassword:: cGFzcw==
```

Creating a sample group

Let us now create a sample group SearchGuard and add a *hremmployee* to it. We create LDAP entry of a class *groupOfNames_*:

Distinguished Name

Please select the parent of the new entry and enter the RDN.



Parent:	dc=example,dc=com		Browse...		
RDN:	cn	=	HR Employee	+	-
	ou	=	People	+	-
DN Preview:	cn=HR Employee+ou=People,dc=example,dc=com				

and add the member attribute *uid=hr_employee*:

Attributes

Please enter the attributes for the entry. Enter at least the MUST attributes.



DN: cn=SearchGuard,dc=example,dc=com



Attribute Description	Value
objectClass	groupOfNames (structural)
objectClass	top (abstract)
cn	SearchGuard
member	uid=hr_employee

Note that a group can have multiple member attributes for other members.

This ends our demo. We can now use the created setup for a demo Search Guard & LDAP integration that we show in the next article.

Where to go next

- Read the next article in this series about how to configure LDAP for Search Guard (upcoming)
- Read the [LDAP authentication configuration guidelines in our docs](#)
- Read the [LDAP authorisation guidelines in our docs](#)
- Download the [Search Guard Active Directory / LDAP presentation](#)

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