Manage accounts

Element Software

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In SolidFire storage systems, tenants can use accounts to enable clients to connect to volumes on a cluster. When you create a volume, it is assigned to a specific account. You can also manage cluster administrator accounts for a SolidFire storage system.

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For more information

- SolidFire and Element Software Documentation
- NetApp Element Plug-in for vCenter Server

Work with accounts using CHAP

In SolidFire storage systems, tenants can use accounts to enable clients to connect to volumes on a cluster. An account contains the Challenge-Handshake Authentication Protocol (CHAP) authentication required to access the volumes assigned to it. When you create a volume, it is assigned to a specific account.

An account can have up to two-thousand volumes assigned to it, but a volume can belong to only one account.

CHAP algorithms

Beginning with Element 12.7, secure FIPS compliant CHAP algorithms SHA1, SHA-256, and SHA3-256 are supported. When a host iSCSI initiator is creating an iSCSI session with an Element iSCSI target, it requests a list of CHAP algorithms to use. The Element iSCSI target chooses the first algorithm that it supports from the list requested by the host iSCSI initiator. To confirm that the Element iSCSI target chooses the most secure algorithm, you must configure the host iSCSI initiator to send a list of algorithms ordered from most secure, for example, SHA3-256, to least secure, for example, SHA1 or MD5. When SHA algorithms are not requested by the host iSCSI initiator, the Element iSCSI target chooses MD5, assuming the proposed algorithm list from the host contains MD5. You might need to update the host iSCSI initiator configuration to enable support for the secure algorithms.

During an Element 12.7 or later upgrade, if you have already updated the host iSCSI initiator configuration to send a session request with a list that includes SHA algorithms, as the storage nodes reboot, the new secure algorithms are activated and new or reconnected iSCSI sessions are established using the most secure protocol. All existing iSCSI sessions transition from MD5 to SHA during the upgrade. If you do not update the host iSCSI initiator configuration to request SHA, the existing iSCSI sessions will continue to use MD5. At a later date, after you update the host iSCSI initiator CHAP algorithms, the iSCSI sessions should transition gradually from MD5 to SHA over time based on maintenance activities that result in iSCSI session reconnects.

For example, the default host iSCSI initiator in Red Hat Enterprise Linux (RHEL) 8.3 has the `node.session.auth.chap_algs = SHA3-256,SHA256,SHA1,MD5` setting commented out which results in the iSCSI initiator only using MD5. Uncommenting this setting on the host and restarting the iSCSI initiator triggers iSCSI sessions from that host to start using SHA3-256.

If required, you can use the ListISCSISessions API method to see the CHAP algorithms being used for each session.

Create an account

You can create an account to allow access to volumes.

Each account name in the system must be unique.

1. Select **Management** > **Accounts**.
2. Click **Create Account**.
3. Enter a **Username**.
4. In the **CHAP Settings** section, enter the following information:

   Leave the credential fields blank to auto-generate either password.

   - **Initiator Secret** for CHAP node session authentication.
   - **Target Secret** for CHAP node session authentication.
5. Click **Create Account**.

View account details

You can view performance activity for individual accounts in a graphical format.

The graph information provides I/O and throughput information for the account. The Average and Peak activity levels are shown in increments of 10-second reporting periods. These statistics include activity for all volumes assigned to the account.

1. Select **Management** > **Accounts**.
2. Click the Actions icon for an account.
3. Click **View Details**.

Here are some of the details:

- **Status**: The status of the account. Possible values:
  - active: An active account.
  - locked: A locked account.
  - removed: An account that has been deleted and purged.
- **Active Volumes**: The number of active volumes assigned to the account.
- **Compression**: The compression efficiency score for the volumes assigned to the account.
- **Deduplication**: The deduplication efficiency score for the volumes assigned to the account.
- **Thin Provisioning**: The thin provisioning efficiency score for the volumes assigned to the account.
- **Overall Efficiency**: The overall efficiency score for the volumes assigned to the account.

Edit an account

You can edit an account to change the status, change the CHAP secrets, or modify the account name.

Modifying CHAP settings in an account or removing initiators or volumes from an access group can cause initiators to lose access to volumes unexpectedly. To verify that volume access will not be lost unexpectedly, always log out iSCSI sessions that will be affected by an account or access group change, and verify that initiators can reconnect to volumes after any changes to initiator settings and cluster settings have been completed.

Persistent volumes that are associated with management services are assigned to a new account that is created during installation or upgrade. If you are using persistent volumes, do not modify or delete their associated account.

1. Select **Management** > **Accounts**.
2. Click the Actions icon for an account.
3. In the resulting menu, select **Edit**.
4. **Optional:** Edit the **Username**.
5. **Optional:** Click the **Status** drop-down list and select a different status.

   Changing the status to **locked** terminates all iSCSI connections to the account, and the account is no longer accessible. Volumes associated with the account are maintained; however, the volumes are not iSCSI discoverable.

6. **Optional:** Under **CHAP Settings**, edit the **Initiator Secret** and **Target Secret** credentials used for node session authentication.

   If you do not change the **CHAP Settings** credentials, they remain the same. If you make the credentials fields blank, the system generates new passwords.

7. Click **Save Changes**.

Delete an account

You can delete an account when it is no longer needed.

Delete and purge any volumes associated with the account before you delete the account.

Persistent volumes that are associated with management services are assigned to a new account that is created during installation or upgrade. If you are using persistent volumes, do not modify or delete their associated account.

1. Select **Management** > **Accounts**.
2. Click the Actions icon for the account you want to delete.
3. In the resulting menu, select **Delete**.
4. Confirm the action.

Find more information

- SolidFire and Element Software Documentation
- NetApp Element Plug-in for vCenter Server

Manage cluster administrator user accounts

You can manage cluster administrator accounts for a SolidFire storage system by creating, deleting, and editing cluster administrator accounts, changing the cluster administrator password, and configuring LDAP settings to manage system access for users.

Storage cluster administrator account types

There are two types of administrator accounts that can exist in a storage cluster running NetApp Element software: the primary cluster administrator account and a cluster administrator account.

- **Primary cluster administrator account**

  This administrator account is created when the cluster is created. This account is the primary administrative account with the highest level of access to the cluster. This account is analogous to a root user in a Linux system. You can change the password for this administrator account.

- **Cluster administrator account**

  You can give a cluster administrator account a limited range of administrative access to perform specific tasks within a cluster. The credentials assigned to each cluster administrator account are used to authenticate API and Element UI requests within the storage system.

A local (non-LDAP) cluster administrator account is required to access active nodes in a cluster via the per-node UI. Account credentials are not required to access a node that is not yet part of a cluster.

View cluster admin details

1. To create a cluster-wide (non-LDAP) cluster administrator account, perform the following actions:
   a. Click **Users** > **Cluster Admins**.
2. On the Cluster Admins page of the Users tab, you can view the following information.
   - **ID**: Sequential number assigned to the cluster administrator account.
   - **Username**: The name given to the cluster administrator account when it was created.
   - **Access**: The user permissions assigned to the user account. Possible values:
     - read
     - reporting
     - nodes
     - drives
     - volumes

- accounts
- clusterAdmins
- administrator
- supportAdmin

> All permissions are available to the administrator access type.
>
> There are access types available through the API that aren't available in the Element UI.

- **Type**: The type of cluster administrator. Possible values:
  - Cluster
  - Ldap
- **Attributes**: If the cluster administrator account was created using the Element API, this column shows any name-value pairs that were set using that method.

  See NetApp Element Software API Reference.

Create a cluster administrator account

You can create new cluster administrator accounts with permissions to allow or restrict access to specific areas of the storage system. When you set cluster administrator account permissions, the system grants read-only rights for any permissions you do not assign to the cluster administrator.

If you want to create an LDAP cluster administrator account, ensure that LDAP is configured on the cluster before you begin.

Enable LDAP authentication with the Element user interface

You can later change cluster administrator account privileges for reporting, nodes, drives, volumes, accounts, and cluster-level access. When you enable a permission, the system assigns write access for that level. The system grants the administrator user read-only access for the levels that you do not select.

You can also later remove any cluster administrator user account created by a system administrator. You cannot remove the primary cluster administrator account that was created when the cluster was created.

1. To create a cluster-wide (non-LDAP) cluster administrator account, perform the following actions:
   a. Click **Users** > **Cluster Admins**.
   b. Click **Create Cluster Admin**.
   c. Select the **Cluster** user type.
   d. Enter a user name and password for the account and confirm password.
   e. Select user permissions to apply to the account.
   f. Select the check box to agree to the End User License Agreement.
   g. Click **Create Cluster Admin**.
2. To create a cluster administrator account in the LDAP directory, perform the following actions:
   a. Click **Cluster** > **LDAP**.
   b. Ensure that LDAP Authentication is enabled.

c. Click **Test User Authentication** and copy the distinguished name that appears for the user or one of the groups of which the user is a member so that you can paste it later.

d. Click **Users** > **Cluster Admins**.

e. Click **Create Cluster Admin**.

f. Select the LDAP user type.

g. In the Distinguished Name field, follow the example in the text box to enter a full distinguished name for the user or group. Alternatively, paste it from the distinguished name you copied earlier.

   If the distinguished name is part of a group, then any user that is a member of that group on the LDAP server will have permissions of this admin account.

   To add LDAP Cluster Admin users or groups the general format of the username is “LDAP:<Full Distinguished Name>”.

h. Select user permissions to apply to the account.

i. Select the check box to agree to the End User License Agreement.

j. Click **Create Cluster Admin**.

Edit cluster administrator permissions

You can change cluster administrator account privileges for reporting, nodes, drives, volumes, accounts, and cluster-level access. When you enable a permission, the system assigns write access for that level. The system grants the administrator user read-only access for the levels that you do not select.

1. Click **Users** > **Cluster Admins**.
2. Click the Actions icon for the cluster administrator you want to edit.
3. Click **Edit**.
4. Select user permissions to apply to the account.
5. Click **Save Changes**.

Change passwords for cluster administrator accounts

You can use the Element UI to change cluster administrator passwords.

1. Click **Users** > **Cluster Admins**.
2. Click the Actions icon for the cluster administrator you want to edit.
3. Click **Edit**.
4. In the Change Password field, enter a new password and confirm it.
5. Click **Save Changes**.

Related information

- Learn about the access types available for Element APIs
- Enable LDAP authentication with the Element user interface
- Disable LDAP
- NetApp Element Plug-in for vCenter Server

Manage LDAP

You can set up the Lightweight Directory Access Protocol (LDAP) to enable secure, directory-based login functionality to SolidFire storage. You can configure LDAP at the cluster level and authorize LDAP users and groups.

Managing LDAP involves setting up LDAP authentication to a SolidFire cluster using an existing Microsoft Active Directory environment and testing the configuration.

You can use both IPv4 and IPv6 addresses.

Enabling LDAP involves the following high-level steps, described in detail:

1. **Complete pre-configuration steps for LDAP support**. Validate that you have all of the details required to configure LDAP authentication.
2. **Enable LDAP authentication**. Use either the Element UI or the Element API.
3. **Validate the LDAP configuration**. Optionally, check that the cluster is configured with the correct values by running the GetLdapConfiguration API method or by checking the LCAP configuration using the Element UI.
4. **Test the LDAP authentication** (with the `readonly` user). Test that the LDAP configuration is correct either by running the TestLdapAuthentication API method or by using the Element UI. For this initial test, use the username “sAMAccountName” of the `readonly` user. This will validate that your cluster is configured correctly for LDAP authentication and also validate that the `readonly` credentials and access are correct. If this step fails, repeat steps 1 through 3.
5. **Test the LDAP authentication** (with a user account that you want to add). Repeat setp 4 with a user account that you want to add as an Element cluster admin. Copy the `distinguished` name (DN) or the user (or the group). This DN will be used in step 6.
6. **Add the LDAP cluster admin** (copy and paste the DN from the Test LDAP authentication step). Using either the Element UI or the AddLdapClusterAdmin API method, create a new cluster admin user with the appropriate access level. For the username, paste in the full DN you copied in Step 5. This assures that the DN is formatted correctly.
7. **Test the cluster admin access**. Log in to the cluster using the newly created LDAP cluster admin user. If you added an LDAP group, you can log in as any user in that group.

Complete pre-configuration steps for LDAP support

Before you enable LDAP support in Element, you should set up a Windows Active Directory Server and perform other pre-configuration tasks.

Steps

1. Set up a Windows Active Directory Server.
2. **Optional:** Enable LDAPS support.
3. Create users and groups.
4. Create a read-only service account (such as “sfreadonly”) to be used for searching the LDAP directory.

Enable LDAP authentication with the Element user interface

You can configure storage system integration with an existing LDAP server. This enables LDAP administrators to centrally manage storage system access for users.

You can configure LDAP with either the Element user interface or the Element API. This procedure describes how to configure LDAP using the Element UI.

This example shows how to configure LDAP authentication on SolidFire and it uses `SearchAndBind` as the authentication type. The example uses a single Windows Server 2012 R2 Active Directory Server.

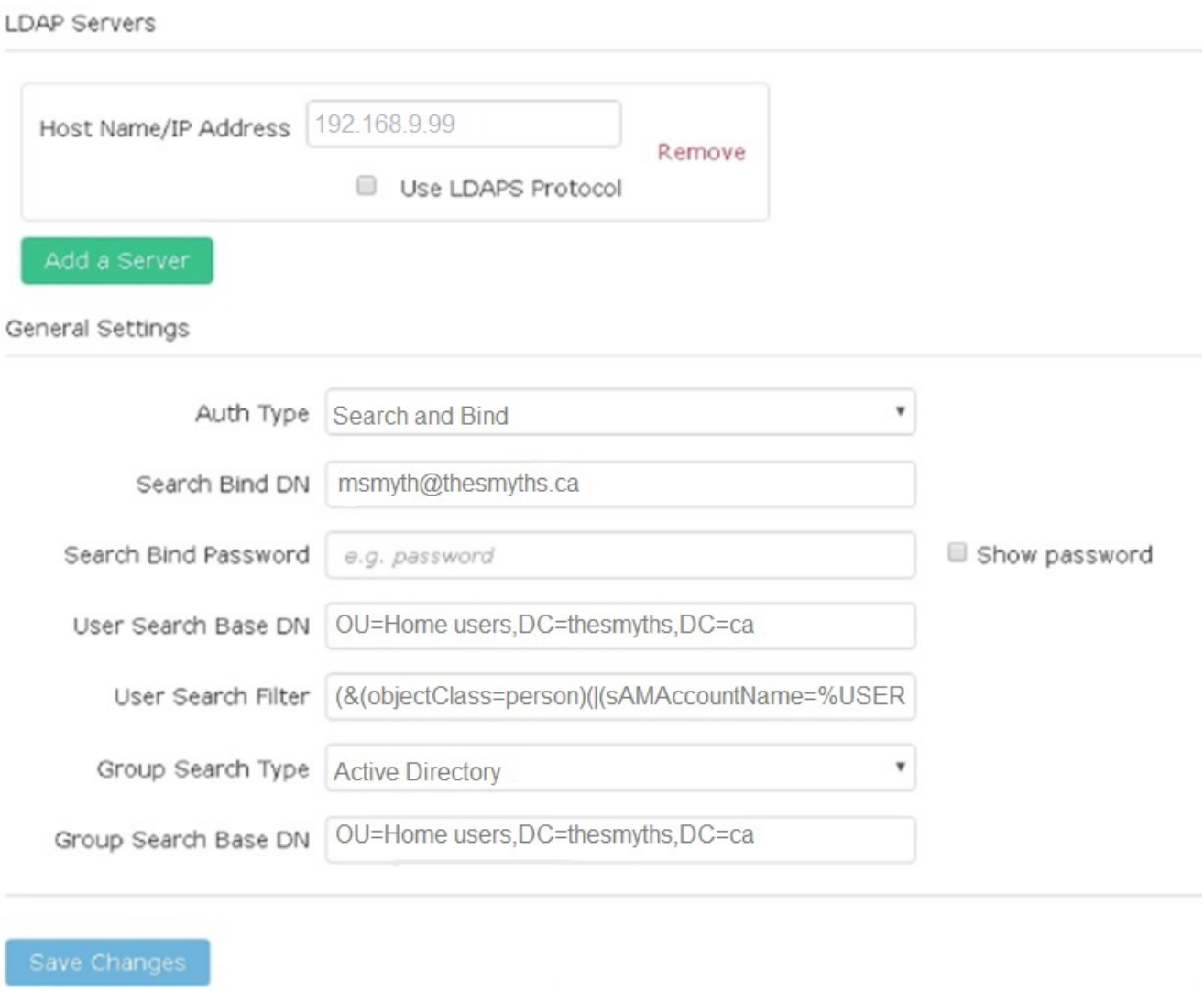
Steps

1. Click **Cluster** > **LDAP**.
2. Click **Yes** to enable LDAP authentication.
3. Click **Add a Server**.
4. Enter the **Host Name/IP Address**.

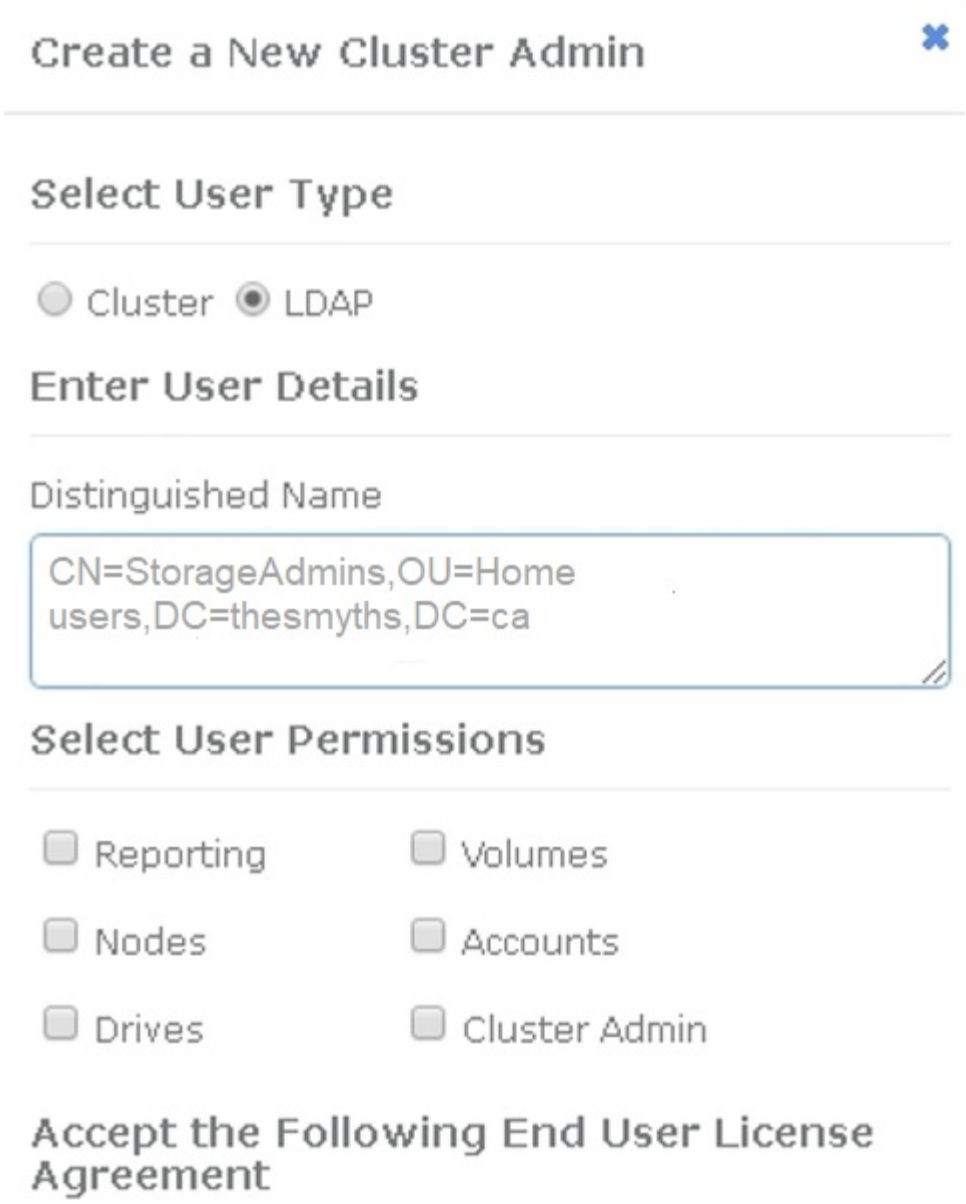
   An optional custom port number can also be entered.

   For example, to add a custom port number, enter <host name or ip address>:<port number>

5. **Optional:** Select **Use LDAPS Protocol**.
6. Enter the required information in **General Settings**.



7. Click **Enable LDAP**.
8. Click **Test User Authentication** if you want to test the server access for a user.
9. Copy the distinguished name and user group information that appears for use later when creating cluster administrators.
10. Click **Save Changes** to save any new settings.
11. To create a user in this group so that anyone can log in, complete the following:
    a. Click **User** > **View**.



b. For the new user, click **LDAP** for the User Type, and paste the group you copied to the Distinguished Name field.
c. Select the permissions, typically all permissions.
d. Scroll down to the End User License Agreement and click **I accept**.
e. Click **Create Cluster Admin**.

   Now you have a user with the value of an Active Directory group.

To test this, log out of the Element UI and log back in as a user in that group.

Enable LDAP authentication with the Element API

You can configure storage system integration with an existing LDAP server. This enables LDAP administrators to centrally manage storage system access for users.

You can configure LDAP with either the Element user interface or the Element API. This procedure describes

how to configure LDAP using the Element API.

To leverage LDAP authentication on a SolidFire cluster, you enable LDAP authentication first on the cluster using the `EnableLdapAuthentication` API method.

Steps

1. Enable LDAP authentication first on the cluster using the `EnableLdapAuthentication` API method.
2. Enter the required information.

```
{
     "method":"EnableLdapAuthentication",
     "params":{
          "authType": "SearchAndBind",
          "groupSearchBaseDN": "dc=prodtest,dc=solidfire,dc=net",
          "groupSearchType": "ActiveDirectory",
          "searchBindDN": "SFReadOnly@prodtest.solidfire.net",
          "searchBindPassword": "ReadOnlyPW",
          "userSearchBaseDN": "dc=prodtest,dc=solidfire,dc=net ",
          "userSearchFilter":
"(&(objectClass=person)(sAMAccountName=%USERNAME%))"
          "serverURIs": [
               "ldap://172.27.1.189",
          [
     },
  "id":"1"
}
```

3. Change the values of the following parameters:

Parameters used	Description
authType: SearchAndBind	Dictates that the cluster will use the readonly service account to first search for the user being authenticated and subsequently bind that user if found and authenticated.
groupSearchBaseDN: dc=prodtest,dc=solidfire,dc=net	Specifies the location in the LDAP tree to begin searching for groups. For this example, we've used the root of our tree. If your LDAP tree is very large, you might want to set this to a more granular sub-tree to decrease search times.
userSearchBaseDN: dc=prodtest,dc=solidfire,dc=net	Specifies the location in the LDAP tree to begin searching for users. For this example, we've used the root of our tree. If your LDAP tree is very large, you might want to set this to a more granular sub-tree to decrease search times.

Parameters used	Description
groupSearchType: ActiveDirectory	Uses the Windows Active Directory server as the LDAP server.

`userSearchFilter: "(&(objectClass=person)(sAMAccountName=%USERNAME%))"`
 	
To use the userPrincipalName (email address for login) you could change the userSearchFilter to:
 	
`"(&(objectClass=person)(userPrincipalName=%USERNAME%))"`
 	
Or, to search both userPrincipalName and sAMAccountName, you can use the following userSearchFilter:
 	
`"(&(objectClass=person)(`
	(sAMAccountName=%USERNAME%)(userPrincipalName=%USERNAME%)))" ----

Leverages the sAMAccountName as our username for logging in to the SolidFire cluster. These settings tell LDAP to search for the username specified during login in the sAMAccountName attribute and also limit the search to entries that have “person” as a value in the objectClass attribute.	searchBindDN
This is the distinguished name of readonly user that will be used to search the LDAP directory. For active directory it’s usually easiest to use the userPrincipalName (email address format) for the user.	searchBindPassword

To test this, log out of the Element UI and log back in as a user in that group.

View LDAP details

View LDAP information on the LDAP page on the Cluster tab.

> You must enable LDAP to view these LDAP configuration settings.

1. To view LDAP details with the Element UI, click **Cluster** > **LDAP**.
   - **Host Name/IP Address**: Address of an LDAP or LDAPS directory server.

- **Auth Type**: The user authentication method. Possible values:
  - Direct Bind
  - Search And Bind
- **Search Bind DN**: A fully qualified DN to log in with to perform an LDAP search for the user (needs bind-level access to the LDAP directory).
- **Search Bind Password**: Password used to authenticate access to the LDAP server.
- **User Search Base DN**: The base DN of the tree used to start the user search. The system searches the subtree from the specified location.
- **User Search Filter**: Enter the following using your domain name:

```
(&(objectClass=person)(|(sAMAccountName=%USERNAME%)(userPrincipalName=%USERNAME%)))
```

- **Group Search Type**: Type of search that controls the default group search filter used. Possible values:
  - Active Directory: Nested membership of all of a user's LDAP groups.
  - No Groups: No group support.
  - Member DN: Member DN-style groups (single-level).
- **Group Search Base DN**: The base DN of the tree used to start the group search. The system searches the subtree from the specified location.
- **Test User Authentication**: After LDAP is configured, use this to test the user name and password authentication for the LDAP server. Enter an account that already exists to test this. The distinguished name and user group information appears, which you can copy for later use when creating cluster administrators.

Test the LDAP configuration

After configuring LDAP, you should test it by using either the Element UI or the Element API `TestLdapAuthentication` method.

Steps

1. To test the LDAP configuration with the Element UI, do the following:
   a. Click **Cluster** > **LDAP**.
   b. Click **Test LDAP Authentication**.
   c. Resolve any issues by using the information in the table below:

Error message	Description
`xLDAPUserNotFound`	• The user being tested was not found in the configured `userSearchBaseDN` subtree. • The `userSearchFilter` is configured incorrectly.

Error message	Description
`xLDAPBindFailed (Error: Invalid credentials)`	• The username being tested is a valid LDAP user, but the password provided is incorrect. • The username being tested is a valid LDAP user, but the account is currently disabled.
`xLDAPSearchBindFailed (Error: Can't contact LDAP server)`	The LDAP server URI is incorrect.
`xLDAPSearchBindFailed (Error: Invalid credentials)`	The read-only username or password is configured incorrectly.
`xLDAPSearchFailed (Error: No such object)`	The `userSearchBaseDN` is not a valid location within the LDAP tree.
`xLDAPSearchFailed (Error: Referral)`	• The `userSearchBaseDN` is not a valid location within the LDAP tree. • The `userSearchBaseDN` and `groupSearchBaseDN` are in a nested OU. This can cause permission issues. The workaround is to include the OU in the user and group base DN entries, (for example: `ou=storage, cn=company, cn=com`)

2. To test the LDAP configuration with the Element API, do the following:
   a. Call the TestLdapAuthentication method.

```
{
  "method":"TestLdapAuthentication",
     "params":{
        "username":"admin1",
        "password":"admin1PASS
      },
      "id": 1
}
```

   b. Review the results. If the API call is successful, the results include the specified user's distinguished name and a list of groups in which the user is a member.

```
{
"id": 1
     "result": {
         "groups": [

"CN=StorageMgmt,OU=PTUsers,DC=prodtest,DC=solidfire,DC=net"
         ],
         "userDN": "CN=Admin1
Jones,OU=PTUsers,DC=prodtest,DC=solidfire,DC=net"
     }
}
```

Disable LDAP

You can disable LDAP integration using the Element UI.

Before you begin, you should note all the configuration settings, because disabling LDAP erases all settings.

Steps

1. Click **Cluster** > **LDAP**.
2. Click **No**.
3. Click **Disable LDAP**.

Find more information

- SolidFire and Element Software Documentation
- NetApp Element Plug-in for vCenter Server

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