

PingDirectory™

Release 3.4.0

Delegated Admin Application Guide



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PingDirectory™ Product Documentation

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Delegated Admin overview

Delegated Admin from Ping Identity Corp is an add-on to PingDirectory that enables the delegation of user and group management.

Introduction

Many organizations spend a disproportionate, and often wasteful, amount of time resetting passwords, updating account data, and completing other simple but recurring tasks. Delegated Admin lets organizations assign these responsibilities, as well as others associated with the management of identities in PingDirectory Server, to a subset of administrators. Such *delegated administrators* can be any user outside the organization's IT department, including a customer.

The following employees typically fulfill roles that involve at least a basic level of identity management:

- Help desk or customer service representatives who unlock and reset passwords
- Managers and Human Resources administrators who update employee profiles
- Application administrators who update identity attributes and manage access to applications

These employees represent strong candidates for inclusion in a group of delegated administrators.

Features

Delegated Admin lets delegated administrators complete the following tasks across groups, subtrees, and entire organizations:

- Create, view, and search user profiles
- Update user attributes
- Enable and disable accounts
- Reset locked accounts
- Create and edit groups
- Manage the membership of groups and subgroups
- Manage the roles of users and groups

Install Delegated Admin

Depending on your environment and the location of your installation, different options and procedures are available when you install Delegated Admin. Before attempting to install the application, make certain that you complete the tasks in [Prerequisites](#) on page 6, and in [Before you install](#) on page 7.

Installation locations

Delegated Admin can be installed in any of the following locations:

- PingDirectory Server, including replicated instances
- PingDirectoryProxy Server
- External web server

The location that you choose determines the steps that you must perform to install Delegated Admin.

Prerequisites

Regardless of the location of your Delegated Admin installation, make certain the following Ping Identity products are installed and configured before attempting to install Delegated Admin.

Product	Description	Minimum Version
PingDirectory Server	Stores user-identity data. The HTTPS port that was configured during PingDirectory Server setup is required to install Delegated Admin. For information about upgrading PingDirectory Server, see Upgrade PingDirectory Server on page 23. For information about installing and configuring PingDirectory Server, refer to <i>PingDirectory Server Administration Guide</i> .	7.2.1.0
PingFederate Server	Provides identities for authentication and authorization. For information about installing and configuring PingFederate Server, see Configure PingFederate Server on page 26, or refer to <i>PingFederate Server Guide</i> .	9.0

Obtain the installation files

To obtain the Delegated Admin installation files, perform the following steps:

1. Download the Delegated Admin installation package, `pingdirectory-delegator-{version}.zip`, to the server on which you plan to install the application.
2. Extract the contents of the installation package.
3. Copy the folder named `/delegator` and its contents to the appropriate directory, as shown by the following table.

Server	Directory
PingDirectory Server	/webapps
Replicated instance of PingDirectory Server	/webapps

Server	Directory
PingDirectoryProxy Server	/webapps
External web server	Directory for web-based apps

Before you install

If you plan to install Delegated Admin on PingDirectory Server or a replicated instance of PingDirectory Server, complete the relevant tasks in this section before installing the application.

PingDirectory Server

If you are installing Delegated Admin on a PingDirectory Server installation that had "Install with sample data" chosen as the installation option, remove the relevant Access Control Information (ACI) from the PingDirectory Server base entry. For more information, refer to the LDIF file `delegator/remove-sample-directory-data-aci.ldif`.

If you are installing Delegated Admin on a PingDirectory Server installation that did not have "Install with sample data" chosen as the installation option, proceed to [Obtain the installation files](#) on page 6.

Replicated instance of PingDirectory Server

If you plan to install Delegated Admin on a replicated instance of PingDirectory Server, perform the following steps:

1. Make certain that replication is enabled for the PingDirectory Servers.

For information about enabling server replication, refer to *PingDirectory Server Administration Guide*.

2. To ensure that configuration changes are applied to all the servers in your topology, configure the PingDirectory Servers to use a configuration group called `all-servers`, as follows:

```
$ bin/dsconfig set-global-configuration-prop \
  --set configuration-server-group:all-servers
```

3. If you are installing Delegated Admin on a replicated PingDirectory Server that had "Install with sample data" chosen as the installation option, remove the relevant Access Control Information (ACI) from the PingDirectory Server base entry.

Because replicated instances share the same data, perform this step against only one of the servers. For more information, refer to the LDIF file `delegator/remove-sample-directory-data-aci.ldif`.

If you are installing Delegated Admin on a PingDirectory Server installation that did not have "Install with sample data" chosen as the installation option, proceed to [Obtain the installation files](#) on page 6.

Install the application

The steps for installing Delegated Admin depend on whether you are setting up the application in a Unix/Linux or Windows environment.

Unix or Linux

To begin installing Delegated Admin in a Unix or Linux environment, run the following script in the `/delegator` directory from [Obtain the installation files](#) on page 6:

```
$ ./set-up-delegator.sh
```

The system generates a configuration file named `config.js` and a batch file named `delegated-admin.dsconfig`.

Windows

To begin installing Delegated Admin in a Windows environment, perform the following steps:

1. In the Delegated Admin application directory, copy or rename the file `example.config.js` to `config.js`. `config.js` contains comments and placeholders for necessary information. For example, the client ID that is required in this file must be one of the client IDs that has been defined for the PingFederate configuration. This value represents the client intended for token issuance, such as `dadmin`.
2. Open `config.js` in a text editor.
3. Change the variable values to match your setup configuration, as the following table shows.

config.js Variable	Value
<code>window.PF_HOST</code>	Public address of the PingFederate Server to which the application redirects the user's browser when logging on
<code>window.PF_PORT</code>	PingFederate port number
<code>window.DADMIN_CLIENT_ID</code>	PingFederate Client ID for the application

4. Save your changes to `config.js`.
5. Copy or rename the batch file `delegated-admin-template.dsconfig` to `delegated-admin.dsconfig`.
6. Open `delegated-admin.dsconfig` in a text editor and replace the variables (`${variable}`) with actual values.
7. Save your changes to `delegated-admin.dsconfig`.

All environments

Regardless of whether you are installing Delegated Admin in a Unix/Linux or Windows environment, perform the relevant steps in this section after you complete the previous OS-specific tasks.

PingDirectoryProxy Server

If you are installing Delegated Admin on PingDirectoryProxy Server, perform the following steps on all instances of PingDirectory Server:

1. Open the batch file `delegated-admin.dsconfig` in a text editor.
2. Configure the following elements exactly as they are configured on PingDirectoryProxy Server:
 - Virtual-attribute Delegated Admin Privilege
 - Global ACI Authenticated access to the multi-update extended request for the Delegated Admin API
 - Global ACI Authenticated access to the no-op request control for the Delegated Admin API
3. Remove the following elements and sections:
 - Web-application-extension Delegator
 - Access-token-validator PingFederateValidator
 - Definition `rest-resource-type`
 - Definition `delegated-admin-rights`
4. Save your changes to `delegated-admin.dsconfig`.

Replicated instances of PingDirectory Server

If you are installing Delegated Admin on one or more replicated instances of PingDirectory Server, apply the following commands in `delegated-admin.dsconfig` to each instance:

```
$ ./bin/dsconfig \
--bindDN "cn=Directory Manager" \
--no-prompt \
--batch-file webapps/delegator/delegated-admin.dsconfig \
--applyChangeTo server-group
```

External web server

If you are installing Delegated Admin on an external web server, perform the following steps:

1. Open `config.js` in a text editor.
2. Change the variable values to specify the location of PingDirectory Server, as the following table shows.

config.js Variable	Value
<code>window.DS_HOST</code>	Hostname of PingDirectory Server
<code>window.DS_PORT</code>	HTTPS port of PingDirectory Server

To view an example outline that features these settings, refer to `example.config.js`.

3. Save your changes to `config.js`.
4. Open `delegated-admin.dsconfig` in a text editor.
5. Comment out the following lines, which are located in the `Configure the delegator web app` section, near the bottom of the file:

```
dsconfig create-web-application-extension --extension-name Delegator --
set base-context-path:/delegator --set document-root-directory:webapps/
delegator/app
dsconfig set-connection-handler-prop --handler-name "HTTPS Connection
Handler" --add web-application-extension:Delegator
dsconfig set-connection-handler-prop --handler-name "HTTPS Connection
Handler" --set enabled:false
dsconfig set-connection-handler-prop --handler-name "HTTPS Connection
Handler" --set enabled:true
```

6. Save your changes to `delegated-admin.dsconfig`.
7. Create a CORS policy for the Delegated Admin HTTP servlet extension, where `<origin>` represents the public name of the host, proxy, or load balancer that presents the Delegated Admin web application:

```
dsconfig create-http-servlet-cross-origin-policy --policy-name "Delegated
Admin Cross-Origin Policy" --set "cors-allowed-methods: GET" --set "cors-
allowed-methods: OPTIONS" --set "cors-allowed-methods: POST" --set "cors-
allowed-methods: DELETE" --set "cors-allowed-methods: PATCH" --set "cors-
allowed-origins: <origin>"
dsconfig set-http-servlet-extension-prop --extension-name "Delegated
Admin" --set "cross-origin-policy:Delegated Admin Cross-Origin Policy"
```

All locations except replicated PingDirectory Server instances

To continue installing Delegated Admin on PingDirectory Server, PingDirectoryProxy Server, or an external web server, apply the following commands in `delegated-admin.dsconfig` to the appropriate server:

```
$ ./bin/dsconfig \  
--bindDN "cn=Directory Manager" \  
--no-prompt \  
--batch-file webapps/delegator/delegated-admin.dsconfig
```

Next steps

After you finish installing Delegated Admin, visit `https://webserverHost:httpPort/delegator` to view the application's **Sign On** page. At this time, you cannot log on to Delegated Admin because the rights of the delegated administrators have not been configured. For more information about configuring administrative rights, the REST resource type, session timeout values, and other properties, see [Configure Delegated Admin](#) on page 11.

After you configure Delegated Admin, [verify that the application is installed](#) and working successfully.

Configure Delegated Admin

This chapter describes the necessary configuration to support Delegated Admin after the application is installed successfully.

At a minimum, you must configure the following properties on PingDirectory Server:

- Delegated administrator rights
- REST resource type
- Attributes and attribute searching

Configuration overview

Delegated Admin must have a PingDirectory Server and PingFederate Server installed. For installation instructions, refer to the documentation for each product.

The process of configuring support for Delegated Admin on PingDirectory Server includes the following tasks:

- Configure users as Delegated Admin administrators.
- Configure attributes and attribute searching.
- Configure groups whose management requires delegation

The process of configuring PingFederate Server includes the following tasks:

- Configure PingFederate as the identity provider for Delegated Admin.
- Configure PingFederate as the OAuth server for Delegated Admin.
- Register Delegated Admin as a client.
- Register PingDirectory Server as an OAuth token validator client.

Authentication configuration

The delegated administrator logs on to Delegated Admin through the PingFederate Server, which is configured as the authentication server and OpenID Connect (OIDC) provider. PingFederate validates the user's credentials against PingDirectory Server, encapsulates information `claims` about the user's identity, and issues an access token to Delegated Admin, which presents the token to PingDirectory Server in the HTTP Authorization request header.

Interaction with PingDirectory Server

PingDirectory Server is configured to accept access tokens by using Access Token Validators. The values that PingFederate Server sets for the access token `sub` claim must be mappable to a distinguished name (DN) in PingDirectory Server. Setting up an access token validator for use with Delegated Admin requires some coordination with the server configuration. In the suggested default configuration, the access token contains the `entryUUID` of the administrator user entry in the `sub` claim. This value is mapped back to a PingDirectory Server entry by using an Exact Match Identity Mapper.

Authorization by PingDirectory Server

After validation, PingDirectory Server checks the Delegated Admin configuration for authorization of the delegated administrator. Users or groups of users are authorized as delegated administrators in the PingDirectory Server Administrator Console, or with the `dsconfig` tool.

Configure authentication

Before installing and configuring Delegated Admin, configure the following OAuth clients within PingFederate:

- Delegated Admin, which obtains an OIDC token that describes the authenticated user
- PingDirectory Server itself, which calls PingFederate to validate the OIDC token that Delegated Admin passes to it

Specifically, the Delegated Admin OAuth client must be configured as follows:

- The client ID is `dadmin` and requires no client secret key.
- The redirect URL is `https://webserverHost:httpPort/delegator/*`, where `webserverHost:httpPort` represents the public host and port of the web application.



Note: If you specify 443 as the `httpPort` number, some web browsers might strip the value from the URL. In this scenario, we recommend using both of the following redirect URLs:

- `https://webserverHost/delegator/*`
- `https://webserverHost:443/delegator/*`
- The grant type is `Implicit`.
- The OIDC policy uses JWT tokens, where the `entryUUID` of the user is passed through the `sub` claim of the OIDC token.

Configure the PingDirectory Server OAuth client as follows:

- The client ID is `pingdirectory` and requires a secret key.
- The grant type is `Access Token Validation`.

For more information about configuring PingFederate Server, see [Configure PingFederate Server](#) on page 26.

Configure delegated administrator rights on PingDirectory Server

To use Delegated Admin, an administrator must possess more than valid credentials and an access token that PingDirectory Server can validate. He or she must possess rights that are designated through the PingDirectory Server configuration. To delegate users or groups as administrators, use the PingDirectory Server Administrator Console (Delegated Admin rights and resource rights) or the `dsconfig create-delegated-admin-rights` and `create-delegated-admin-resource-rights` commands.

The example commands in this section illustrate the configuration options for delegated administration and are performed on PingDirectory Server.



Note: Delegated administrators who manage only users in specified groups cannot create new users, and a new user cannot be assigned to one of the specified groups when created. Further, administrators who manage only specific subtrees cannot create users in an organization that does not reside under, or at the same level as, one of the subtrees.

- The following commands restrict an administrator to manage users in specified subtrees:

```
$ bin/dsconfig create-delegated-admin-rights \
  --rights-name admin1 \
  --set "admin-user-dn:uid=admin1,ou=people,dc=example,dc=com"
  --set enabled:true

$ bin/dsconfig create-delegated-admin-resource-rights \
  --rights-name admin1 \
  --rest-resource-type users \
  --set admin-scope:resources-in-specific-subtrees \
  --set "resource-subtree:ou=org1,dc=example,dc=com" \
  --set admin-permission:create \
  --set admin-permission:read \
  --set admin-permission:update \
  --set admin-permission:delete \
```

```
--set enabled:true
```

- An administrator can be restricted to managing the member users of one or more specified groups. In the following example, we assume the existence of a static or dynamic group entry whose members include the users to be managed:

```
$ bin/dsconfig create-delegated-admin-rights \
--rights-name admin1 \
--set "admin-user-dn:uid=admin1,ou=people,dc=example,dc=com"
--set enabled:true
$ bin/dsconfig create-delegated-admin-resource-rights \
--rights-name admin1 \
--rest-resource-type users \
--set admin-scope:resources-in-specific-groups \
--set "resources-in-group:cn=User Group,dc=example,dc=com" \
--set admin-permission:read \
--set admin-permission:update \
--set enabled:true
```

- Rather than delegate a single user as an administrator, you might find it more convenient to delegate an entire group of users as administrators, as follows:

```
$ bin/dsconfig create-delegated-admin-rights \
--rights-name admin-group1 \
--set "admin-group-dn:cn=Admin Group,ou=people,dc=example,dc=com"
--set enabled:true

$ bin/dsconfig create-delegated-admin-resource-rights \
--rights-name admin-group1 \
--rest-resource-type users \
--set admin-scope:all-resources-in-base \
--set admin-permission:create \
--set admin-permission:read \
--set admin-permission:update \
--set admin-permission:delete \
--set enabled:true
```

In this example, groups can be configured to manage specific subtrees or groups with the `resources-in-specific-subtrees` or `resources-in-group` setting for the `admin-scope`. For more information about PingDirectory Server administrators and configuring dynamic and static groups, refer to the *PingDirectory Server Administration Guide*.

Configure user self-service

PingFederate Server provides end users with the ability to self-service their own profiles. To enable this capability, additional configuration is required on the `user` REST resource type in PingDirectory Server.

Before attempting to configure the REST resource type, ensure that you have already configured profile management by users on PingFederate Server. For more information, refer to "Configure profile management by users" and "Set up PingDirectory for customer identities" in the *PingFederate Administrator's Manual*.

Configure the REST resource type as follows:

```
$ bin/dsconfig set-rest-resource-type-prop --type-name users \
--add auxiliary-ldap-objectclass:pf-connected-identities \
--set post-create-constructed-attribute:pf-connected-identity
```



Important: To ensure that you can view users who are already defined in the directory, add the auxiliary object class `pf-connected-identities` to all existing users in your PingDirectory Server.

Configure attributes and attribute search on PingDirectory Server

The file that installs Delegated Admin also specifies the following values:

- Object class of user entries through `structural-ldap-objectclass:inetOrgPerson`
- Number of user attributes to expose



Note: Delegated Admin supports the following attribute types:

- Boolean
- Integer
- String
- DateTime

1. If necessary, change the attribute that is designated as the primary attribute.

```
$ bin/dsconfig set-rest-resource-type-prop \
  --type-name users \
  --set primary-display-attribute-type:mail
```

2. Configure any additional user attributes to appear in Delegated Admin by specifying the LDAP attribute type to expose and by providing a display name for it.

```
$ bin/dsconfig create-delegated-admin-attribute \
  --type-name users \
  --attribute-type customAttr
  --set "display-name:My custom attribute"
```

3. Use the following command to set the search filter, where `%%` represents the search text entered in the web application:

```
$ bin/dsconfig set-rest-resource-type-prop \
  --type-name users \
  --set 'search-filter-pattern:(|(cn=%%*) (mail=%%*) (uid=%%*))'
```

When search text is entered in Delegated Admin, the property `search-filter-pattern` specifies which attributes to search in PingDirectory Server. To satisfy the query, define the appropriate attribute indexes for PingDirectory Server. For more information, refer to *PingDirectory Server Administration Guide*.

4. To manage users whose profiles feature a large number of attributes, place the attributes in logical groupings, called *attribute categories*, and give them a specific display order.

The following commands create attribute categories and specify their display order:

```
$ bin/dsconfig create-delegated-admin-attribute-category \
  --display-name "Basic Information" \
  --set display-order-index:1

$ bin/dsconfig create-delegated-admin-attribute-category \
  --display-name "Contact Information" \
  --set display-order-index:2

$ bin/dsconfig create-delegated-admin-attribute-category \
  --display-name "Other Attributes" \
  --set display-order-index:3
```

5. The following example commands assign attributes to a category and specify the display order of each attribute within its category.

```
$ bin/dsconfig set-delegated-admin-attribute-prop \
  --type-name users \
  --attribute-type cn \
  --set "attribute-category:Basic Information" \
  --set display-order-index:1
```

```
$ bin/dsconfig set-delegated-admin-attribute-prop \
--type-name users \
--attribute-type sn \
--set "attribute-category:Basic Information" \
--set display-order-index:2
```

Unassigned attributes are displayed in a miscellaneous category.

Users and groups

Delegated administrators can be configured to manage users and groups in PingDirectory Server, as follows:

- Create new entries
- Read, view, and search existing entries
- Edit and update existing entries

The following sections describe users and groups in more detail.

Enable user creation

Enable the creation of new users and resources by configuring either a parent entry distinguished name (DN) or parent resource type where new users will be located. If you configure a parent DN, the entry that it references must exist in PingDirectory Server. All new users are created in this single location. If necessary, use `ldapmodify` to create the parent entry. For more information about the `ldapmodify` tool or about command-line help, refer to the *PingDirectory Server Administration Guide*. Alternatively, if a parent resource type is configured, the administrator can choose the specific resource where the new user is created.



Note: Delegated Admin cannot list organizations in which the delegated administrator is unable to manage user entries. Delegated administrators who manage only users in specified groups cannot create new users, and a new user cannot be assigned to a specified group when created. Further, administrators who manage only specific subtrees cannot create users in an organization that does not reside under, or at the same level as, one of the subtrees.

The following example specifies a single location for new users on PingDirectory Server:

```
$ bin/dsconfig set-rest-resource-type-prop \
--type-name users \
--set "parent-dn:ou=people,dc=example,dc=com" \
--reset parent-resource-type
```

The setup script creates a resource type named `orgs`, which works with entries that feature the `organization` objectClass.

The following example shows that any organization resource can function as the location for new users on PingDirectory Server:

```
$ bin/dsconfig set-rest-resource-type-prop \
--type-name users \
--reset parent-dn \
--set parent-resource-type:orgs
```

A different resource type can be created for `organizationalUnit` objectClass entries, as follows:

```
$ bin/dsconfig create-rest-resource-type \
--type-name orgUnits \
--set "display-name:Organizational Units" \
--set primary-display-attribute-type:ou \
--set "search-filter-pattern: (&(objectClass=organizationalUnit) (ou=%%)) " \
--set structural-ldap-objectclass:organizationalUnit \
--set enabled:false

$ bin/dsconfig create-delegated-admin-attribute \
--type-name orgUnits \
--attribute-type ou \
--set "display-name:Organizational Unit"

$ bin/dsconfig set-rest-resource-type-prop \
--type-name orgUnits \
--set enabled:true
```

The new resource type can be referenced as a `parent-resource-type`.

By default, new entries are named by their server-generated `entryUUID` values. To change this behavior, configure the LDAP RDN attribute.



Note: The RDN attribute type must also be configured as a Delegated Admin attribute. For more information, see [Configure attributes and attribute search on PingDirectory Server](#) on page 14. Do not set read-only attributes as the RDN attribute.

In the following example, `uid` names new entries and becomes a required attribute:

```
$ bin/dsconfig set-rest-resource-type-prop \
--type-name users \
--set create-rdn-attribute-type:uid
```

New users are always created with their configured structural LDAP objectclass. One or more auxiliary LDAP objectclasses can be specified, as the following example shows:

```
$ bin/dsconfig set-rest-resource-type-prop \
--type-name users \
--set auxiliary-ldap-objectclass:ubidPersonAux
```

When existing users without all of the specified auxiliary objectclasses are edited, the missing objectclasses are updated automatically.

Manage groups

Use the following commands to delegate a user as a group administrator:

```
$ bin/dsconfig create-delegated-admin-rights \
--rights-name group-admin1 \
--set "admin-user-dn:uid=admin1,ou=people,dc=example,dc=com"
--set enabled:true

$ bin/dsconfig create-delegated-admin-resource-rights \
--rights-name group-admin1 \
--rest-resource-type groups \
--set admin-scope:resources-in-specific-subtrees \
--set "resource-subtree:ou=Groups,dc=example,dc=com" \
--set admin-permission:manage-group-membership \
--set admin-permission:create \
--set admin-permission:read \
--set admin-permission:update \
--set admin-permission:delete \
--set enabled:true

$ bin/dsconfig create-delegated-admin-resource-rights \
--rights-name group-admin1 \
--rest-resource-type users \
--set admin-scope:resources-in-specific-subtrees \
--set "resource-subtree:ou=org1,dc=example,dc=com" \
--set admin-permission:read \
--set enabled:true
```

The administrative scope for users determines which users are visible to the group administrator. In this example, all users in the subtree `ou=org1,dc=example,dc=com` are visible. An administrator can be configured to edit users as well as to manage group memberships.

The group administrator can view, add, and remove any of the users within their administrative scope to the membership of groups within the groups' administrative scope. Static groups can be nested. Users who belong indirectly to a group through nesting are visible as group members but cannot be removed. Users can be removed only from the group of which they are a member. For example, an Employees group might include a Developers group as a nested member. In such a scenario, a user in the Developers group is a direct member of that group and an indirect member of Employees. This member can be removed only when viewing the Developers group, not when viewing the Employees group.

If a group is configured as a dynamic or virtual static group rather than a static group, then the group and its members are visible, but the group membership cannot be modified.

Set group attributes

The default settings for group attributes specify `cn` and `description` as group attributes, with `cn` used for the group title in Delegated Admin. To create the default settings, use the following commands with a search DN and parent DN ("`dc=example,dc=com`"):

```
$ bin/dsconfig create-rest-resource-type \
--type group \
--type-name groups \
--set "display-name:Groups" \
--set enabled:false \
--set "search-base-dn:dc=example,dc=com" \
--set primary-display-attribute-type:cn \
--set resource-endpoint:groups \
--set "search-filter-pattern:(cn=%%*)" \
--set structural-ldap-objectclass:groupOfUniqueNames
--set parent-dn:dc=example,dc=com

$ bin/dsconfig create-delegated-admin-attribute \
--type-name groups \
--attribute-type cn \
--set "display-name:Name"

$ bin/dsconfig create-delegated-admin-attribute \
--type-name groups \
--attribute-type description \
--set "display-name:Description"

$ bin/dsconfig set-rest-resource-type-prop \
--type-name groups \
--set enabled:true
```

Set group search filter

When entering text to search for groups, the groups' `search-filter-pattern` property specifies the attributes to be searched in PingDirectory Server. To satisfy the query, define the appropriate attribute indexes for PingDirectory Server. The default setting searches the attribute `cn` for the search text, which is represented by `%%`. Use the following command to set the group search filter:

```
$ bin/dsconfig set-rest-resource-type-prop \
--type-name groups \
--set 'search-filter-pattern:(cn=%%*)'
```

For more information about managing groups, refer to *PingDirectory Server Administrator Guide*.

Create a group

Users can be added as members to groups that delegated administrators create and manage. Subgroups can also be added as members to a group.

The configuration for each delegated group type consists of the following elements:

- Group REST resource type – Defines the attributes to locate groups in the directory information tree (DIT).
- Parent DN or Parent resource type – Specifies the location in which to create groups in the DIT.
 - To specify a Parent DN for a resource type, type the value in the **Parent DN** text box in the **Resource Creation** section. The Parent DN is often identical to the Search Base DN, such as `ou=customers,ou=Groups,dc=example,dc=com`.
 - To specify a Parent resource type, select a value from the **Parent Resource Type** list box in the **Resource Creation** section. Delegated administrators are subsequently presented with a list box that lets them select a resource, and the group is created under the selected parent resource. If you specify a Parent resource type, set

a value for the **Primary Display Attribute Type** in the **Delegated Admin** section. This setting determines the values that are displayed in the Delegated Admin GUI. For example, a Primary Display attribute type of `ou` displays the `ou` value in the list box for each resource within the Parent resource type.

- Attributes to present to the delegated administrators.

To configure a Group REST resource type, use the **Edit Group REST Resource Type** page in the PingData Administrator Console. The **Search Base DN** value in the **General Configuration** section determines the data structure that is searched in Delegated Admin, and the **Display Name** value in the **Delegated Admin** section specifies the label of the REST resource in the Delegated Admin GUI.

PingData Administrator Console		Delegated Admin
UI Element	Page and Section	UI Element on Create a New Group Page
Display Name	General Configuration > Delegated Admin	Select a Type label
REST Resource Type	Edit Delegated Admin Rights > Delegated Admin Resource Rights	Select a Type option
Parent Resource Type	General Configuration > Resource Creation	Display name for Parent resource type
Display Name	General Configuration > Delegated Admin Attributes	Additional elements like CN, Description, Business Category, and Organization

Add a user to a group

Users can be added to groups from the **Manage Users** page as well as from the **Manage Groups** page.

Add a user from the Manage Users page

To add a user from the **Manage Users** page, perform the following steps:

1. In Delegated Admin, click **Manage Users**.
2. Select or search for the user to add to a group.
3. Expand the user profile.
4. Click **Edit**.
5. Click **Groups**.
6. Select or search for the appropriate group.
7. From the **Nonmember Groups** list, click + to the right of the group.
The group is moved to the **Member Groups** list.

Add a user from the Manage Groups page

To add a user from the **Manage Groups** page, perform the following steps:

1. In Delegated Admin, click **Manage Groups**.
2. Select or search for the appropriate group.
3. Expand the group profile.
4. Click **Edit**.
5. Select or search for the appropriate user.
6. From the **Nonmembers** list, click + to the right of the user.
The user is moved to the **Members** list.

Generic resource types

Use *generic resource types* to manage LDAP entries that are neither users nor groups, as follows:

- Create new entries
- Read, view, and search existing entries
- Edit and update existing entries

A generic resource type can represent a device, for example, or can be used for organizational unit branch entries that are parents of other resources.

Define a generic resource type

Generic resources can be defined for any structural LDAP object class, and can function as members of a group. The following example enables the management of device entries:

```
$ bin/dsconfig create-rest-resource-type \
--type-name device \
--set enabled:true \
--set resource-endpoint:device \
--set "display-name:Device" \
--set structural-ldap-objectclass:device \
--set search-base-dn:dc=example,dc=com \
--set parent-dn:dc=example,dc=com \
--set 'search-filter-pattern:(cn=%*)' \
--set primary-display-attribute-type:cn

$ bin/dsconfig create-delegated-admin-attribute \
--type-name device \
--attribute-type cn \
--set "display-name:Device Name" \
--set display-order-index:1

$ bin/dsconfig create-delegated-admin-attribute \
--type-name device \
--attribute-type serialNumber \
--set "display-name:Serial Number" \
--set display-order-index:2
```

After you define a generic resource type, create Delegated Admin resource rights for it. For more information, see [Configure delegated administrator rights on PingDirectory Server](#) on page 12.

Enable the referential integrity plug-in

When a REST resource type is set to create new entries using an RDN attribute other than `entryUUID`, referential integrity issues can result when the entry's RDN attribute is edited. To preserve the referential integrity of group memberships in such a scenario, enable the referential integrity plug-in, as follows:

```
bin/dsconfig set-plugin-prop --plugin-name "Referential Integrity" \
--set enabled:true
```

After the plug-in is enabled, group memberships are preserved.

Enable log tracing

Log tracing can be enabled for OAuth token processing, HTTP request and response actions, and API debugging.

To view OAuth token processing and full HTTP request/response tracing, enable the debug trace logger, as follows:

```
$ bin/dsconfig set-log-publisher-prop \
  --publisher-name 'Debug Trace Logger' \
  --set enabled:true
```

To enable dadmin API debug logging, use the following commands:

```
$ bin/dsconfig create-debug-target \
  --publisher-name 'File-Based Debug Logger' \
  --target-name com.unboundid.directory.server.http \
  --set debug-level:VERBOSE
```

```
$ bin/dsconfig create-debug-target \
  --publisher-name 'File-Based Debug Logger' \
  --target-name com.unboundid.directory.server.extensions.dadmin \
  --set debug-level:VERBOSE
```

```
$ bin/dsconfig create-debug-target \
  --publisher-name 'File-Based Debug Logger' \
  --target-name com.unboundid.directory.broker.api \
  --set debug-level:VERBOSE
```

```
$ bin/dsconfig set-log-publisher-prop \
  --publisher-name 'File-Based Debug Logger' \
  --set enabled:true
```

Change the application logo

To change the Ping logo to your corporate logo, add the following line to the configuration file `config.js`:

```
window.HEADER_BAR_LOGO = '<filename>';
```

Support for corporate logos includes, but is not limited to, the following file types:

- JPG
- PNG
- SVG

Add the logo to the build directory, making certain to use the same file name that you specified earlier. The corporate logo appears in the header, and the Ping logo becomes relegated to the sidebar, in grayscale, with a "Powered by" line above it.

To maintain an appropriate aspect ratio, logo images are resized in Delegated Admin to a height of 22px and a maximum width of 150px.

Configure the session timeout

By default, Delegated Admin features an idle session timeout value of 30 minutes. To adjust this value, perform the following steps:

1. Open the configuration file `config.js` in a text editor.
2. Add the following line, where `{TimeoutValue}` is an integer that represents, in minutes, the session timeout value:

```
window.TIMEOUT_LENGTH_MINS={TimeoutValue};
```

To view an example outline that features this setting, refer to `example.config.js`.

3. Save your changes to `config.js`.

Verify the installation

To verify that Delegated Admin is installed successfully, visit `https://webserverHost:httpPort/delegator` and log on to the application.

If your logon attempt is unsuccessful, see [Enable log tracing](#) on page 20, and use your browser's debug feature to gain insight into the token-validation process.

Upgrade Delegated Admin

Ping Identity periodically issues software with new features, enhancements, and fixes for improved performance. Administrators can use the PingDirectory Server's `update` tool to upgrade the current code version.

This chapter presents some update scenarios and the related implications to consider when upgrading your version of Delegated Admin.

Upgrade PingDirectory Server

Before attempting to upgrade Delegated Admin to the current version, ensure that you are running version 7.2.1.0 or later of PingDirectory Server. If you are already running PingDirectory Server 7.2.1.0 or later, proceed to [Upgrade the application](#) on page 25.

Overview and considerations

The process of upgrading PingDirectory Server involves downloading and extracting a new version of the PingDirectory Server ZIP file on the server to be updated, and running the `update` utility with the `--serverRoot` or `-R` option value from the new root server pointing to the installation to be upgraded.

Consider the following when upgrading replicating servers:

- Upgrade affects only the server being upgraded. The process does not alter the configuration of other servers.
- The `update` tool will verify that the version of Java that is installed meets the new server requirements. To simplify the process, install the version of Java that is supported by the new server before running the tool.
- To be safe, backup the user data (`userRoot`) before an upgrade. Restoring from a backup could be necessary if all other servers in the replication topology have been upgraded and a database or encoding change in the new server version prevents the database from being used with the older server version. The `update` and `revert-update` utilities will issue a warning when this is the case.
- Temporarily raise the replication purge delay for all servers in the topology to cover the expected downtime for maintenance. This will result in a temporary increase in disk usage for the `replicationChanges` database stored in `<server-root>/changelogDb`.
- Replication does not need to be disabled on a server before an upgrade.
- Make sure upgraded servers are working as expected before upgrading the last server in the topology
- Enable new features after all replicating servers are upgraded.

Update servers in a topology

An update to the current PingDirectory Server release includes significant changes as well as the introduction of a topology registry, which stores information that was stored previously in the admin backend, such as server instances, instance and secret keys, server groups, and administrator user accounts. For the admin backend to be migrated, the `update` tool must be provided LDAP authentication options to the peer servers of the server being updated.

The LDAP connection security option requested (either plain, TLS, StartTLS, or SASL) must be configured on every server in the topology. The LDAP credentials must be present on every server in the topology, and must have permissions to read from the admin backend and the config backend of every server in the topology. For example, a root DN user with the `inherit-default-privileges` set to true (such as the `cn=Directory Manager` user) that exists on every server can be used.

After enabling or fixing the configuration of the LDAP connection handler(s) to support the desired connection security mechanism on each server, run the following `dsframework` command on the server being updated so that its admin backend has the most up-to-date information:

```
$ bin/dsframework set-server-properties \
  --serverID serverID \
  --set ldapport:port \
  --set ldapsport:port \
  --set startTLSEnabled:true
```

The update tool will verify that the following conditions are satisfied on every server in the topology before allowing the update:

- When the first server is being updated, all other servers in the topology must be online. When updating additional servers, all topology information will be obtained from one of the servers that has already been updated. The update tool will connect to the peer servers of the server being updated to obtain the necessary information to populate the topology registry. The provided LDAP credentials must have read permissions to the config and admin backends of the peer servers.
- The instance name is set on every server, and is unique across all servers in the topology. The instance name is a server's identifier in the topology. After all servers in the topology have been updated, each server will be uniquely identified by its instance name. Once set, the name cannot be changed. If needed, the following command can be used to set the instance name of a server prior to the update:

```
$ bin/dsconfig set-global-configuration-prop \
  --set instance-name:uniqueName
```

- The cluster-wide configuration is synchronized on all servers in the topology. Older versions have some topology configuration under `cn=cluster, cn=config` (JSON attribute and field constraints). These items did not support mirrored cluster-wide configuration data. An update should avoid custom configuration changes on a server being overwritten with the configuration on the mirrored subtree master. To synchronize the cluster-wide configuration data across all servers in the topology, run the `config-diff` tool on each pair of servers to determine the differences, and use `dsconfig` to update each instance using the `config-diff` output. For example:

```
$ bin/config-diff --sourceHost hostName \
  --sourcePort port \
  --sourceBindDN bindDN \
  --sourceBindPassword password \
  --targetHost hostName \
  --targetPort port \
  --targetBindDN bindDN \
  --targetBindPassword password
```

If any of these conditions are not satisfied, the update tool will list all of the errors encountered for each server, and provide instructions on how to fix them.

Upgrade PingDirectory Server



Important: When running the update tool to upgrade PingDirectory Server, make certain to use the option `--skipMirroredSubtreeUpdateTask`.

To upgrade PingDirectory Server, perform the following steps:

1. Download and extract the new version of PingDirectory Server to a location outside the existing server's installation.

For these steps, assume that the existing server installation resides in `/prod/PingDirectory`, and that the new server version is extracted to `/home/stage/PingDirectory`.

2. To upgrade the existing PingDirectory Server, run the `update` tool that is provided with the new server package, as follows:


```
$ /home/staging/PingDirectory/update --serverRoot /prod/PingDirectory \
--skipMirroredSubtreeUpdateTask
```

If the tool detects any degree of customization, it might prompt for confirmation on server configuration changes.

Upgrade the application

In DA 3.3.0 and earlier, the setup script assigned a cross-origin resource sharing (CORS) policy to the Delegated Admin HTTP servlet extension. This policy is potentially insecure because the CORS setting `Allowed-Origin` permits requests that use a wildcard to allow requests from any origin. Unless you have made changes to secure this policy, remove it, as follows:

```
dsconfig set-http-servlet-extension-prop --extension-name "Delegated Admin"
--reset "cross-origin-policy"
dsconfig delete-http-servlet-cross-origin-policy --policy-name "Delegated
Admin Cross-Origin Policy"
```


 **Important:** Beginning with Delegated Admin 3.2.0 and PingDirectory Server 7.2.1.0, the following configuration changes were made:

- `delegated-admin-resource-type` was replaced with `rest-resource-type`.
- `delegated-administrator` was replaced with `delegated-admin-rights` and `delegated-admin-resource-rights`.

As a result, Delegated Admin 3.0.2 or earlier requires PingDirectory Server 7.2.0.1 or earlier. Similarly, Delegated Admin 3.2.0 or later requires PingDirectory Server 7.2.1.0 or later.

The `update` tool converts earlier configurations to new configuration definitions. This tool is also used during the process of upgrading PingDirectory Server.

The migrated Delegated Admin configuration features a `group` REST resource type for the structural object classes `groupOfNames` and `groupOfUniqueNames`. If the original user's resource type configuration includes a value for `Org Search Filter`, then the migrated configuration also features a generic `orgs` REST resource type, with the structural object class `organizationalUnit` as the parent resource type of users. If necessary, change the structural object class on the resource type configuration after the Delegated Admin update completes.

 **Note:** If you change the structural object class, you must stop the server to proceed with the update.

To upgrade Delegated Admin on PingDirectory Server, perform the following steps:

1. Extract the contents of the Delegated Admin upgrade ZIP file.
2. Rename the original `delegator` folder to retain a backup copy of the earlier version.
3. Copy the extracted folder named `delegator` to the PingDirectory Server folder named `webapps`.
4. Copy the configuration file `config.js` to the new `delegator` folder.

`config.js` is located in `{OriginalDelegatorFolder}/app/config.js`.

5. Restart PingDirectory Server.

For more information, including details about upgrading the RPM package and reverting an update, refer to the *PingDirectory Server Administration Guide*.

Configure PingFederate Server

PingFederate offers many configuration options. This appendix provides an example PingFederate configuration that supports Delegated Admin.

PingFederate configuration

The following is a sample PingFederate configuration. Minimal support for Delegated Admin includes configuring PingFederate to use the HTML Form Adapter to authenticate users for Delegated Admin, and configuring PingFederate to identify an authenticated user through the user's entryUUID, which is mapped to the `subject` of the OIDC token.



Note: Some of the PingFederate interface terms have changed from version 9.0 to the latest version. The terminology in this sample configuration represents version 9.2.

Configure PingFederate as the identity provider

This procedure configures the PingFederate Server as the identity provider for PingDirectory Server.



Note: Before starting, download the LDAPS certificate from PingDirectory Server. All other steps are performed on the PingFederate server. For more information, refer to *PingDirectory Server Administration Guide*.

1. Click **System > Protocol Settings > Roles and Protocols**.
2. Under **Enable OAuth 2.0 Authorization Server (AS) role**, select **OpenID Connect**.
3. Upload the PingDirectory Server LDAPS certificate in **Security > Trusted CAs**.
4. Add an LDAP data store in **System > Data Stores**. Specify:
 - a) The PingDirectory Server hostname and LDAPS port.
 - b) Select **Use LDAPS**.
 - c) Under **Advanced**, clear the **Verify LDAPS hostname** option.
 - d) Click **Next**.
 - e) Click **Done**.
 - f) Click **Save**.
5. Create the HTML form **IdP Adapter and Password Credential Validator** that is used to authenticate users against PingDirectory Server:
 - a) Select **Identity Provider > Adapters > Create New Instance**.
 - b) Select the HTML Form type.
 - c) Click **Next**, scroll to the bottom of the page, and click **Manage Password Credential Validators**.
 - d) Select **Create New Instance**.
 - e) Click **Next** and select the LDAP Username Password Credential Validator.
 - f) Click **Next** and enter the following search filter to use the email address or username to log on to the system:


```
(| (uid=${username}) (mail=${username}))
```
 - g) Click **Next** and extend the contract with `entryUUID` and `cn`.
These values are used later.
 - h) Click **Next**, **Done**, and **Save** until the Create Adapter Instance screen.
 - i) Add a new row to Password Credential Validators, choose the new LDAP Password Credential Validator, and click **Update**.
 - j) Click **Next** and extend the contract with `entryUUID` and `cn`.
These values are used later.

- k) Select `entryUUID` for a pseudonym, and then click **Next**, **Next**, **Done**, and **Save**.
6. Enable session tracking in **Identity Provider > Sessions**, and select the **Track adapter session for logout** and **Enable authentication sessions for all sources** options.
7. Click **Save**.

Configure the OAuth server

1. Click **IdP Adapter Mapping** and add the new IdP adapter for creating OAuth grants.
An additional attribute source is unnecessary. Fulfill the contract with the `USER_KEY` from adapter `entryUUID` and with the `USER_NAME` from adapter `cn`, and then click **Next**, **Next**, and **Save**.
2. Select an existing instance or click **Access Token Management > Create New Instance**.
If selecting an existing instance, JSON Web Tokens (JWTs) are configured automatically:
 - a) If creating a new instance, select **JSON Web Tokens**.
If selecting an existing instance, click **Instance Configuration**.
 - b) Choose one-way encryption for JWT, which only requires a symmetric key (not a certificate and private key).
This step requires the client to validate the token by hitting the validation endpoint on the server.
 - c) Add a row to symmetric keys and use 32 bytes or 64 chars of hex.
 - d) Choose the JWS Algorithm HMAC using SHA-256.
 - e) Choose your symmetric key for Active Symmetric Key ID and click **Next**.
 - f) Select all options and click **Next**.
 - g) List at least one attribute to be defined in the access token, add `sub`, and click **Save**.
3. Click **Access Token Mapping** and map the access token attributes from the persistent grant, as follows:
 - a) Choose **Default Context** and the new Access Token Manager.
 - b) Click **Contract Fulfillment**.
 - c) In the **sub** row, make the following selections:
 - From the **Source** list box, select `Persistent Grant`.
 - From the **Value** list box, select `USER_KEY`.
 - d) Click **Save**.
4. Click **OpenID Connect Policy Management > Add Policy**.
 - a) Choose the previously created Access Token Manager and click **Next**.
 - b) Delete all extended contract attributes except `sub`.
Other scopes are defined, if configured.
 - c) Click **Next** to reach Contract Fulfillment.
 - d) Fulfill the OIDC contract `sub` with the Access Token attribute `sub`.
 - e) Click **Next** and then click **Done**.
 - f) If a default OIDC policy is not already defined, set this new policy as the default, and click **Save**.
5. Add scopes for PingDirectory Server APIs.
 - a) Click **Scope Management > Exclusive Scopes**.
 - b) Add a value and description for `urn:pingidentity:directory-delegated-admin`.
 - c) Click **Save**.

Configure PingDirectory Server as the token validator

When creating a PingFederate Access Token Validator in PingDirectory Server, use the `pingdirectory` client ID and secret. PingDirectory Server uses an identity mapper to match the `sub` claim against the `entryUUID` attribute.

To configure PingDirectory Server as the token validator, perform the following steps:


1. Click **Create new client**.
2. For both the **Client ID** and **Name**, specify `pingdirectory`.

3. Make the following selections:
 - In the **Client Authentication** section, select `Client Secret`.
 - In the **Client Secret** section, select `Change Secret`.
4. Click **Generate Secret** to generate a new secret key.
5. Copy the secret key.
6. In the **Allowed Grant Types** section, select **Access Token Validation**.
7. Click **Save**.

Configure Delegated Admin as a new client

To configure Delegated Admin as a new client, perform the following steps:

1. Click **Create new client**.
2. For both the **Client ID** and **Name**, specify `dadmin`.

 **Note:** Do not configure authentication.
3. Define the redirect URI as `"https://${directoryServer:httpPort}/delegator/*"`, using the hostname and HTTPS listener port for PingDirectory Server.
4. Make the following selections:
 - Select **Bypass Authorization Approval**.
 - Select **Allow Exclusive Scopes**, and then select `urn:pingidentity:directory-delegatedadmin`.
 - For the **Grant Type**, select `Implicit`.
 - Select the default ATM that was created previously for Delegated Admin.
 - Select the OIDC policy that was created previously.
5. Click **Save**.
6. Click **OAuth Server > Authorization Server Settings > Allowed Origin Settings**.
7. Add `"https://${directoryServer:httpPort}"` to the Allowed origins, using the hostname and HTTPS listener port for PingDirectory Server.
8. Click **Save**.

Configure profile management by users

Users created by delegated administrators can manage their own profiles through PingFederate. Additional configuration steps must be taken to enable users whom delegated administrators create to manage their own profiles through the PingFederate local identity profile-management feature.

This example assumes PingDirectory Server and PingFederate are configured for local identity profile management, following the PingFederate administrator documentation for Customer IAM. Specifically, the `entryUUID` attribute of the user record must be mapped to the subject of the local identity profile contract in PingFederate's Authentication Policies contract fulfillment.

1. On PingFederate Server, copy the LDIF file `local-identity-pingdirectory.ldif` from the following location:


```
<pf_install>/pingfederate/server/default/conf/local-identity/ldif-scripts/
local-identity-pingdirectory.ldif
```
2. Use the command `scp` to securely copy the LDIF file to your local machine.
3. Update the LDAP schema, as follows:
 - a) Log on to the PingDirectory Server Administrator Console.
 - b) Click **LDAP Schema > Schema Utilities**.
 - c) Click **Import Schema Element**.
 - d) Copy the schema changes from the file `<pf_install>/pingfederate/server/default/conf/local-identity/ldif-scripts/local-identity-pingdirectory.ldif`.

- e) Paste the schema changes into the text area.
 - If you are creating a new organizational unit as part of the LDIF import, edit the DN information.
 - f) Click **Import**.
4. On PingDirectory Server, create a constructed attribute for `pf-connected-identity` (for example where the `entryUUID` is the PingFederate user ID attribute):

```
$ bin/dsconfig create-constructed-attribute \  
  --attribute-name pf-connected-identity \  
  --set attribute-type:pf-connected-identity \  
  --set value-pattern:auth-source=pf-local-identity:user-id={entryUUID}
```

After you finish installing Delegated Admin, make certain that you configure the REST resource type. For more information, see [Configure user self-service](#) on page 13.

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