ICE LDAP Configuration on ICE Server

Product guide for prerelease

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1 Document history

Publication Date	Product Release	Notes
May 28, 2024	3.5.1	Added description for the 'Cache LDAP Credentials' feature.
April 15, 2024	3.5.0	Updated to reflect new ICE Desktop UI.
October 10, 2023	3.4.0	Updated examples for bulk and non-bulk import search filters.
September 28, 2023	3.4.0	Significant rewrite to better organize information. Added bulk import feature. Added group synchronization.
July 24, 2023	3.3.0	Updated *'Complete AD LDS configuration on the ICE Desktop'* and *'Other Login Features'* sections with new features and screenshots.
December 1, 2022	3.2.0	New release.
September 26, 2022	3.1.2	Release updates.
March 15, 2022	3.1.0	Document created.

2 Introduction

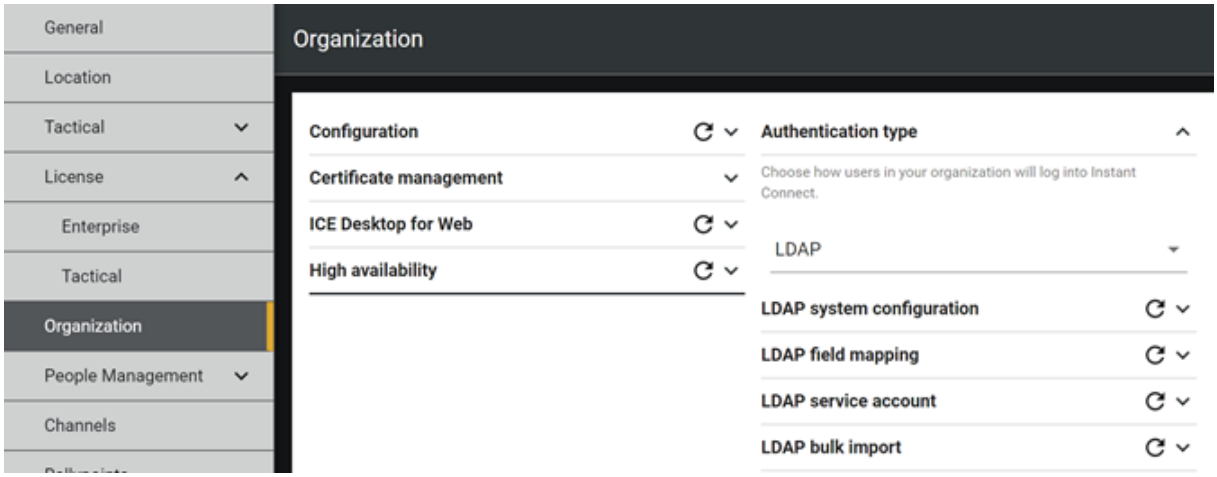
LDAP (Lightweight Directory Access Protocol) provides simplified, centralized resources and security administration for large organizations. ICE Server supports any LDAP service that allows authentication using email address, such as Microsoft Active Directory Lightweight Directory Services (AD LDS). The LDAP configuration information detailed below assumes the use of AD LDS, as it is the most commonly deployed LDAP solution.

The supported versions of AD LDS are:

- Windows Server 2016
- Windows Server 2012 R2
- Windows Server 2012
- Windows Server 2008 R2

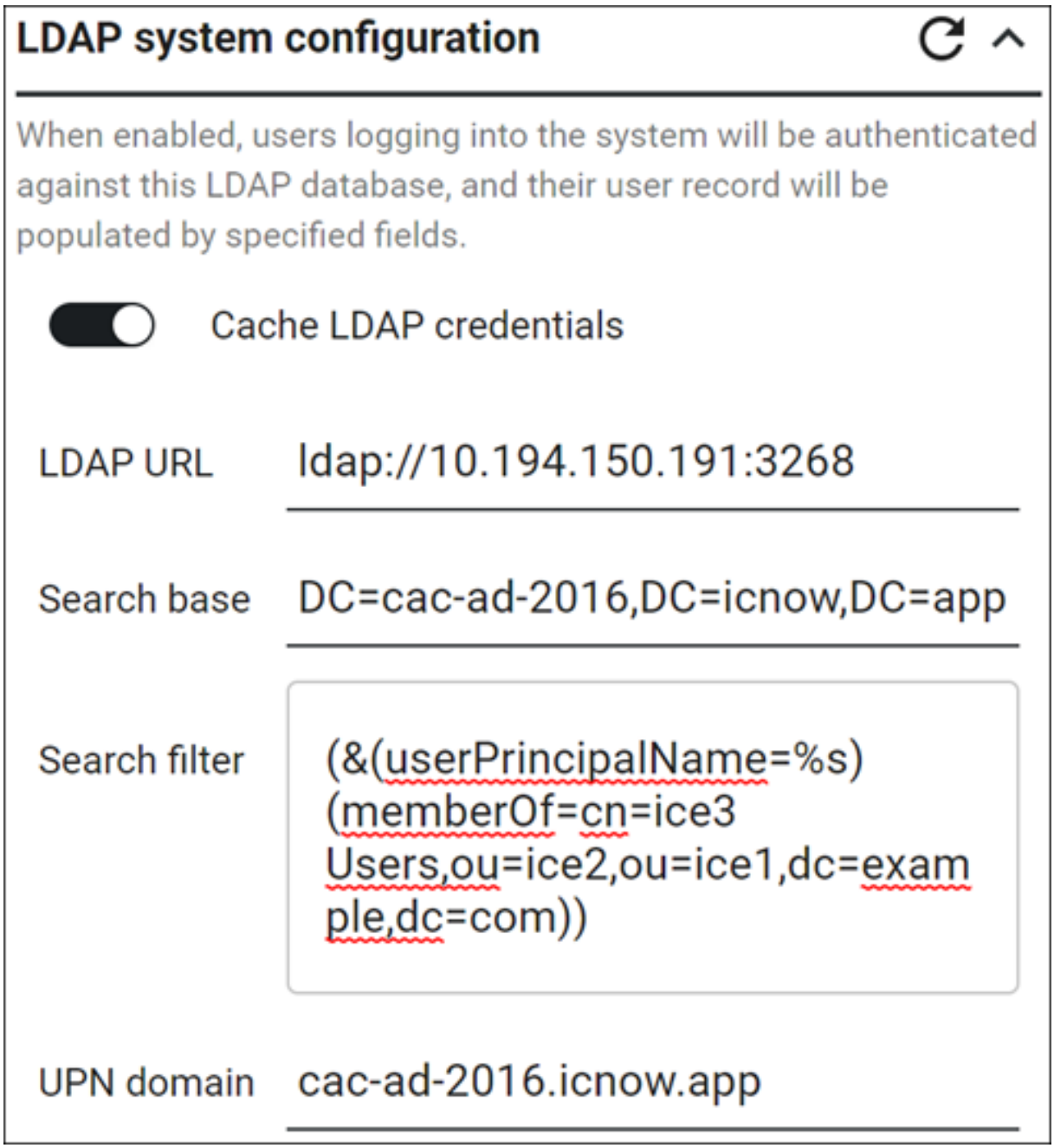
When enabled, users login to ICE Server using their AD email address (`userPrincipalName`). ICE users authenticated through AD LDS are assigned a standard user role on the ICE Server.

Begin by opening ICE Desktop and navigating to *Settings* > *Organization* > *Authentication type*. and select 'LDAP'. This adds the LDAP system configuration, field mapping, service account, and bulk import screens.



> **Note:** Do ***not*** pre-create any user accounts on ICE Server which are meant to be managed thru LDAP user authentication! When a user logs into ICE Server for the first time using LDAP authorization, a standard ICE user account is automatically created for them. ***After*** that initial login and standard account creation, ICE admins may adjust the user role as needed, e.g., make them an admin user or workflow admin.
>
> **Note:** We recommend using Microsoft Active Directory Explorer to browse your LDAP for mappable values. The following Active Directory values are inherited from LDAP, changes to these values must be done on the Active Directory server:
>
> - First name
> - Last name
> - Password
> - Display name
> - Email address

3 LDAP system configuration



Object	Description	Typical Value
Cache LDAP Credentials	When enabled, LDAP credentials will be stored locally and users will be authenticated against the cached credential whenever LDAP server cannot be reached.**Note**: This feature only works for users who have previously logged into ICE using a valid LDAP credential. It will not work for bulk-imported users who have not previously logged in.	
LDAP URL	Begins with either the `ldaps://` or `ldap://` protocol prefix, followed by the URL of the URL of the server responding to LDAP search requests. For `ldaps://` the server is communicating over an SSL connection.	For secure (SSL-enabled) LDAP:ldaps://`the active directory server name`:636 (or 3269)For non-secure (non-SSL) LDAP:.ldap://`the active directory server name`:389 (or 3268)
Search base	Defines the starting point for the search in the Active Directory tree.	Search base ***must*** be the top node of the AD tree for ICE Server users. All AD users who will be ICE Server users ***must*** belong to the same LDAP directory tree or sub-tree.
Search filter	Defines the LDAP query for searching users based on mapping of username to a particular LDAP attribute: `userPrincipalName`.	See the 'Search filters' section below.
UPN domain	The name of the Active Directory domain.	The value should be either the domain name of the Active Directory or an alternate UPN domain name.**Note:** ICE Server can only map to one `userPrincipalName` domain at a time.

3.1 Search filter

To understand a search filter, follow its path by reading it from right to left. The right-most component is the root of the tree, then follow the branch to the left-most component, which is the node (leaf) where the user will be found. For example, the following search filter…

```
(&(userPrincipalName=%s)(memberOf=cn=ice3 Users,ou=ice2,ou=ice1,dc=example,dc=com))
```

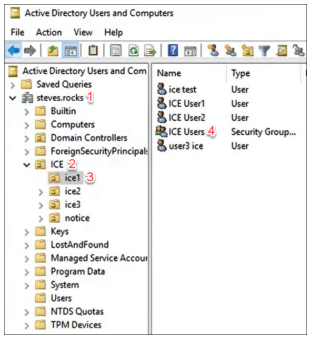
…can be read as:

- In Domain Component (DC)=`com`, find DC=`example` (the search base)
- In DC=`example`, find Organizational Unit (OU)=`ice1`
- In OU=`ice1`, find OU=`ice2`
- In OU=`ice2`, find the Common Name (CN)=`ice3 Users`
- In CN=`ice3`, find `userPrincipalName=%s` (the user)

Define a search filter to bulk import from multiple branches of the same search base using the following template:

```
(&(objectClass=person)(|(memberOf=cn=ice3 Users,ou=ice2,ou=ice1,dc=example,dc=com)(memberOf=cn=iceb Users,ou=icea,ou=ice1,dc=example,dc=com)))
```

This is a visual example of another AD tree as displayed in AD Explorer:



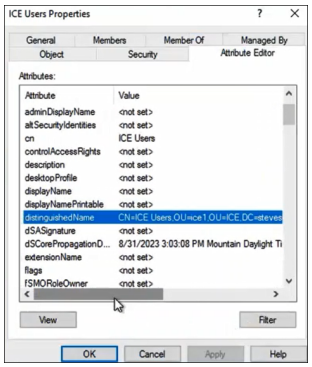
A search filter looking for a user in the `ICE Users` group, would look like this:

```
(&(userPrincipalName=%s)(memberOf=cn=ICE Users,ou=ice1,ou=ICE,dc=steves,dc=rocks))
```

1. steves.rocks: `dc=steves,dc=rocks`
2. ICE: `ou=ICE`
3. ice1: `ou=ice1`
4. ICE Users: `memberOf=cn=ICE Users`

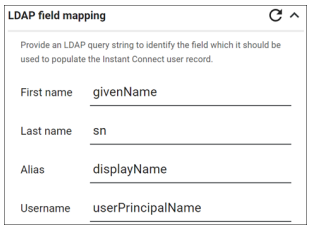
3.2 AD Explorer: Find a search path

1. Within AD Explorer, navigate to a folder or object in the directory tree.
2. Right click on it.
3. From the resulting menu, select ‘Properties’.
4. From the resulting ‘Properties’ screen, select the ‘Attribute Editor’ tab.
5. Scroll down the ‘Attributes’ list to the `distinguishedName` attribute.
6. The `distinguishedName` *value* provides the path which can be used to build the search filter.



4 LDAP field mapping

These fields comprise a list of LDAP attributes which must be mapped to the ICE Server user profile. While other LDAP attributes (either default, or custom) may be used for mapping, the typical values provided below are the most common ones and should work on most installations.



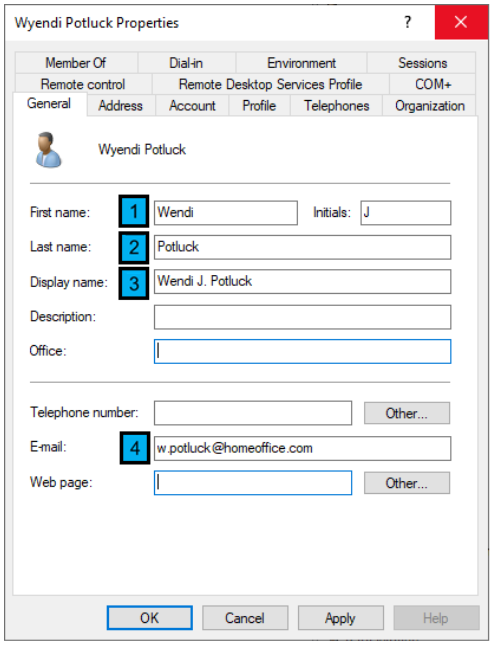
Object	Description	Typical Value
First name	The AD attribute for user first name.	`givenName`
Last name	The AD attribute for user last name.	`sn`

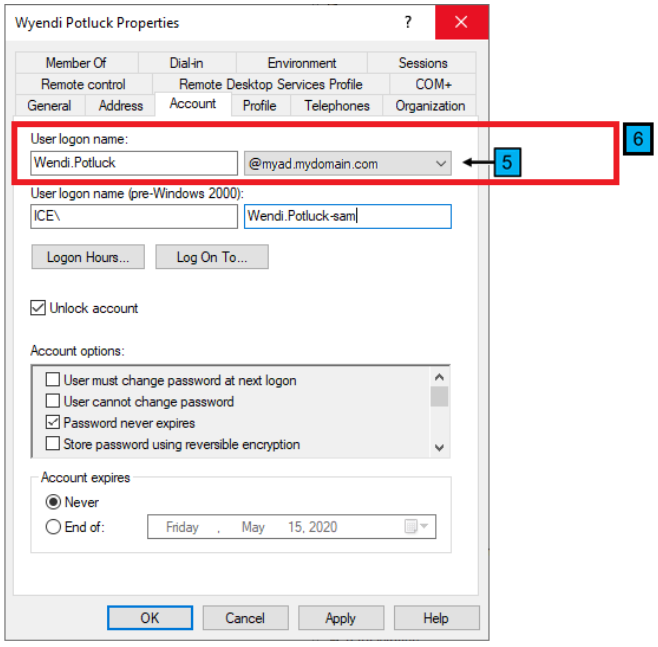
Object	Description	Typical Value
Alias	The AD attribute to be displayed in the ICE Server user profile. In AD LDS, `displayName` defaults to `givenName` + `initials` + `.` + `sn`.	`displayName`
Username	The AD attribute for user email address, which is used for login.	`userPrincipalName`

4.1 Field mapping

The screencaps below are presented as examples illustrating how LDAP fields are displayed in AD:

1. `givenName`
2. `sn`
3. `displayName`
4. `mail`
5. AD domain name
6. `userPrincipalName`

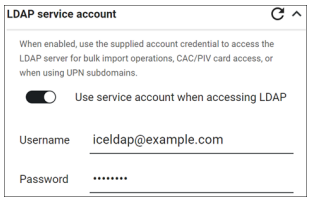




5 LDAP service account

This panel allows an admin to specify a 'service account' for ICE Server to use for accessing the LDAP or Active Directory systems. This feature is disabled (i.e., it has no affect) unless ICE Server is configured to authenticate users with LDAP. The primary uses for this feature are:

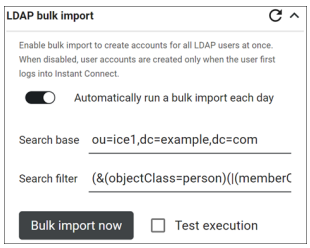
- For LDAP bulk import.
- For utilizing the 'Allow login with PIV card' feature and managing PIV identities via LDAP. ICE Server uses the service account specified here to access the LDAP directory and look for an account matching the identity of the PIV user (where the User Principal Name (UPN) is constructed as: `lastname.firsname.middlename.EDIPI@mil`). If such an account is found, the PIV user is logged in, otherwise their login is rejected.
- An LDAP system is configured such that a user does not have read access to their own LDAP record (an uncommon configuration). ICE Server uses the service account specified here to populate user information, e.g., first name, last name, email address.



Object	Description
Use service account when accessing LDAP	Toggle on to enable the service account feature.
Username	The username for the service account on the LDAP server.
Password	The password for the service account on the LDAP server.

6 LDAP bulk import

> **Note:** Requires an LDAP service account be configured.
>
> **Note:** If a user is deleted from AD, they will still appear in ICE Desktop, but their login no longer works.



Object	Description
Automatically run a bulk import each day	Toggle on to enable a daily automatic import of LDAP users.
Search base	Defines the starting point for the search in the Active Directory tree. Search base ***must*** be the top node of the AD tree for ICE Server users. All AD users who will be ICE Server users ***must*** belong to the same LDAP directory tree or sub-tree.
Search filter	Defines the LDAP query for searching users based on mapping of username to a particular LDAP attribute: `objectClass=person`.
Bulk import now	Select this button to perform an import of LDAP users.
Test execution	Allows a test import of LDAP users, so that search base and search filter can be adjusted, if necessary.

Bulk import search filters target `objectClass=person`, instead of `userPrincipalName=%s`, otherwise they are structured the same as described in the 'Search filters' section above.

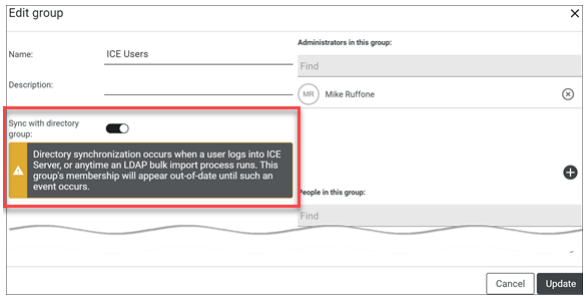
- Bulk import: `(&(objectClass=person)(memberOf=cn=ice3 Users,ou=ice2,ou=ice1,dc=example,dc=com))`
- Non-bulk: `(&(userPrincipalName=%s)(memberOf=cn=ice3 Users,ou=ice2,ou=ice1,dc=example,dc=com))`

7 Groups

> **Note:** If a user is deleted from AD, they will still appear in ICE Desktop, but their login no longer works.

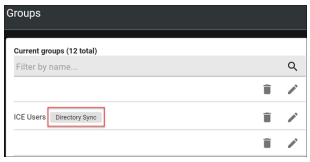
Group memberships can be synchronized from AD to ICE Desktop. One benefit is that users added to an AD group, once a data synch occurs, are also added to the corresponding ICE Desktop group *and* inherit any of that group's specifications, e.g., channel memberships.

For AD groups and ICE Desktop groups to remain in synch, data ***must*** flow from AD to ICE Desktop and ***not*** the other way. First create the AD group, then create the ICE Desktop group in the usual way, but with the following requirements:



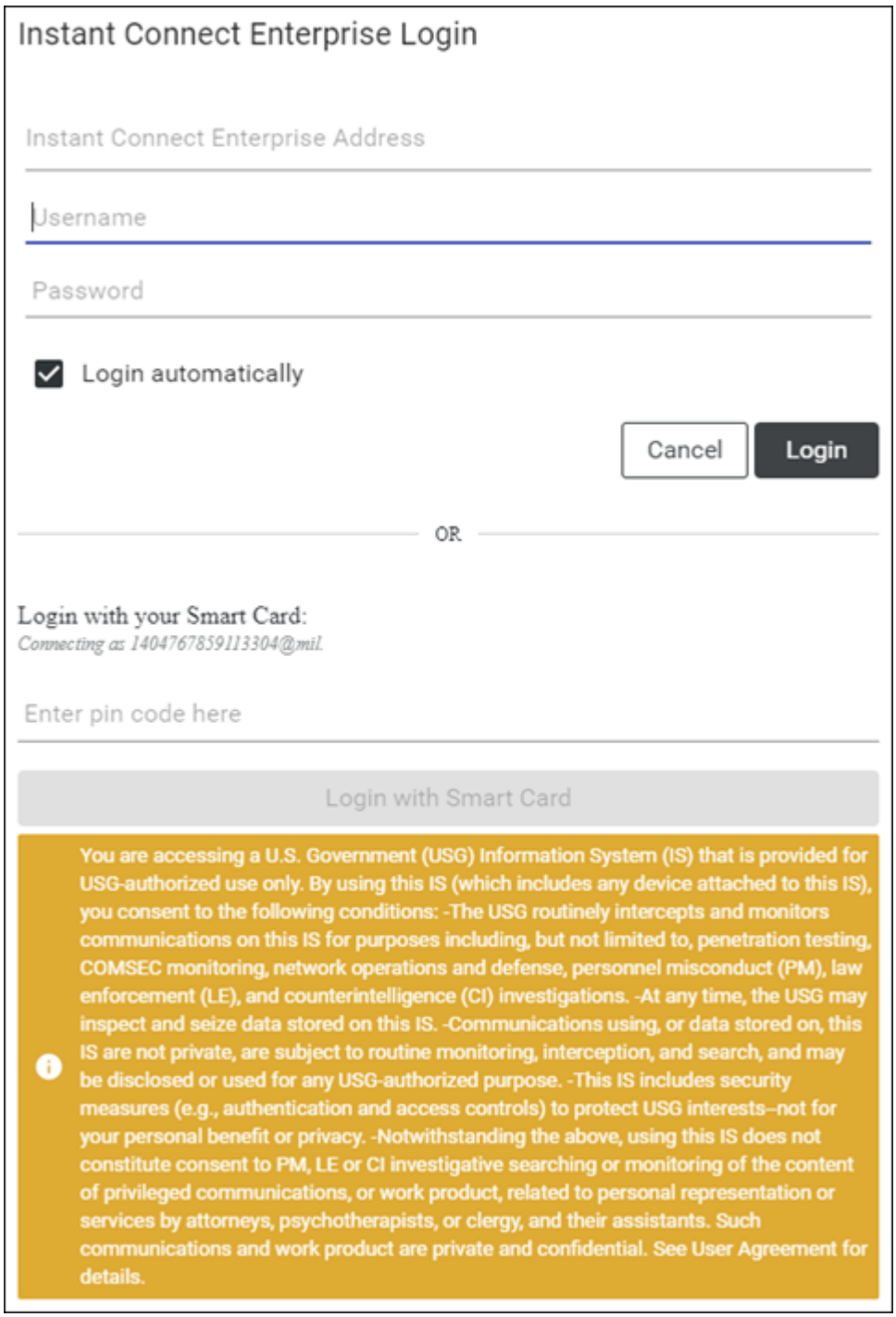
Object	Description
Name	The group name entered here must ***exactly*** match the corresponding AD group name.
Sync with directory group	***Must*** be toggled on.

These groups display in ICE Desktop with a 'Directory Sync' label. This is a visual reminder to ***not*** edit that group's name or members via ICE Desktop, as that ***must*** be done via AD.

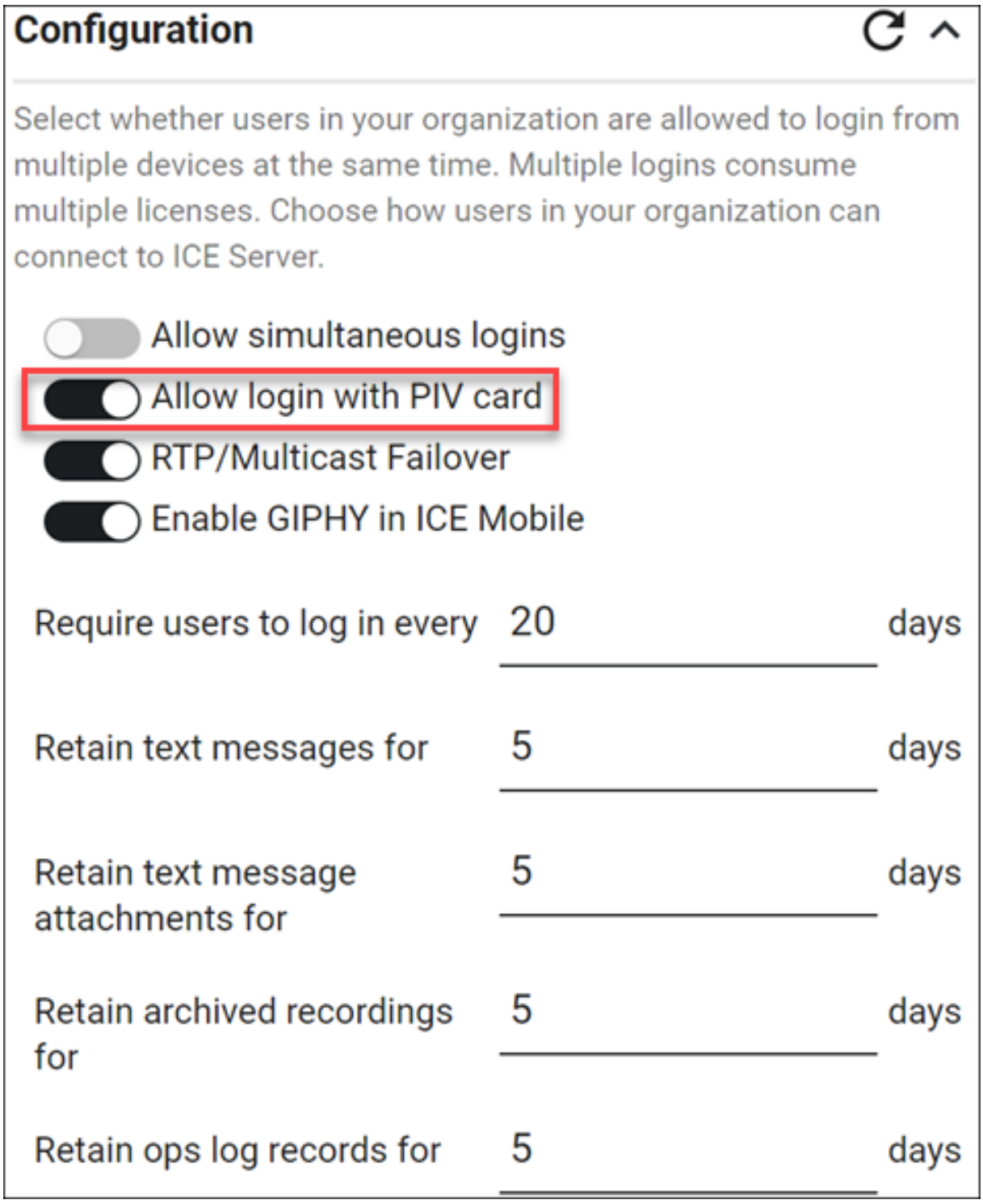


8 Login with PIV smart card

On inserting a PIV smart card into an available smart card reader, the ICE Server desktop client login displays an additional 'Login with your Smart Card' option. This option is not visible if a PIV card is absent.



To enable this feature, go to Settings > Organization > Configuration and toggle on ‘Allow login with PIV card’.



This feature requires the following:

1. A smart card reader attached to the relevant computer.

2. 'Login with PIV smart card' enabled via 'Organization' screen, otherwise attempts to read the PIV smart card will fail.
3. The user's ICE Server username must be `CommonName@OrganizationalUnit`
    - `CommonName` and `OrganizationalUnit` correspond with the fields of the same name on the user's PIV profile, which is read by the smart card reader.
    - Multiple values for `OrganizationalUnit` are concatenated for the ICE Server username.
4. The smart card reader must be able to read the inserted PIV smart card.

To login with a PIV smart card:

> **Note:** The 'Login automatically' function has no affect on login with a PIV smart card.

1. Enter server address.
2. Insert smart card. The 'Login with your Smart Card' option will display.
3. Select 'Login with Smart Card'.

9 Configure CA certificates for LDAP

Please refer to the *ICE Server Installation Guide* for instructions on accessing the 'ICE OS Configuration Wizard' and configuring the CA certificates used for LDAP. By default, the system certificates are also used for LDAP, but that can be disabled, allowing for LDAP-specific CA certificates to be configured, too (see the 'TLS Certs' screen of the configuration wizard).