



# **Configure name mappings**

## **ONTAP 9**

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# Configure name mappings

## Configure name mappings overview

ONTAP uses name mapping to map CIFS identities to UNIX identities, Kerberos identities to UNIX identities, and UNIX identities to CIFS identities. It needs this information to obtain user credentials and provide proper file access regardless of whether they are connecting from an NFS client or a CIFS client.

There are two exceptions where you do not have to use name mapping:

- You configure a pure UNIX environment and do not plan to use CIFS access or NTFS security style on volumes.
- You configure the default user to be used instead.

In this scenario, name mapping is not required because instead of mapping every individual client credential all client credentials are mapped to the same default user.

Note that you can use name mapping only for users, not for groups.

However, you can map a group of individual users to a specific user. For example, you can map all AD users that start or end with the word SALES to a specific UNIX user and to the user's UID.

## How name mapping works

When ONTAP has to map credentials for a user, it first checks the local name mapping database and LDAP server for an existing mapping. Whether it checks one or both and in which order is determined by the name service configuration of the SVM.

- For Windows to UNIX mapping

If no mapping is found, ONTAP checks whether the lowercase Windows user name is a valid user name in the UNIX domain. If this does not work, it uses the default UNIX user provided that it is configured. If the default UNIX user is not configured and ONTAP cannot obtain a mapping this way either, mapping fails and an error is returned.

- For UNIX to Windows mapping

If no mapping is found, ONTAP tries to find a Windows account that matches the UNIX name in the SMB domain. If this does not work, it uses the default SMB user, provided that it is configured. If the default CIFS user is not configured and ONTAP cannot obtain a mapping this way either, mapping fails and an error is returned.

Machine accounts are mapped to the specified default UNIX user by default. If no default UNIX user is specified, machine account mappings fail.

- Beginning with ONTAP 9.5, you can map machine accounts to users other than the default UNIX user.
- In ONTAP 9.4 and earlier, you cannot map machine accounts to other users.

Even if name mappings for machine accounts are defined, the mappings are ignored.

# Multidomain searches for UNIX user to Windows user name mappings

ONTAP supports multidomain searches when mapping UNIX users to Windows users. All discovered trusted domains are searched for matches to the replacement pattern until a matching result is returned. Alternatively, you can configure a list of preferred trusted domains, which is used instead of the discovered trusted domain list and is searched in order until a matching result is returned.

## How domain trusts affect UNIX user to Windows user name mapping searches

To understand how multidomain user name mapping works, you must understand how domain trusts work with ONTAP. Active Directory trust relationships with the CIFS server's home domain can be a bidirectional trust or can be one of two types of unidirectional trusts, either an inbound trust or an outbound trust. The home domain is the domain to which the CIFS server on the SVM belongs.

- *Bidirectional trust*

With bidirectional trusts, both domains trust each other. If the CIFS server's home domain has a bidirectional trust with another domain, the home domain can authenticate and authorize a user belonging to the trusted domain and vice versa.

UNIX user to Windows user name mapping searches can be performed only on domains with bidirectional trusts between the home domain and the other domain.

- *Outbound trust*

With an outbound trust, the home domain trusts the other domain. In this case, the home domain can authenticate and authorize a user belonging to the outbound trusted domain.

A domain with an outbound trust with the home domain is *not* searched when performing UNIX user to Windows user name mapping searches.

- *Inbound trust*

With an inbound trust, the other domain trusts the CIFS server's home domain. In this case, the home domain cannot authenticate or authorize a user belonging to the inbound trusted domain.

A domain with an inbound trust with the home domain is *not* searched when performing UNIX user to Windows user name mapping searches.

## How wildcards (\*) are used to configure multidomain searches for name mapping

Multidomain name mapping searches are facilitated by the use of wildcards in the domain section of the Windows user name. The following table illustrates how to use wildcards in the domain part of a name mapping entry to enable multidomain searches:

Pattern	Replacement	Result
root	*\\administrator	The UNIX user “root” is mapped to the user named “administrator”. All trusted domains are searched in order until the first matching user named “administrator” is found.
*	*\\*	<p>Valid UNIX users are mapped to the corresponding Windows users. All trusted domains are searched in order until the first matching user with that name is found.</p> <div>  <p>The pattern *\\* is only valid for name mapping from UNIX to Windows, not the other way around.</p> </div>

## How multidomain name searches are performed

You can choose one of two methods for determining the list of trusted domains used for multidomain name searches:

- Use the automatically discovered bidirectional trust list compiled by ONTAP
- Use the preferred trusted domain list that you compile

If a UNIX user is mapped to a Windows user with a wildcard used for the domain section of the user name, the Windows user is looked up in all the trusted domains as follows:

- If a preferred trusted-domain list is configured, the mapped Windows user is looked up in this search list only, in order.
- If a preferred list of trusted domains is not configured, then the Windows user is looked up in all the bidirectional trusted domains of the home domain.
- If there are no bidirectionally trusted domains for the home domain, the user is looked up in the home domain.

If a UNIX user is mapped to a Windows user without a domain section in the user name, the Windows user is looked up in the home domain.

## Name mapping conversion rules

An ONTAP system keeps a set of conversion rules for each SVM. Each rule consists of two pieces: a *pattern* and a *replacement*. Conversions start at the beginning of the appropriate list and perform a substitution based on the first matching rule. The pattern is a UNIX-style regular expression. The replacement is a string containing escape sequences representing subexpressions from the pattern, as in the UNIX `sed` program.

# Create a name mapping

You can use the `vserver name-mapping create` command to create a name mapping. You use name mappings to enable Windows users to access UNIX security style volumes and the reverse.

## About this task

For each SVM, ONTAP supports up to 12,500 name mappings for each direction.

## Step

1. Create a name mapping: `vserver name-mapping create -vserver vserver_name -direction {krb-unix|win-unix|unix-win} -position integer -pattern text -replacement text`



The `-pattern` and `-replacement` statements can be formulated as regular expressions. You can also use the `-replacement` statement to explicitly deny a mapping to the user by using the null replacement string " " (the space character). See the `vserver name-mapping create` man page for details.

When Windows-to-UNIX mappings are created, any SMB clients that have open connections to the ONTAP system at the time the new mappings are created must log out and log back in to see the new mappings.

## Examples

The following command creates a name mapping on the SVM named `vs1`. The mapping is a mapping from UNIX to Windows at position 1 in the priority list. The mapping maps the UNIX user `johnd` to the Windows user `ENG\JohnDoe`.

```
vs1::> vserver name-mapping create -vserver vs1 -direction unix-win
-position 1 -pattern johnd
-replacement "ENG\\JohnDoe"
```

The following command creates another name mapping on the SVM named `vs1`. The mapping is a mapping from Windows to UNIX at position 1 in the priority list. Here the pattern and replacement include regular expressions. The mapping maps every CIFS user in the domain `ENG` to users in the LDAP domain associated with the SVM.

```
vs1::> vserver name-mapping create -vserver vs1 -direction win-unix
-position 1 -pattern "ENG\\(.+)"
-replacement "\\1"
```

The following command creates another name mapping on the SVM named `vs1`. Here the pattern includes "\$" as an element in the Windows user name that must be escaped. The mapping maps the windows user `ENG\john$ops` to UNIX user `john_ops`.

```
vs1::> vserver name-mapping create -direction win-unix -position 1
-pattern ENG\\john\${ops}
-replacement john_ops
```

## Configure the default user

You can configure a default user to use if all other mapping attempts fail for a user, or if you do not want to map individual users between UNIX and Windows. Alternatively, if you want authentication of non-mapped users to fail, you should not configure a default user.

### About this task

For CIFS authentication, if you do not want to map each Windows user to an individual UNIX user, you can instead specify a default UNIX user.

For NFS authentication, if you do not want to map each UNIX user to an individual Windows user, you can instead specify a default Windows user.

### Steps

1. Perform one of the following actions:

If you want to...	Enter the following command...
Configure the default UNIX user	<code>vserver cifs options modify -default -unix-user <i>user_name</i></code>
Configure the default Windows user	<code>vserver nfs modify -default-win-user <i>user_name</i></code>

## Commands for managing name mappings

There are specific ONTAP commands for managing name mappings.

If you want to...	Use this command...
Create a name mapping	<code>vserver name-mapping create</code>
Insert a name mapping at a specific position	<code>vserver name-mapping insert</code>
Display name mappings	<code>vserver name-mapping show</code>

If you want to...	Use this command...
<div data-bbox="167 258 220 310">i</div> <div data-bbox="280 237 711 331">A swap is not allowed when name-mapping is configured with an ip-qualifier entry.</div>	<pre>vserver name-mapping swap</pre>
Modify a name mapping	<pre>vserver name-mapping modify</pre>
Delete a name mapping	<pre>vserver name-mapping delete</pre>
Validate the correct name mapping	<pre>vserver security file-directory show-effective-permissions -vserver vs1 -win -user-name user1 -path / -share-name sh1</pre>

See the man page for each command for more information.



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