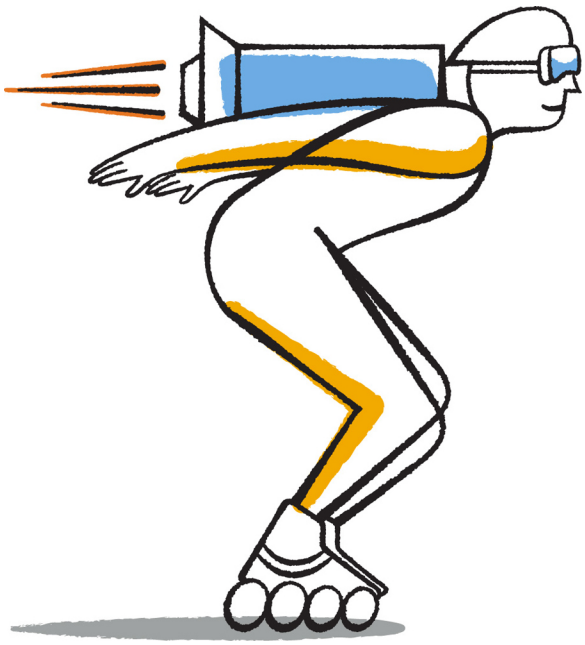
Updated for 8.3.1

Clustered Data ONTAP® 8.3

CIFS and NFS Multiprotocol Configuration Express Guide



NetApp, Inc.
495 East Java Drive
Sunnyvale, CA 94089
U.S.

Telephone: +1 (408) 822-6000
Fax: +1 (408) 822-4501
Support telephone: +1 (888) 463-8277
Web: www.netapp.com
Feedback: doccomments@netapp.com

Part number: 215-09056_B0
June 2015

Contents

Deciding whether to use this guide 4
Multiprotocol configuration workflow 5
Creating an aggregate 5
Deciding where to provision the new volume 6
Creating a basic SVM 7
Adding CIFS and NFS access to an existing SVM 10
Opening the export policy of the SVM root volume 12
Mapping the CIFS server in the DNS server 13
Configuring LDAP 13
Mapping UNIX and Windows user names 16
Creating and configuring a volume 18
Creating a share and setting its permissions 19
Creating an export policy for the volume 20
Verifying CIFS access as a Windows administrator 21
Verifying NFS access from a UNIX administration host 22
Configuring and verifying CIFS and NFS client access 23
Where to find additional information 25
Copyright information 27
Trademark information 28
How to send comments about documentation and receive update notifications 29
Index 30

Deciding whether to use this guide

This guide describes how to quickly set up both CIFS/SMB and NFS access to a new volume on either a new or existing Storage Virtual Machine (SVM).

You should use this guide if you want to configure access to a volume in the following way:

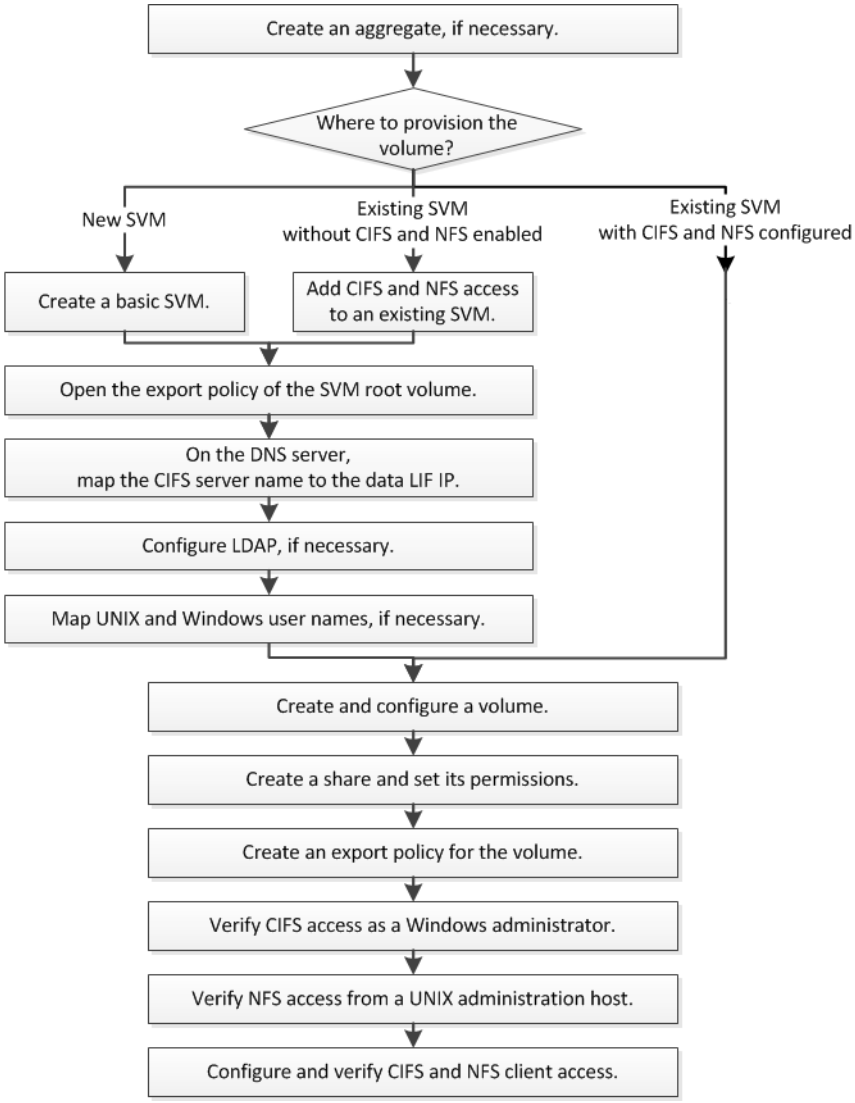
- NFS access will be via NFSv3, not NFSv4 or NFSv4.1.
- You want to use best practices, not explore every available option.
- You do not want to read a lot of conceptual background.
- You want to use OnCommand System Manager, not the Data ONTAP command-line interface or an automated scripting tool.
- You want to create FlexVol volumes, not Infinite Volumes.
- LDAP, if used, is provided by Active Directory.

If this guide is not suitable for your situation, you should see the following documentation instead:

- *Clustered Data ONTAP 8.3 File Access Management Guide for NFS*
- *Clustered Data ONTAP 8.3 File Access Management Guide for CIFS*
- *Clustered Data ONTAP 8.3 Network Management Guide*
- *NetApp Technical Report 4067: Clustered Data ONTAP Best Practice and NFS Implementation Guide*
- *NetApp Technical Report 4073: Secure Unified Authentication with NetApp Storage Systems: Kerberos, NFSv4, and LDAP for User Authentication over NFS (with a Focus on Clustered Data ONTAP)*
- *NetApp Technical Report 3580: NFSv4 Enhancements and Best Practices Guide: Data ONTAP Implementation*
- *NetApp Technical Report 4379: Name Services Best Practice Guide Clustered Data ONTAP*
- *NetApp Documentation: OnCommand Workflow Automation (current releases)*
  OnCommand Workflow Automation enables you to run prepackaged workflows that automate management tasks such as the workflows described in Express Guides.

Multiprotocol configuration workflow

Configuring both CIFS/SMB and NFS involves optionally creating an aggregate; optionally creating a new SVM or configuring an existing one; creating a volume, share, and export; and verifying access from UNIX and Windows administration hosts. You can then open access to CIFS and NFS clients.



Creating an aggregate

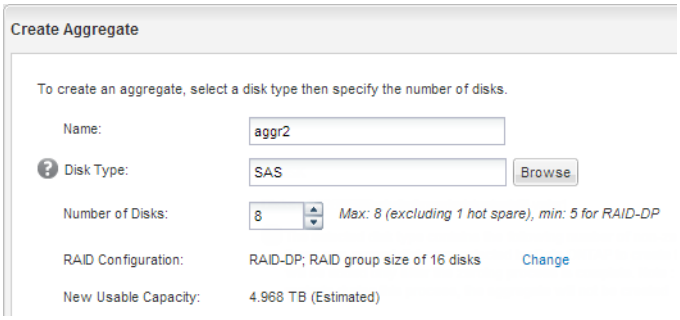
If you do not want to use an existing aggregate, you can create a new aggregate to provide physical storage to the volume you are provisioning.

About this task

If you have an existing aggregate that you want to use for the new volume, you can skip this procedure.

Steps

1. Enter the URL **https://*IP-address-of-cluster-management-LIF*** in a web browser and log in to System Manager using your cluster administrator credential.
2. In the navigation pane, expand the **Cluster** hierarchy and click **Storage > Aggregates**.
3. Click **Create**.
4. Follow the instructions on the screen to create the aggregate using the default RAID-DP configuration, and then click **Create**.



Result

The aggregate is created with the specified configuration and added to the list of aggregates in the Aggregates window.

Deciding where to provision the new volume

Before you create a new multiprotocol volume, you must decide whether to place the volume in an existing Storage Virtual Machine (SVM), and, if so, how much configuration the SVM requires. This decision determines your workflow.

Choices

- If you want a new SVM, see *Creating a basic SVM* on page 7.

  You must choose this option if CIFS and NFS are not already enabled on an existing SVM.

- If you want to provision a volume on an existing SVM that has both CIFS and NFS enabled but not configured, see *Adding CIFS and NFS access to an existing SVM* on page 10 and all subsequent steps.

  You should choose this option if you created the SVM for SAN access by using the relevant Express Guide.

- If you want to provision a volume on an existing SVM that is fully configured for CIFS and NFS multiprotocol access, you can skip several steps and go directly to *Creating and configuring a volume* on page 18.

Creating a basic SVM

You can use a wizard that guides you through the process of creating a new SVM, configuring DNS, creating a data LIF, configuring a CIFS server, enabling NFS, and optionally configuring NIS.

Before you begin

- Your network must be configured and the relevant physical ports must be connected to the network.
- You must know which of the following networking components the SVM will use:
  - IPspace, if the network has more than one IPspace
    You cannot change the IPspace after the SVM is created.
  - Node and the specific port on that node where the data logical interface (LIF) will be created
  - The subnet from which the data LIF's IP address will be provisioned, and optionally the specific IP address you want to assign to the data LIF
  - Active Directory (AD) domain that this SVM will join, along with the credentials required to add the SVM to it
  - NIS information, if your site uses NIS for name services or name mapping
- The subnet must be routable to all external servers required for services such as NIS, LDAP, AD, and DNS.
- Any external firewalls must be appropriately configured to allow access to network services.
- The time on the AD domain controllers, clients, and SVM must be synchronized to within five minutes of each other.

About this task

When you are creating an SVM for multiprotocol access, you should not use the provisioning sections of the Storage Virtual Machine (SVM) Setup window, which creates two volumes—not a single volume with multiprotocol access. You can provision the volume later in the workflow.

Steps

1. Expand the **Storage Virtual Machines** hierarchy in the left navigation pane, and then click **Create**.
2. In the **Storage Virtual Machine (SVM) Setup** window, create the SVM:
   a. Specify a unique name for the SVM.

      The name must either be a fully qualified domain name (FQDN) or follow another convention that ensures unique names across a cluster.

   b. Select the IPspace to which the SVM will belong.

      If the cluster does not use multiple IPspaces, the Default IPspace is used.

   c. Select all the protocols that you have licenses for and that you will eventually use on the SVM, even if you do not want to configure all the protocols immediately.

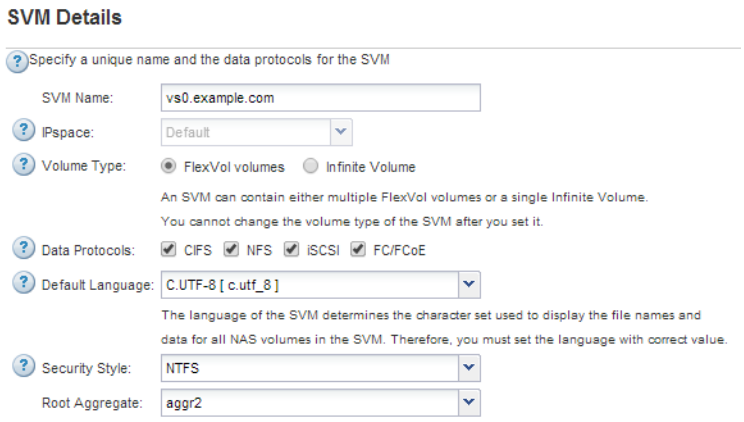
   d. Keep the default language setting, C.UTF-8.

   e. Optional: Ensure that the security style is set to your preference.

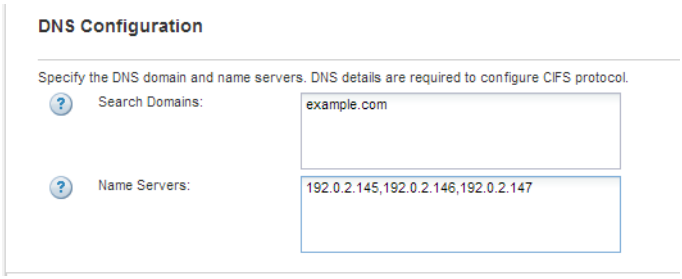
      Selecting the CIFS protocol sets the security style to NTFS by default.

f. Optional: Select the root aggregate to contain the SVM root volume.

The aggregate that you select for the root volume does not determine the location of the data volume. The aggregate for the data volume is selected separately in a later step.



g. Optional: In the **DNS Configuration** area, ensure that the default DNS search domain and name servers are the ones that you want to use for this SVM.



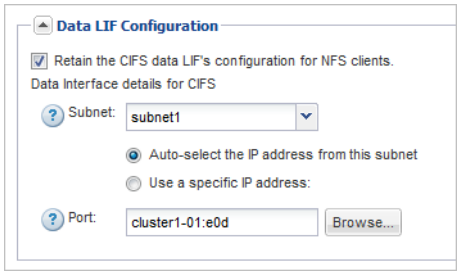
h. Click **Submit & Continue**.

The SVM is created, but protocols are not yet configured.

3. In the **Data LIF Configuration** section of the **Configure CIFS/NFS protocol** page, specify the details of the LIF that clients will use to access data:

a. Assign an IP address to the LIF automatically from a subnet you specify or manually enter the address.

b. Click **Browse** and select a node and port that will be associated with the LIF.



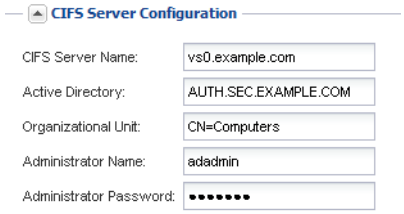
4. In the **CIFS Server Configuration** section, define the CIFS server and configure it to access the AD domain:

a. Specify a name for the CIFS server that is unique in the AD domain.

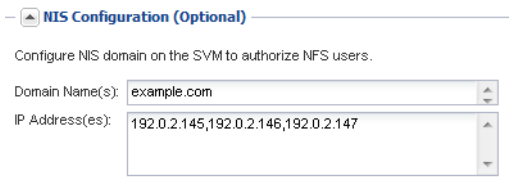
b. Specify the FQDN of the AD domain that the CIFS server can join.

c. If you want to associate an organizational unit (OU) within the AD domain other than CN=Computers, enter the OU.

d. Specify the name and password of an administrative account that has sufficient privileges to add the CIFS server to the OU.



5. Skip the **Provision a volume for CIFS Storage** area, because it provisions a volume for only CIFS access—not for multiprotocol access.
6. If the **NIS Configuration** area is collapsed, expand it.
7. If your site uses NIS for name services or name mapping, specify the domain and IP addresses of the NIS servers.



8. Skip the **Provision a volume for NFS Storage** area, because it provisions a volume for NFS access only—not for multiprotocol access.
9. Click **Submit & Continue**.

   The following objects are created:

   - A data LIF named after the SVM with the suffix "_cifs_nfs_lif1"
   - A CIFS server that is part of the AD domain
   - An NFS server
10. For all other protocol configuration pages that are displayed, click **Skip** and configure the protocol later.
11. When the **SVM Administration** page is displayed, configure or defer configuring a separate administrator for this SVM:

    - Click **Skip** and configure an administrator later if required.
    - Enter the requested information and then click **Submit & Continue**.
12. Review the **Summary** page, record any information you might require later and then click **OK**.

The DNS administrator needs to know the CIFS server name and the IP address of the data LIF. Windows clients need to know the name of the CIFS server. NFS clients need to know the IP address of the data LIF.

Result

A new SVM is created that has a CIFS server and an NFS server accessible through the same data LIF.

After you finish

You must now open the export policy of the SVM root volume.

Related tasks

Opening the export policy of the SVM root volume on page 12

Adding CIFS and NFS access to an existing SVM

Adding both CIFS/SMB and NFS access to an existing SVM involves creating a data LIF, configuring a CIFS server, enabling NFS, and optionally configuring NIS.

Before you begin

- You must know which of the following networking components the SVM will use:
  - Node and the specific port on that node where the data logical interface (LIF) will be created
  - The subnet from which the data LIF's IP address will be provisioned, and optionally the specific IP address you want to assign to the data LIF
  - Active Directory (AD) domain that this SVM will join, along with the credentials required to add the SVM to it
  - NIS information, if your site uses NIS for name services or name mapping
- Any external firewalls must be appropriately configured to allow access to network services.
- The time on the AD domain controllers, clients, and SVM must be synchronized within five minutes of each other.
- The CIFS and NFS protocols must be allowed on the SVM.
  This is the case if you created the SVM while following another Express Guide to configure a SAN protocol.

About this task

The order in which you configure CIFS and NFS affects the dialog boxes that are displayed. In this procedure, you must configure CIFS first and NFS second.

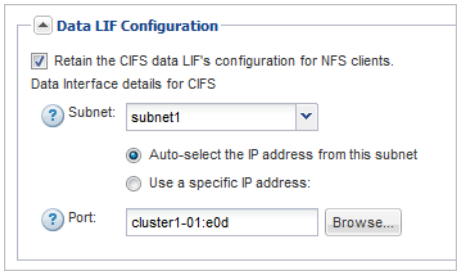
Steps

1. Navigate to the area where you can configure the protocols of the SVM:
   a. In the navigation pane, expand the **Storage Virtual Machines** hierarchy and select the cluster.
   b. In the list of SVMs, select the SVM that you want to configure.
   c. In the **Details** pane, next to **Protocols**, click **CIFS**.

2. In the **Data LIF Configuration** section of the **Configure CIFS protocol** dialog box, create a data LIF for the SVM:

   a. Assign an IP address to the LIF automatically from a subnet you specify or manually enter the address.

   b. Click **Browse** and select a node and port that will be associated with the LIF.



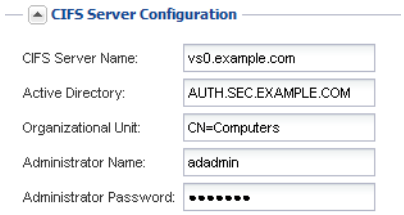
3. In the **CIFS Server Configuration** section, define the CIFS server and configure it to access the AD domain:

   a. Specify a name for the CIFS server that is unique in the AD domain.

   b. Specify the FQDN of the AD domain that the CIFS server can join.

   c. If you want to associate an organizational unit (OU) within the AD domain other than CN=Computers, enter the OU.

   d. Specify the name and password of an administrative account that has sufficient privileges to add the CIFS server to the OU.

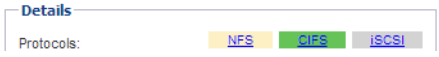


4. Skip the **Provision a volume for CIFS Storage** area, because it provisions a volume for only CIFS access—not for multiprotocol access.

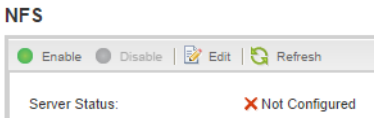
5. Click **Submit & Close**, and then click **OK**.

6. Enable NFS:

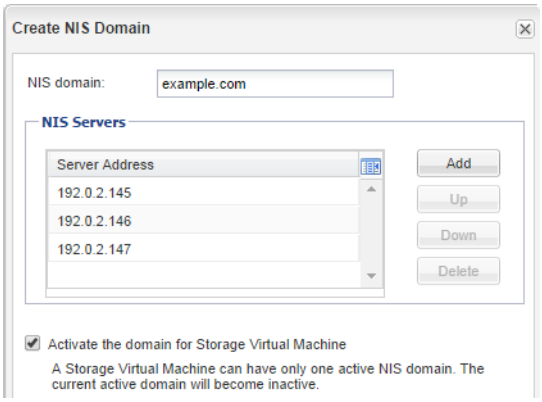
   a. In the **Details** pane, next to **Protocols**, click **NFS**.



   b. In the **NFS** window, click **Enable**.



7. If your site uses NIS for name services or name mapping, configure NIS:
   a. In the navigation pane, select **Configuration > Services > NIS**.
   b. In the **NIS** window, click **Create**.
   c. Specify the domain of the NIS servers.
   d. Add the IP addresses of the NIS servers.
   e. Select **Activate the domain for Storage Virtual Machine**, and then click **Create**.



After you finish

You must now open the export policy of the SVM root volume.

Opening the export policy of the SVM root volume

You must add a rule to the default export policy to allow all clients access through NFSv3. Without such a rule, all NFS clients are denied access to the Storage Virtual Machine (SVM) and its volumes.

About this task

You should open all NFS access in the default export policy, and later restrict access to individual volumes by creating custom export policies for individual volumes.

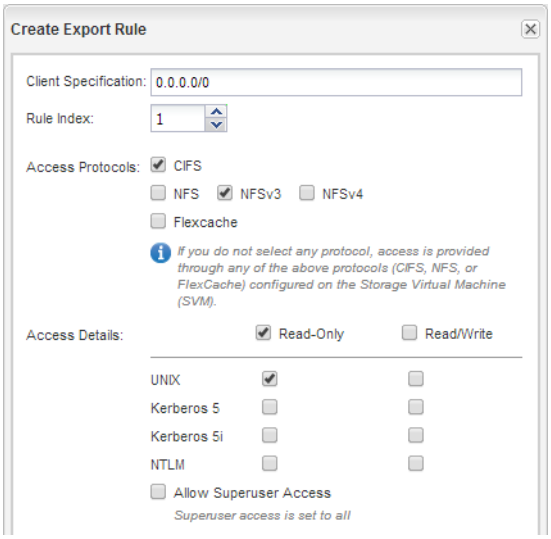
Steps

1. In the navigation pane, select the SVM and click **Policies > Export Policies**.
2. Select the export policy named **default**, which is applied to the SVM root volume.
3. In the lower pane, click **Add**.
4. In the **Create Export Rule** dialog box, create a rule that opens access to all clients for NFS clients:
   a. In the **Client Specification** field, enter **`0.0.0.0/0`** so that the rule applies to all clients.
   b. Retain the default value as **1** for the rule index.

c. Select **NFSv3**.

d. Clear all the check boxes except the **UNIX** check box under **Read-Only**.

e. Click **OK**.



Result

NFSv3 clients can now access any volumes created on the SVM.

Mapping the CIFS server in the DNS server

Your site's DNS server must have an entry pointing the CIFS server name to the IP address of the data LIF so that Windows users can map a drive to the CIFS server name.

Before you begin

You must have administrative access to your site's DNS server. If you do not have administrative access, you must ask the DNS administrator to perform this task.

Step

1. Create forward (A - Address record) and reverse (PTR - Pointer record) lookup entries to map the CIFS server name and the IP address of the data LIF.

Result

After the mapping is propagated across the network, Windows users can map a drive to the CIFS server name.

Configuring LDAP

If you want the SVM to get user information from Active Directory based LDAP, you must create an LDAP client, enable it for the SVM, and give LDAP priority over other sources of user information.

Before you begin

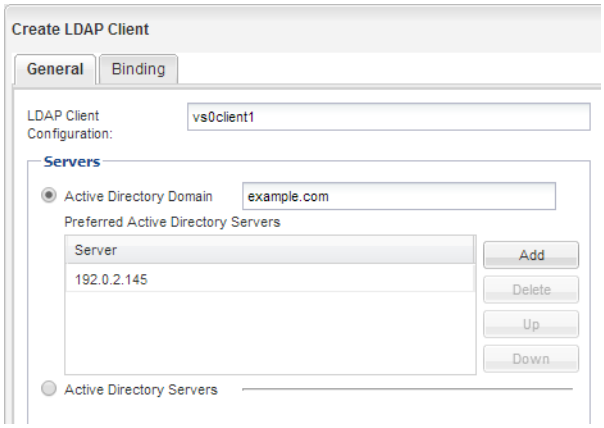
- The LDAP configuration must be using Active Directory (AD).
  If you use another type of LDAP, you must use the command-line interface and other documentation to configure LDAP.

NetApp Technical Report 4073: Secure Unified Authentication with NetApp Storage Systems: Kerberos, NFSv4, and LDAP for User Authentication over NFS (with a Focus on Clustered Data ONTAP)

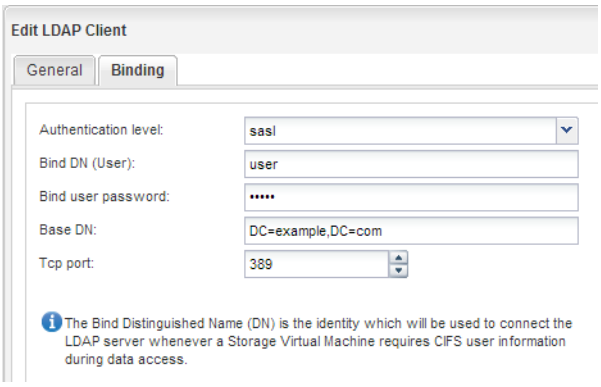
- You must know the AD domain and servers, as well as the following binding information: the authentication level, the Bind user and password, the base DN, and the LDAP port.

Steps

1. Set up an LDAP client for the SVM to use:
   a. In the navigation pane, expand the SVM, and click **Configuration > Services > LDAP Client**.
   b. In the **LDAP Client** window, click **Add**.
   c. In the **General** tab of the **Create LDAP Client** window, type the name of the LDAP client configuration, such as **`vs0client1`**.
   d. Add either the AD domain or the AD servers.



   e. Click **Binding**, and specify the authentication level, the Bind user and password, the base DN, and the port.



   f. Click **Save and Close**.

   A new client is created and available for the SVM to use.

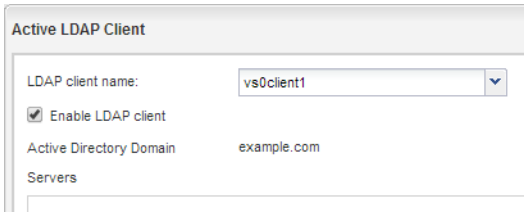
2. Enable the new LDAP client for the SVM:

a. In the navigation pane, click **LDAP Configuration**.

b. Click **Edit**.

c. Ensure that the client you just created is selected in **LDAP client name**.

d. Select **Enable LDAP client**, and click **OK**.



The SVM uses the new LDAP client.

3. Give LDAP priority over other sources of user information, such as NIS and local users and groups:

a. In the navigation pane, select the cluster to display the list of SVMs.

b. In the right window, select the SVM and click **Edit**.

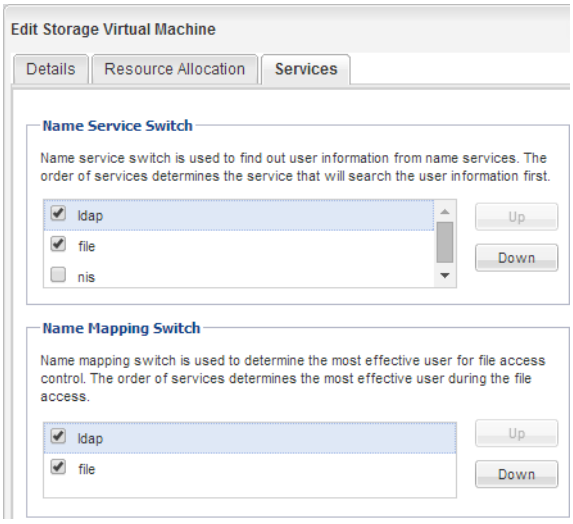
c. Click the **Services** tab.

d. Under **Name Service Switch**, select **LDAP** and move it to the top of the list.

e. Either clear **NIS** or move it further down the order as required.

f. Under **Name Mapping Switch**, select **LDAP** and move it to the top of the list.

g. Click **Save and Close**.



LDAP is the primary source of user information for name services and name mapping on this SVM.

Mapping UNIX and Windows user names

If your site has both Windows and UNIX user accounts, you should use name mapping to ensure that Windows users can access files with UNIX file permissions and to ensure that UNIX users can access files with NTFS file permissions. Name mapping can involve any combination of implicit mapping, conversion rules, and default users.

About this task

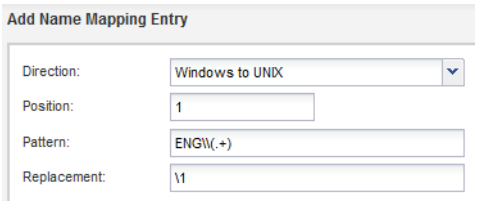
You should use this procedure only if your site has Windows and UNIX user accounts that do not map implicitly, which is when the lowercase version of each Windows user name matches the UNIX user name. This can be done using NIS, LDAP, or local users. If you have two sets of users that do not match, you should configure name mapping.

Steps

1. Decide on a method of name mapping—name mapping conversion rules, default user mappings, or both—by considering the following factors:
   - Conversion rules use regular expressions to convert one user name to another, which is useful if you want to control or track access at an individual level.
     For example, you can map UNIX users to Windows users in a domain, and vice versa.
   - Default users enable you to assign a user name to all users who are not mapped by implicit mappings or name mapping conversion rules.
     Each SVM has a default UNIX user named “pcuser” but does not have a default Windows user.
2. Optional: Create a name mapping that converts UNIX user accounts to Windows user accounts, and vice versa:
   a. In the SVM, select **Configuration > Local Users and Groups > Name Mapping**.
   b. Click **Add**, retain the default **Windows to UNIX** direction, and then create a regular expression that produces a UNIX credential when a Windows user tries to access a file that uses UNIX file permissions.

      #### Example

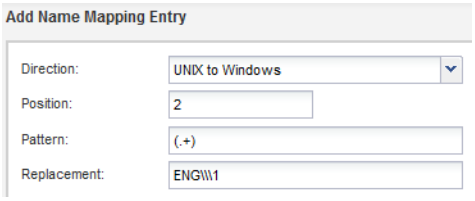
      Use the following entry to convert any Windows user in the ENG domain into a UNIX user of the same name. The pattern **`ENG\\(.+)`** finds any Windows user name with the prefix **`ENG\\`**, and the replacement **`\1`** creates the UNIX version by removing everything except the user name.

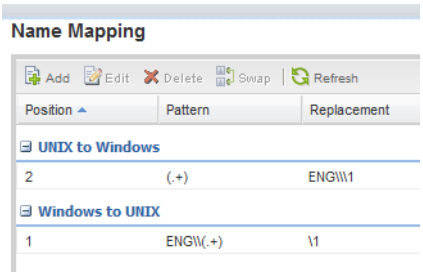
   c. Click **Add**, select the **UNIX to Windows** direction, and then create the corresponding mapping that produces a Windows credential when a UNIX user tries to access a file that has NTFS file permissions.

Example

Use the following entry to convert every UNIX user into a Windows user of the same name in the ENG domain. The pattern **`(.+)`** finds any UNIX name, and the replacement **`ENG\\\1`** creates the Windows version by inserting **`ENG\\`** before the user name.



d. Because the position of each rule determines the order in which the rules are applied, review the result and confirm that the order matches your expectations.



e. Repeat steps a through d to map all of the domains and names on the SVM.

3. Optional: Create a default Windows user:

   a. Create a Windows user account in LDAP, NIS, or the local users of the SVM.

      If you use local users, you can create an account under **Configuration > Local Users and Groups > Windows**.

   b. Set the default Windows user by selecting **Configuration > Protocols > NFS > Edit**, and entering the user name.

Example

You can create a local Windows user named “unixusers” and set it as the default Windows user.

4. Optional: Configure the default UNIX user, if you want a user different from the default value, which is the “pcuser” user.

   a. Create a Windows user account in LDAP, NIS, or the local users of the SVM.

      If you use local users, you can create an account under **Configuration > Local Users and Groups > UNIX**.

   b. Set the default UNIX user by selecting **Configuration > Protocols > CIFS > Options** and entering the user name.

Example

You can create a local UNIX user named “winusers” and set it as the default UNIX user.

After you finish

If you configured default users, when you configure file permissions later in the workflow, you should set permissions for the default Windows user and the default UNIX user.

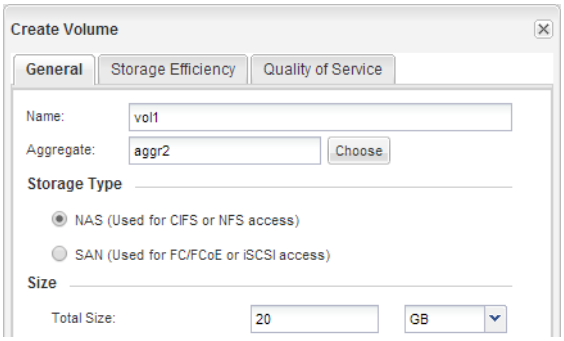
Creating and configuring a volume

You must create a FlexVol volume to contain your data. You can optionally change the volume's default security style, which is inherited from the security style of the root volume. You can also optionally change the volume's default location in the namespace, which is at the root volume of the Storage Virtual Machine (SVM).

Steps

1. In the navigation pane, select the SVM, and click **Storage > Volumes**.
2. Click **Create**.

   The Create Volume dialog box is displayed.
3. If you want to change the default name, which ends in a date and time stamp, specify a new name, such as **`vol1`**.
4. Select an aggregate for the volume.
5. Specify the size of the volume.



6. Click **Create**.

   Any new volume created in System Manager is mounted by default at the root volume using the volume name as the junction name. You use the junction path and the junction name when configuring CIFS shares, and NFS clients use the junction path and the junction name when mounting the volume.
7. Optional: If you do not want the volume to be located at the root of the SVM, modify the place of the new volume in the existing namespace:
   a. Select **Storage > Namespace**.
   b. Select the new volume, click **Unmount**, and then confirm the action in the **Unmount Volume** dialog box.
   c. Click **Mount**.
   d. In the **Mount Volume** dialog box, specify the volume, the name of its junction path, and the junction path on which you want the volume mounted.
   e. Verify the new junction path in the **Namespace** window.

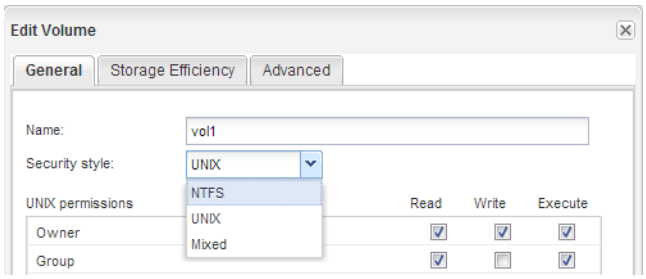
Example

If you want to organize certain volumes under a main volume named “data”, you can move the new volume “vol1” from the root volume to the “data” volume.

8. Review the volume's security style and change it, if necessary:
   a. Click **Storage > Volumes**, select the volume you just created, and click **Edit**.

      The Edit Volume dialog box is displayed, showing the volume's current security style, which is inherited from the security style of the SVM root volume.

   b. Select the security style you prefer, and click **Save and Close**.



Creating a share and setting its permissions

Before Windows users can access a volume, you must create a CIFS share on the volume and restrict access to the share by modifying the access control list (ACL) for the share.

About this task

For testing purposes, you should permit access only to administrators. Later, after you have verified that the volume is accessible, you can permit access to more clients.

Steps

1. In the navigation pane, select the Storage Virtual Machine (SVM).
2. Create a share so that SMB clients can access the volume:
   a. Click **Storage > Shares**.
   b. Click **Create Share**.
   c. In the **Create Share** dialog box, click **Browse**, expand the namespace hierarchy, and select the volume that you created earlier.
   d. Optional: If you want the share name to be different from the volume name, change the share name.
   e. Click **Create**.

The share is created with a default ACL set to Full Control for the Everyone group.

3. Optional: Restrict access to the share by modifying the share ACL:
   a. Select the share, and click **Edit**.
   b. In the **Permissions** tab, select the **Everyone** group, and click **Remove**.
   c. Click **Add**, and enter the name of an administrator group defined in the Windows Active Directory domain that includes the SVM.
   d. With the new administrator group selected, select all permissions for it.
   e. Click **Save and Close**.

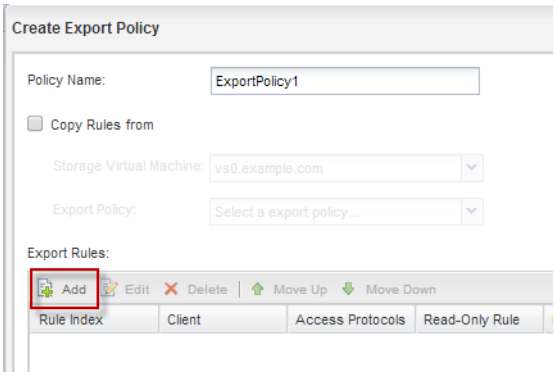
   The updated share access permissions are listed in the Share Access Control pane.

Creating an export policy for the volume

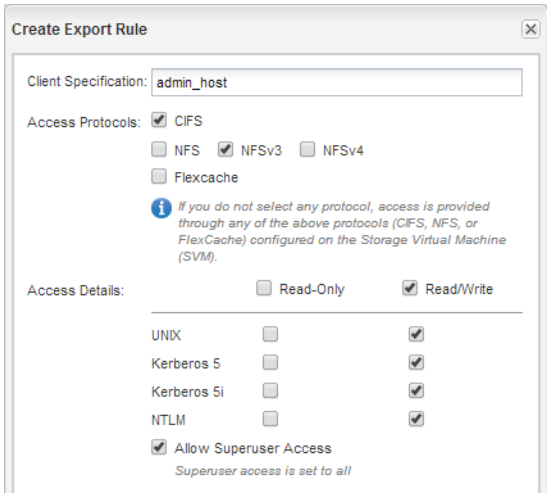
Before any NFS clients can access a volume, you must create an export policy for the volume, add a rule that permits access by an administration host, and apply the new export policy to the volume.

Steps

1. In the navigation pane, expand the SVM and then click **Policies > Export Policies**.
2. Create a new export policy:
   a. In the **Export Policies** window, click **Create**.
   b. In the **Create Export Policy** window, specify a policy name.
   c. Under **Export Rules**, click **Add** to add a rule to the new policy.



3. In the **Create Export Rule** dialog box, create a rule that allows an administrator full access to the export through all protocols:
   a. Specify the IP address or client name, such as admin_host, from which the exported volume will be administered.
   b. Select **CIFS** and **NFSv3**.
   c. Ensure that all **Read/Write** access details are selected, as well as **Allow Superuser Access**.



d. Click **OK** and then click **Create**.

The new export policy is created, along with its new rule.

4. Apply the new export policy to the new volume so that the administrator host can access the volume:

   a. In the left navigation pane, click **Storage** > **Namespace**.

   b. Select the volume and click **Change Export Policy**.

   c. Select the new policy and click **Change**.

Verifying CIFS access as a Windows administrator

You should verify that you have configured CIFS correctly by accessing and writing data to the share as a Windows administrator. You should test access using the IP address and the CIFS server name.

Before you begin

You must have the credentials of a member of the administrators group that you specified earlier when configuring share permissions.

Steps

1. Log on to a Windows client.

   You can use the administrator credentials to log in to the client or wait to enter the credentials when you map a drive in the next step.

2. Test access using the IP address:

   a. In Windows Explorer, map a drive using the IP address of the data LIF for the Storage Virtual Machine (SVM) instead of the CIFS server name.

      #### Example

      If the IP address of the SVM is 10.53.33.1 and the share is named Eng, you should enter the following: **`\\10.53.33.1\Eng`**

   b. On the newly created drive, create a test file and then delete the file.

You have verified write access to the share using the IP address.

3. Test access using the CIFS server name:

   a. In Windows Explorer, map a drive to the share in the following format: ***CIFS_Server_N*ame*Share_Name***

      If the mapping is not successful, it is possible that the DNS mapping has not yet propagated throughout the network. You must test access using the CIFS server name later.

      Example

      If the CIFS server is named vs0.example.com and the share is named Eng, you should enter the following: **\\vs0.example.com\Eng**

   b. On the newly created drive, create a test file and then delete the file.

   You have verified write access to the share using the CIFS server name.

Verifying NFS access from a UNIX administration host

After you configure NFS access to an SVM, you should verify the configuration by logging in to an NFS administration host and reading data from and writing data to the SVM.

Before you begin

- The client system must have an IP address that is allowed by the export rule you specified earlier.
- You must have the login information for the root user.

Steps

1. Log in as the root user to the client system.
2. Enter **cd /mnt/** to change the directory to the mount folder.
3. Create and mount a new folder using the IP address of the SVM:

   a. Enter **mkdir /mnt/*folder*** to create a new folder.

   b. Enter **mount -t nfs -o nfsvers=3,hard *IPAddress*:/*volume_name* /mnt/*folder*** to mount the volume at this new directory.

   c. Enter **cd *folder*** to change the directory to the new folder.

   Example

   The following commands create a folder named test1, mount the vol1 volume at the 192.0.2.130 IP address on the test1 mount folder, and change to the new test1 directory:

   ```
   host# mkdir /mnt/test1
   host# mount -t nfs -o nfsvers=3,hard 192.0.2.130:/vol1 /mnt/test1
   host# cd /mnt/test1
   ```

4. Create a new file, verify that it exists, and write text to it:

   a. Enter **touch *filename*** to create a test file.

   b. Enter **ls -l *filename*** to verify that the file exists.

   c. Enter **cat >*filename***, type some text, and then press Ctrl+D to write text to the test file.

   d. Enter **cat *filename*** to display the content of the test file.

e. Enter **rm *filename*** to remove the test file.

f. Enter **cd ..** to return to the parent directory.

Example

```
host# touch myfile1
host# ls -l myfile1
-rw-r--r-- 1 root root 0 Sep 18 15:58 myfile1
host# cat >myfile1
This text inside the first file
host# cat myfile1
This text inside the first file
host# rm -r myfile1
host# cd ..
```

Result

You have confirmed that you have enabled NFS access to the SVM.

Configuring and verifying CIFS and NFS client access

When you are ready, you can configure client access by setting either UNIX or NTFS file permissions, modifying the share ACL, and adding an export rule. Then you should test that the affected users or groups can access the volume.

Steps

1. Decide which clients and users or groups will be given access to the share.
2. Set file permissions using a method that corresponds to the volume's security style:

If the volume's security style is this...	Do this...
NTFS	**a.** Log in to a Windows client as an administrator who has sufficient administrative rights to manage NTFS permissions. **b.** In Windows Explorer, right-click the drive, and then select **Properties**. **c.** Select the Security tab, and adjust the security settings for the groups and users as required.
UNIX	On a UNIX administration host, use the root user to set UNIX ownership and permissions on the volume.

3. In System Manager, modify the share ACL to give Windows users or groups access to the share.
   a. In the navigation pane, select the Storage Virtual Machine (SVM), and click **Storage > Shares**.
   b. Select the share, and click **Edit**.
   c. Select the **Permissions** tab, and give the users or groups access to the share.
4. In System Manager, add rules to the export policy to permit NFS clients to access the share.
   a. In the navigation pane, select the Storage Virtual Machine (SVM), and click **Policies > Export Policies**.

b. Select the export policy that is applied to the volume.

c. In the **Export Rules** tab, click **Add**, and specify a set of clients.

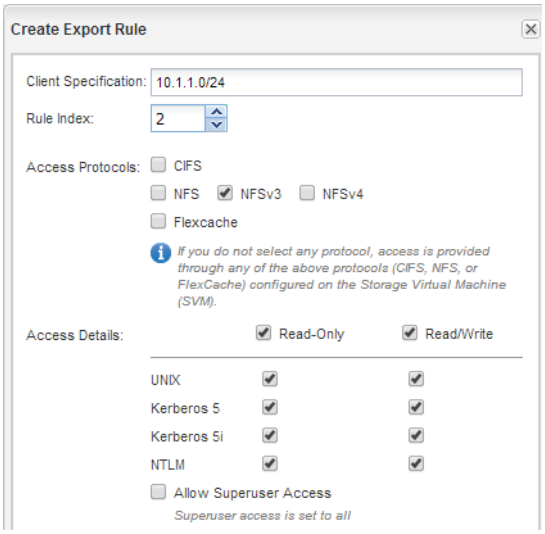
d. Select **2** for the **Rule Index** so that this rule executes after the rule that allows access to the administration host.

e. Select **CIFS** and **NFSv3**.

f. Specify the access details that you want, and click **OK.**

Example

You can give full read/write access to clients by typing the subnet **`10.1.1.0/24`** as the **Client Specification**, and selecting all the access check boxes except **Allow Superuser Access**.



5. On a Windows client, log in as one of the users who now has access to the share and files, and verify that you can access the share and create a file.

6. On a UNIX client, log in as one of the users who now has access to the volume, and verify that you can mount the volume and create a file.

Where to find additional information

After you have successfully tested CIFS and NFS client access, you can perform advanced CIFS and NFS configuration or add SAN access. When protocol access is complete, you should protect the root volume of SVM. There are express guides, comprehensive guides, and technical reports to help you achieve these goals.

CIFS/SMB configuration

You can further configure CIFS access using the following comprehensive guides and technical reports:

- *Clustered Data ONTAP 8.3 File Access Management Guide for CIFS*
  Describes how to configure and manage file access using the CIFS/SMB protocol.
- *NetApp Technical Report 4191: Best Practices Guide for Clustered Data ONTAP 8.2 Windows File Services*
  Provides a brief overview of SMB implementation and other Windows File Services features with recommendations and basic troubleshooting information for Data ONTAP.
- *NetApp Technical Report 3740: SMB 2: Next-Generation CIFS Protocol in Data ONTAP*
  Describes SMB 2 features, configuration details, and its implementation in Data ONTAP.

NFS configuration

You can further configure NFS access using the following comprehensive guides and technical reports:

- *Clustered Data ONTAP 8.3 File Access Management Guide for NFS*
  Describes how to configure and manage file access using the NFS protocol.
- *NetApp Technical Report 4067: Clustered Data ONTAP Best Practice and NFS Implementation Guide*
  Serves as an NFSv3 and NFSv4 operational guide and provides an overview of Data ONTAP operating system with a focus on NFSv4.
- *NetApp Technical Report 4379: Name Services Best Practice Guide Clustered Data ONTAP*
  Explains how to configure LDAP, NIS, DNS, and local file configuration for authentication purposes.
- *NetApp Technical Report 4073: Secure Unified Authentication with NetApp Storage Systems: Kerberos, NFSv4, and LDAP for User Authentication over NFS (with a Focus on Clustered Data ONTAP)*
  Explains how to configure clustered Data ONTAP for use with UNIX-based Kerberos version 5 (krb5) servers for NFS storage authentication and Windows Server Active Directory (AD) as the KDC and Lightweight Directory Access Protocol (LDAP) identity provider.
- *NetApp Technical Report 3580: NFSv4 Enhancements and Best Practices Guide: Data ONTAP Implementation*
  Describes the best practices that should be followed while implementing NFSv4 components on AIX, Linux, or Solaris clients attached to systems running Data ONTAP.

SAN protocol configuration

If you want to provide SAN access to the SVM, you can use any of the FC or iSCSI configuration express guides, which are available for multiple host operating systems.

NetApp Documentation: Clustered Data ONTAP Express Guides

Root volume protection

After configuring protocols on the SVM, you should ensure that its root volume is protected by using the following express guide:

- *Clustered Data ONTAP 8.3 SVM Root Volume Protection Express Guide*
  Describes how to quickly create load-sharing mirrors on every node of a Data ONTAP 8.3 cluster to protect the SVM root volume, which is a NetApp best practice for NAS-enabled SVMs. Also describes how to quickly recover from volume failures or losses by promoting the SVM root volume from a load-sharing mirror.

Copyright information

Copyright © 1994–2015 NetApp, Inc. All rights reserved. Printed in the U.S.

No part of this document covered by copyright may be reproduced in any form or by any means—graphic, electronic, or mechanical, including photocopying, recording, taping, or storage in an electronic retrieval system—without prior written permission of the copyright owner.

Software derived from copyrighted NetApp material is subject to the following license and disclaimer:

THIS SOFTWARE IS PROVIDED BY NETAPP "AS IS" AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE HEREBY DISCLAIMED. IN NO EVENT SHALL NETAPP BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

NetApp reserves the right to change any products described herein at any time, and without notice. NetApp assumes no responsibility or liability arising from the use of products described herein, except as expressly agreed to in writing by NetApp. The use or purchase of this product does not convey a license under any patent rights, trademark rights, or any other intellectual property rights of NetApp.

The product described in this manual may be protected by one or more U.S. patents, foreign patents, or pending applications.

RESTRICTED RIGHTS LEGEND: Use, duplication, or disclosure by the government is subject to restrictions as set forth in subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause at DFARS 252.277-7103 (October 1988) and FAR 52-227-19 (June 1987).

Trademark information

NetApp, the NetApp logo, Go Further, Faster, AltaVault, ASUP, AutoSupport, Campaign Express, Cloud ONTAP, Clustered Data ONTAP, Customer Fitness, Data ONTAP, DataMotion, Fitness, Flash Accel, Flash Cache, Flash Pool, FlashRay, FlexArray, FlexCache, FlexClone, FlexPod, FlexScale, FlexShare, FlexVol, FPolicy, GetSuccessful, LockVault, Manage ONTAP, Mars, MetroCluster, MultiStore, NetApp Insight, OnCommand, ONTAP, ONTAPI, RAID DP, RAID-TEC, SANtricity, SecureShare, Simplicity, Simulate ONTAP, Snap Creator, SnapCenter, SnapCopy, SnapDrive, SnapIntegrator, SnapLock, SnapManager, SnapMirror, SnapMover, SnapProtect, SnapRestore, Snapshot, SnapValidator, SnapVault, StorageGRID, Tech OnTap, Unbound Cloud, and WAFL and other names are trademarks or registered trademarks of NetApp, Inc., in the United States, and/or other countries. All other brands or products are trademarks or registered trademarks of their respective holders and should be treated as such. A current list of NetApp trademarks is available on the web at *http://www.netapp.com/us/legal/netapptmlist.aspx*.

How to send comments about documentation and receive update notifications

You can help us to improve the quality of our documentation by sending us your feedback. You can receive automatic notification when production-level (GA/FCS) documentation is initially released or important changes are made to existing production-level documents.

If you have suggestions for improving this document, send us your comments by email to *doccomments@netapp.com*. To help us direct your comments to the correct division, include in the subject line the product name, version, and operating system.

If you want to be notified automatically when production-level documentation is released or important changes are made to existing production-level documents, follow Twitter account @NetAppDoc.

You can also contact us in the following ways:

- NetApp, Inc., 495 East Java Drive, Sunnyvale, CA 94089 U.S.
- Telephone: +1 (408) 822-6000
- Fax: +1 (408) 822-4501
- Support telephone: +1 (888) 463-8277

Index

A

about this guide
  deciding whether to use *4*
access
  additional documentation *25*
  verifying CIFS access by clients *23*
  verifying NFS access by administrators *22*
  verifying NFS access by clients *23*
  See also permissions
ACLs
  See share ACLs
aggregates
  creating *5*
  selecting for new data volumes during SVM creation *7*
  selecting for new volumes *18*
  selecting for SVM *7*
audience
  for the guide *4*

C

CIFS
  additional documentation *25*
  mapping user names *16*
  requirements for using this guide to set up CIFS and NFS *4*
  setup overview *5*
  verifying access by administrators *21*
CIFS server
  mapping on DNS server *13*
CIFS shares
  See shares
clients
  adding an LDAP configuration *13*
comments
  how to send feedback about documentation *29*
configuring
  LDAP *13*
  multiprotocol access *5*, *10*
creating
  aggregates *5*
  export policies for volumes on existing SVMs *20*
  shares on existing SVMs *19*
  SVMs *7*
  volumes on existing SVMs *18*

D

data LIFs
  creating *7*
DNS server
  mapping CIFS server name *13*
documentation
  additional information about protocol access *25*
  how to receive automatic notification of changes to *29*
  how to send feedback about *29*

E

export policies
  creating for volumes on existing SVMs *20*
  defining for root volumes *12*
  defining for volumes on existing SVMs *20*
exports
  setting UNIX file permissions *23*
  verifying administrator access to *22*
  verifying client access *23*
express guides
  additional documentation *25*
  CIFS/SMB configuration workflow *5*, *10*
  multiprotocol configuration workflow *5*, *10*
  NFS configuration workflow *5*, *10*
  requirements for using this guide *4*

F

feedback
  how to send comments about documentation *29*
file permissions
  setting for NTFS *23*
  setting for UNIX *23*
files
  controlling access to, using NTFS permissions *23*
  controlling access to, using UNIX permissions *23*
FlexVol volumes
  See volumes

I

information
  how to send feedback about improving documentation *29*

L

LDAP
  configuring *13*
LIFs
  mapping the data LIF on the DNS server *13*

M

mapping
  data LIF on the DNS server *13*
  user names on different platforms *16*
multiprotocol access
  additional documentation *25*
  setup overview *5*

N

name mapping

giving LDAP priority *13*
name services
giving LDAP priority *13*
name switches
giving LDAP priority *13*
NFS
additional documentation *25*
mapping user names *16*
requirements for using this guide to set up NFS and CIFS *4*
setup overview *5*
NFS exports
See exports
NTFS
security style, setting *18*
setting file permissions *23*

P

permissions
configuring export policy rules for volumes on existing SVMs *20*
configuring share ACLs on existing SVMs *19*
setting NTFS file permissions *23*
setting UNIX file permissions *23*
policies
adding export rules *23*
creating export, for volumes on existing SVMs *20*
defining export, for volumes on existing SVMs *20*
See also export policies

R

root volumes
opening the export policies of *12*

S

security style
changing *18*
setup
CIFS, overview of *5*, *10*
multiprotocol access, overview of *5*, *10*
NFS, overview of *5*, *10*
share ACLs
defining on existing SVMs *19*
shares
creating on existing SVMs *19*
setting NTFS file permissions *23*
verifying administrator access to *21*
verifying client access *23*
SMB
See CIFS
subnets
choosing *7*
suggestions
how to send feedback about documentation *29*
SVMs
adding LDAP clients *13*
creating export policies for volumes on existing *20*
creating multiprotocol volumes on *18*
creating to support CIFS and NFS *7*

T

technical reports
additional information about file access *25*
testing
See verifying
twitter
how to receive automatic notification of documentation changes *29*

U

UNIX
mapping users to Windows *16*
security style, setting *18*
setting file permissions *23*
users
mapping names to different platforms *16*

V

verifying
CIFS access by administrators *21*
CIFS access by clients *23*
NFS access by administrators *22*
NFS access by clients *23*
volumes
creating export policies for, on existing SVMs *20*
creating on existing SVMs *18*
modifying junction path of *18*

W

Windows
mapping users to UNIX *16*
workflows
multiprotocol configuration *5*, *10*