Create a new NFS-enabled SVM

System Manager Classic

NetApp
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Setting up an NFS-enabled SVM involves creating the new SVM with an NFS volume and export, opening the default export policy of the SVM root volume and then verifying NFS access from a UNIX administration host. You can then configure NFS client access.

Create a new SVM with an NFS volume and export

You can use a wizard that guides you through the process of creating the storage virtual machine (SVM), configuring Domain Name System (DNS), creating a data logical interface (LIF), enabling NFS, optionally configuring NIS, and then creating and exporting a volume.

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:
  - The 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, or optionally the specific IP address you want to assign to the data LIF
  - 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 Network Information Service (NIS), Lightweight Directory Access Protocol (LDAP), Active Directory (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.

Steps

1. Navigate to the **SVMs** window.
2. Click **Create.**
3. In the **Storage Virtual Machine (SVM) Setup** dialog box, 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 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.

      If CIFS access is required eventually, you must select **CIFS** now so that CIFS and NFS clients can share the same data LIF.

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

      If you support international character display in both NFS and SMB/CIFS clients, consider using the **UTF8MB4** language code, which is available beginning with ONTAP 9.5.

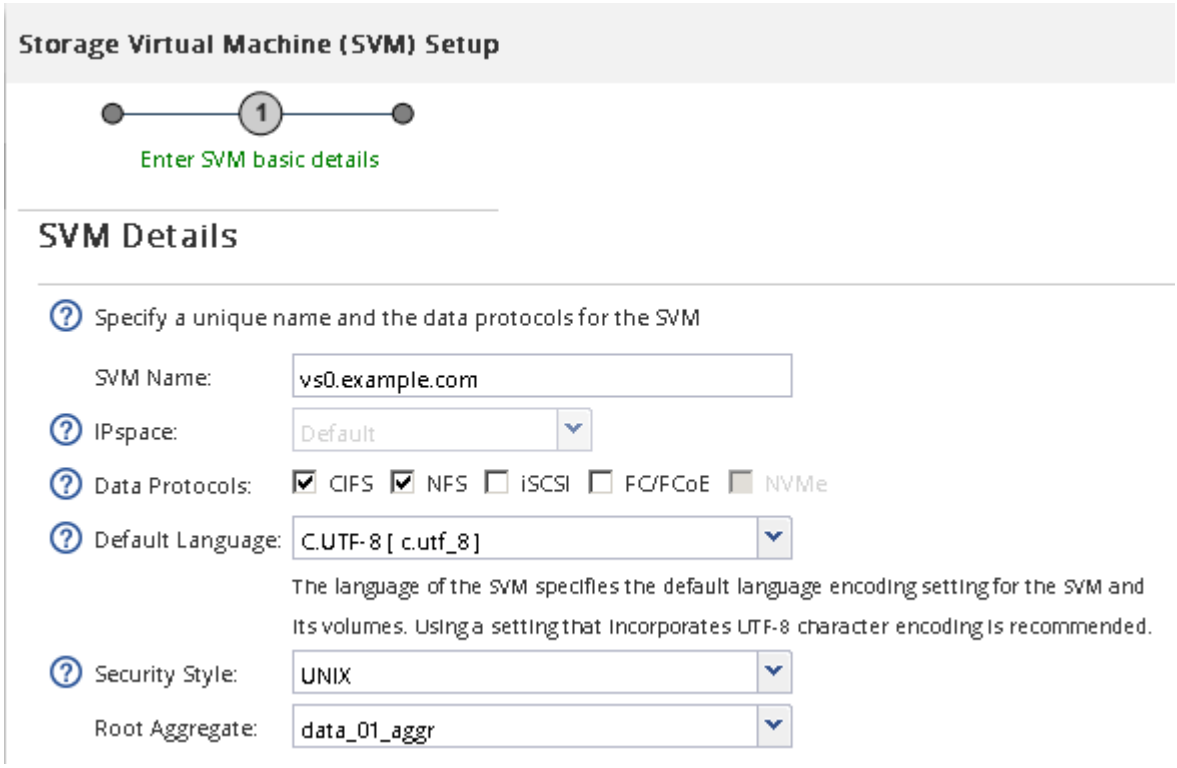
This language is inherited by the volume that you create later, and a volume's language cannot be changed.

d. **Optional**: If you enabled the CIFS protocol, change the security style to **UNIX**.

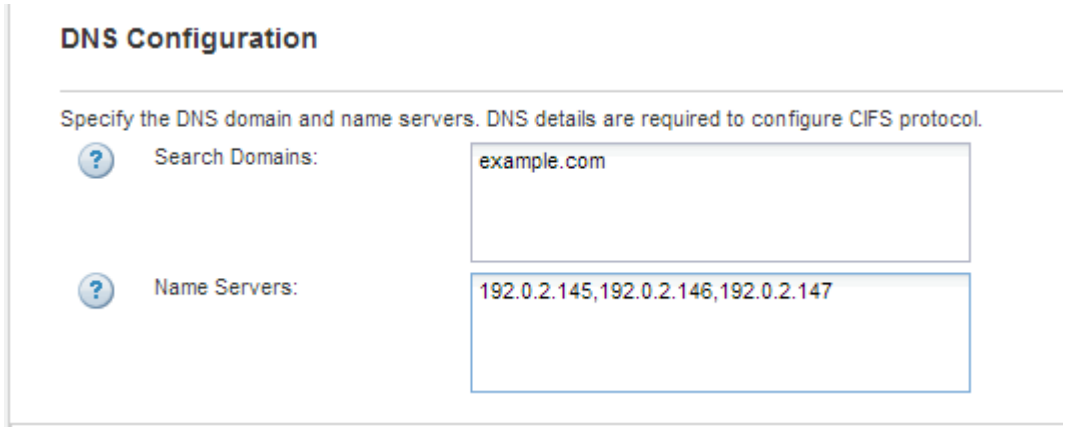
Selecting the CIFS protocol sets the security style to NTFS by default.

e. **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 automatically when you provision storage in a later step.



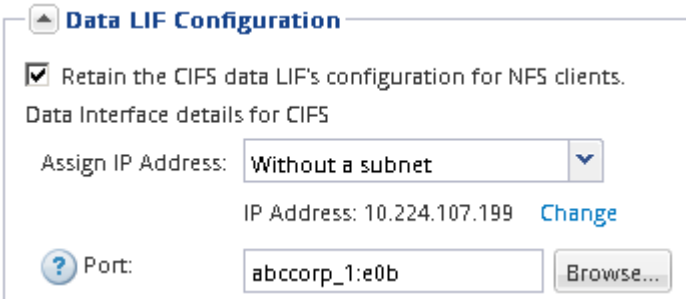
f. In the **DNS Configuration** area, ensure that the default DNS search domain and name servers are the ones that you want to use for this SVM.



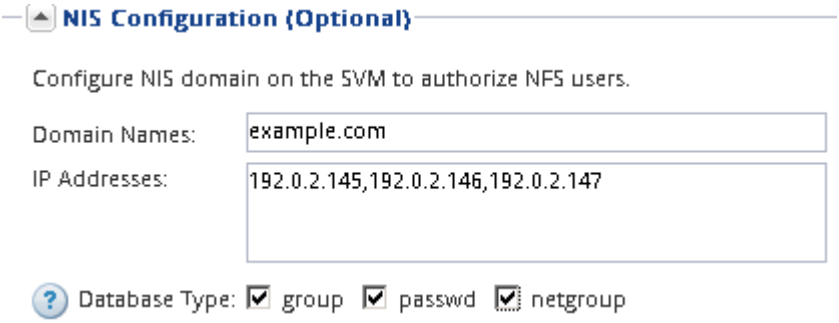
g. Click **Submit & Continue**.

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

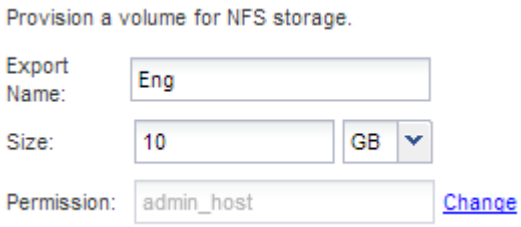
4. In the **Data LIF Configuration** section of the **Configure CIFS/NFS protocol** page, specify the details of the LIF that clients will use to access data:
   a. Assign an IP address to the LIF automatically from a subnet you specify or manually enter the address.
   b. Click **Browse** and select a node and port that will be associated with the LIF.



5. If the **NIS Configuration** area is collapsed, expand it.
6. If your site uses NIS for name services or name mapping, specify the domain and IP addresses of the NIS servers.

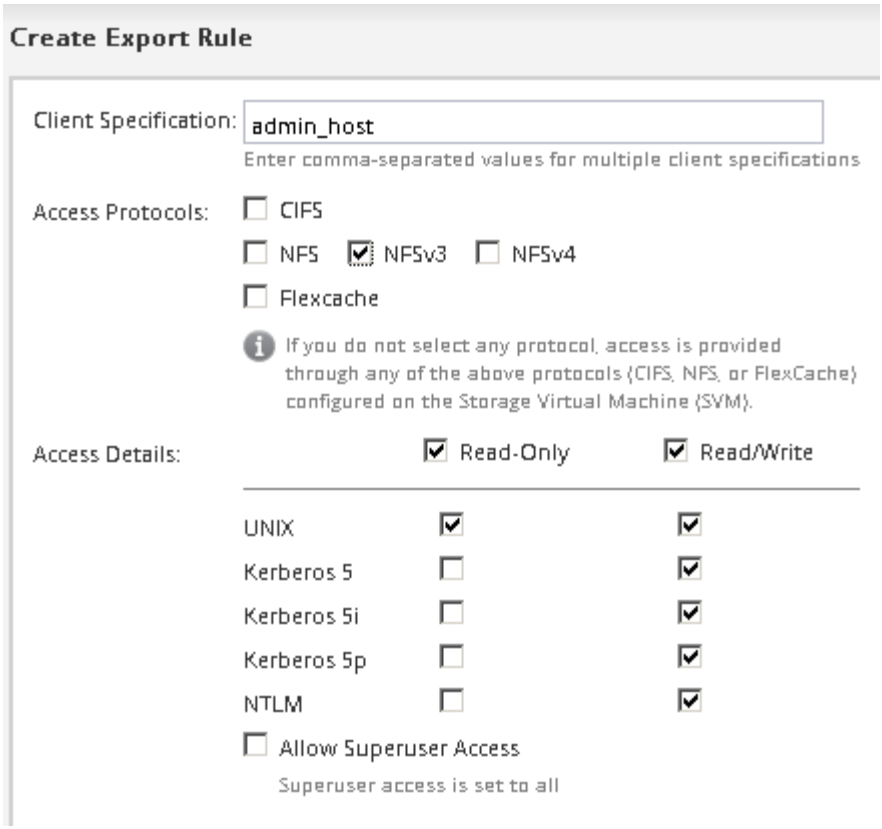


7. Create and export a volume for NFS access:
   a. For **Export Name**, type a name that will be both the export name and the beginning of the volume name.
   b. Specify a size for the volume that will contain the files.



   You do not have to specify the aggregate for the volume because it is automatically located on the aggregate with the most available space.

   c. In the **Permission** field, click **Change**, and specify an export rule that gives NFSv3 access to a UNIX administration host, including Superuser access.



You can create a 10 GB volume named Eng, export it as Eng, and add a rule that gives the “admin_host” client full access to the export, including Superuser access.

8. Click **Submit & Continue**.

   The following objects are created:

   - A data LIF named after the SVM with the suffix “_nfs_lif1”
   - An NFS server
   - A volume that is located on the aggregate with the most available space and has a name that matches the name of the export and ends in the suffix “_NFS_volume”
   - An export for the volume
   - An export policy with the same name as the export

9. For all other protocol configuration pages that are displayed, click **Skip** and configure the protocol later.
10. 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**.
11. Review the **Summary** page, record any information you might require later and then click **OK**.

    NFS clients need to know the IP address of the data LIF.

Results

A new SVM is created with an NFS server containing a new volume that is exported for an administrator.

Open the export policy of the SVM root volume (Create a new NFS-enabled SVM)

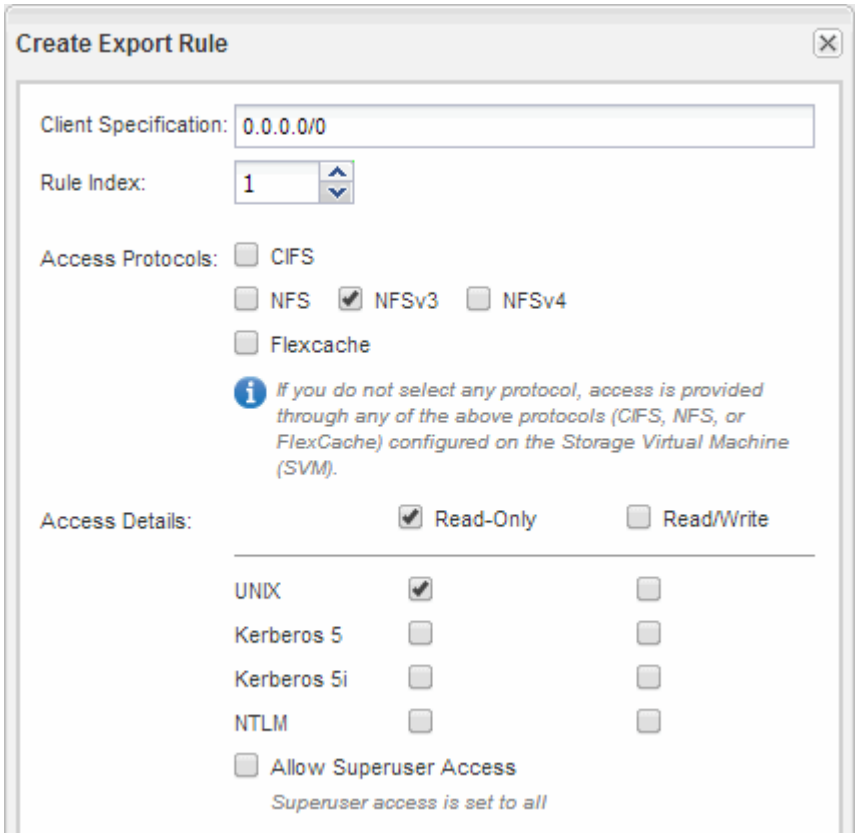
You must add a rule to the default export policy to allow all clients access through NFSv3. Without such a rule, all NFS clients are denied access to the storage virtual machine (SVM) and its volumes.

About this task

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

Steps

1. Navigate to the **SVMs** window.
2. Click the **SVM Settings** tab.
3. In the **Policies** pane, click **Export Policies**.
4. Select the export policy named **default**, which is applied to the SVM root volume.
5. In the lower pane, click **Add**.
6. 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**.



Results

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

Configure LDAP (Create a new NFS-enabled SVM)

If you want the storage virtual machine (SVM) to get user information from Active Directory-based Lightweight Directory Access Protocol (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 (CLI) and other documentation to configure LDAP. For more information, see Overview of using LDAP.

- 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

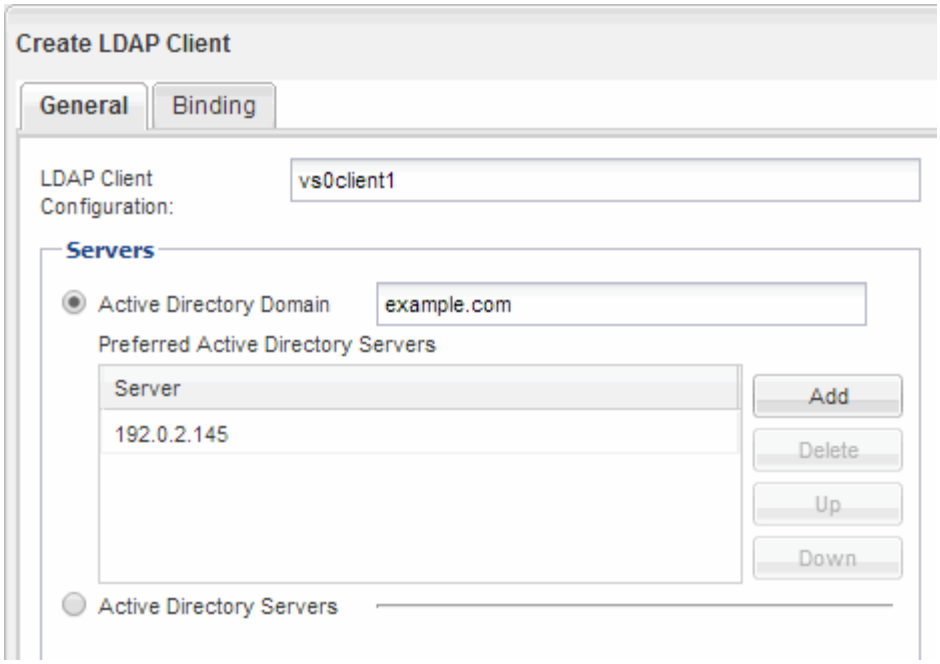
1. Navigate to the **SVMs** window.
2. Select the required SVM
3. Click the **SVM Settings** tab.
4. Set up an LDAP client for the SVM to use:

   a. In the **Services** pane, click **LDAP Client**.

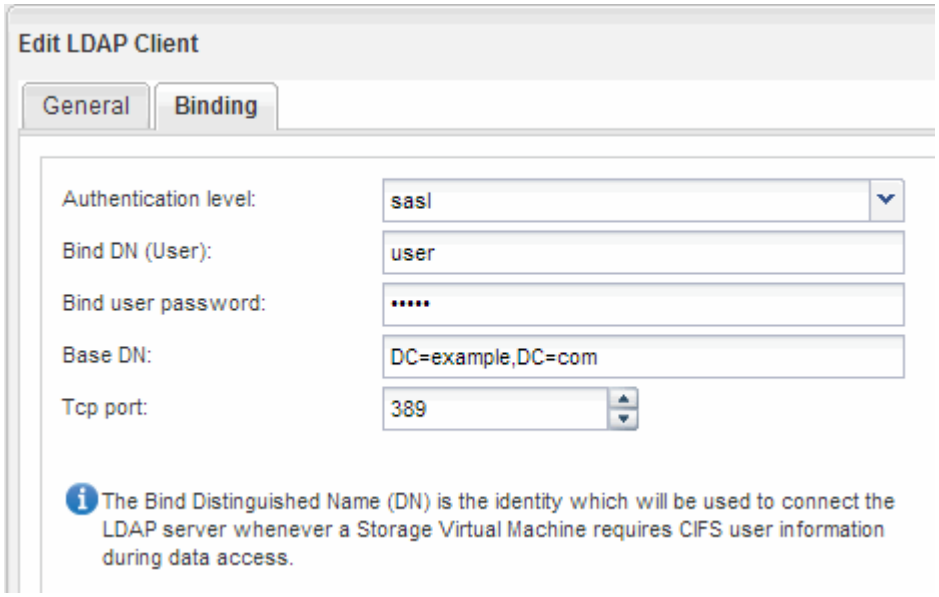
   b. In the **LDAP Client Configuration** window, click **Add**.

   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.

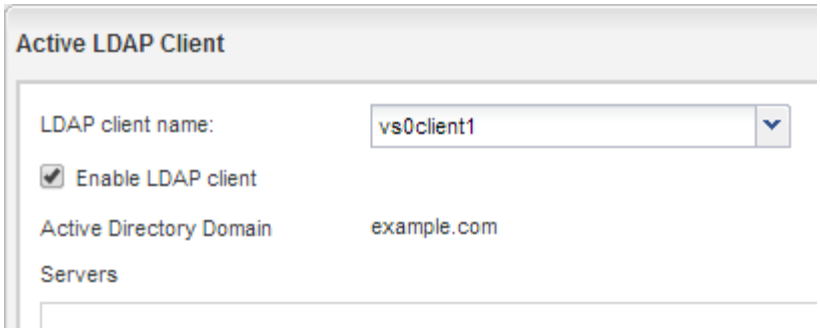
5. Enable the new LDAP client for the SVM:

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

   b. Click **Edit**.

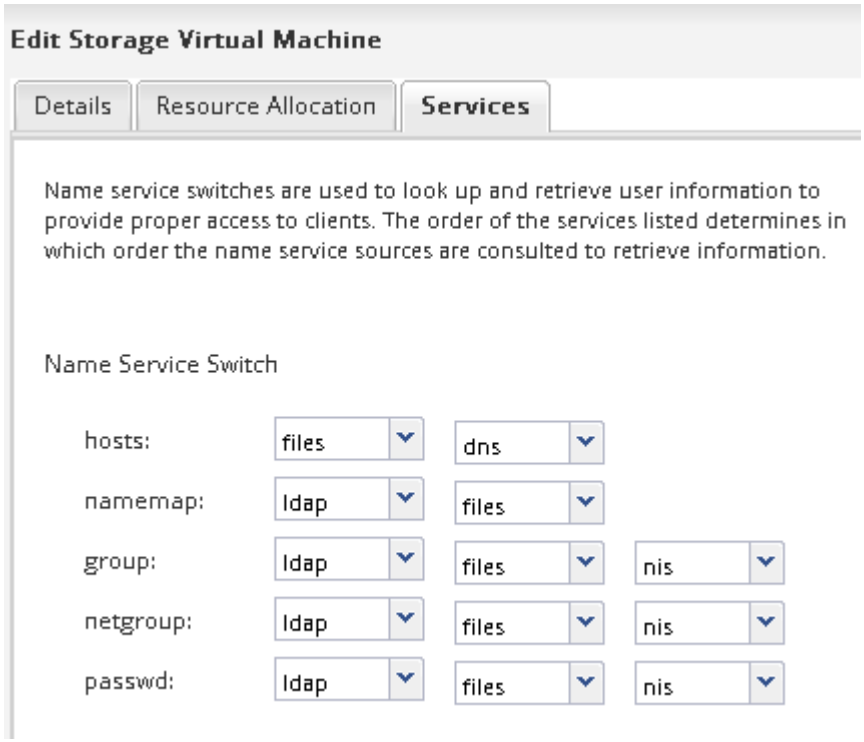
   c. Ensure that the client you just created is selected in **LDAP client name**.

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



The SVM uses the new LDAP client.

6. Give LDAP priority over other sources of user information, such as Network Information Service (NIS) and local users and groups:
   a. Navigate to the **SVMs** window.
   b. Select the SVM and click **Edit**.
   c. Click the **Services** tab.
   d. Under **Name Service Switch**, specify **LDAP** as the preferred name service switch source for the database types.
   e. Click **Save and Close**.



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

Verify NFS access from a UNIX administration host

After you configure NFS access to storage virtual machine (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.

   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.

```
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 ..
```

Results

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

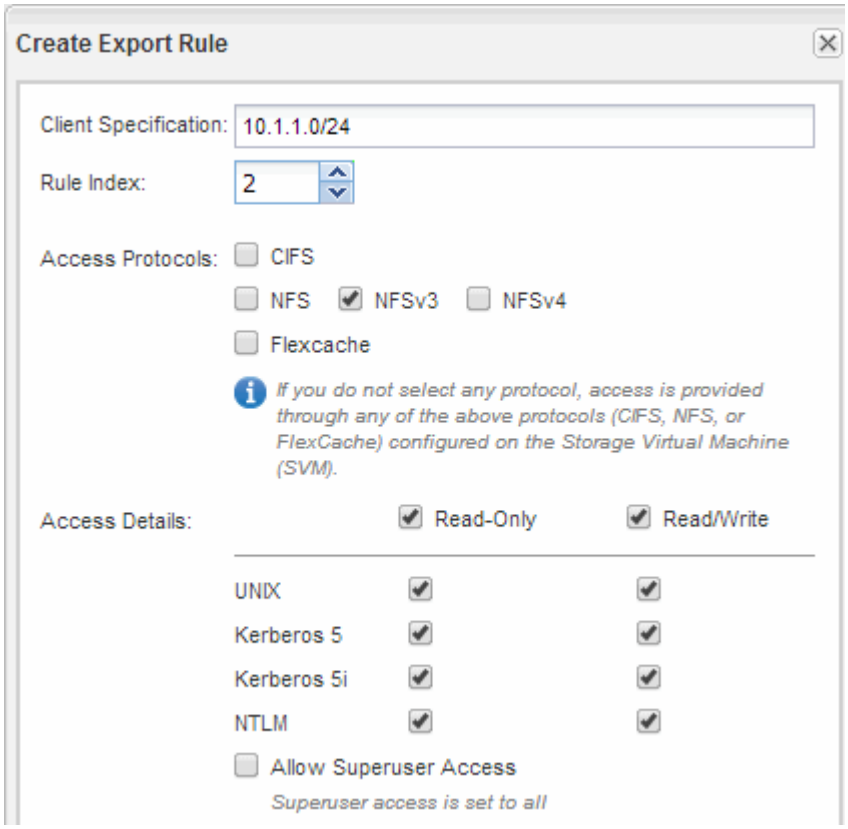
Configure and verify NFS client access (Create a new NFS-enabled SVM)

When you are ready, you can give select clients access to the share by setting UNIX file permissions on a UNIX administration host and adding an export rule in System Manager. 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. On a UNIX administration host, use the root user to set UNIX ownership and permissions on the volume.
3. In System Manager, add rules to the export policy to permit NFS clients to access the share.
   a. Select the storage virtual machine (SVM), and click **SVM Settings**.
   b. In the **Policies** pane, click **Export Policies**.
   c. Select the export policy with the same name as the volume.
   d. In the **Export Rules** tab, click **Add**, and specify a set of clients.
   e. Select **2** for the **Rule Index** so that this rule executes after the rule that allows access to the administration host.
   f. Select **NFSv3**.
   g. Specify the access details that you want, and click **OK.**

      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**.



4. 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.