SMB/CIFS configuration

System Manager Classic

NetApp
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SMB/CIFS configuration overview

Using the ONTAP System Manager classic interface (ONTAP 9.7 and earlier), you can quickly set up SMB/CIFS access to a new volume on either a new or existing storage virtual machine (SVM).

Use this procedure if you want to configure access to a volume in the following way:

- You want to use best practices, not explore every available option.
- Your data network uses the default IPspace, the default broadcast domain, and the default failover group.

  If your data network is flat, using these default objects ensures that LIFs will fail over correctly in the event of a link failure. If you are not using the default objects, you should refer to the Network management documentation for information on how to configure LIF path failover.

- NTFS file permissions will be used to secure the new volume.

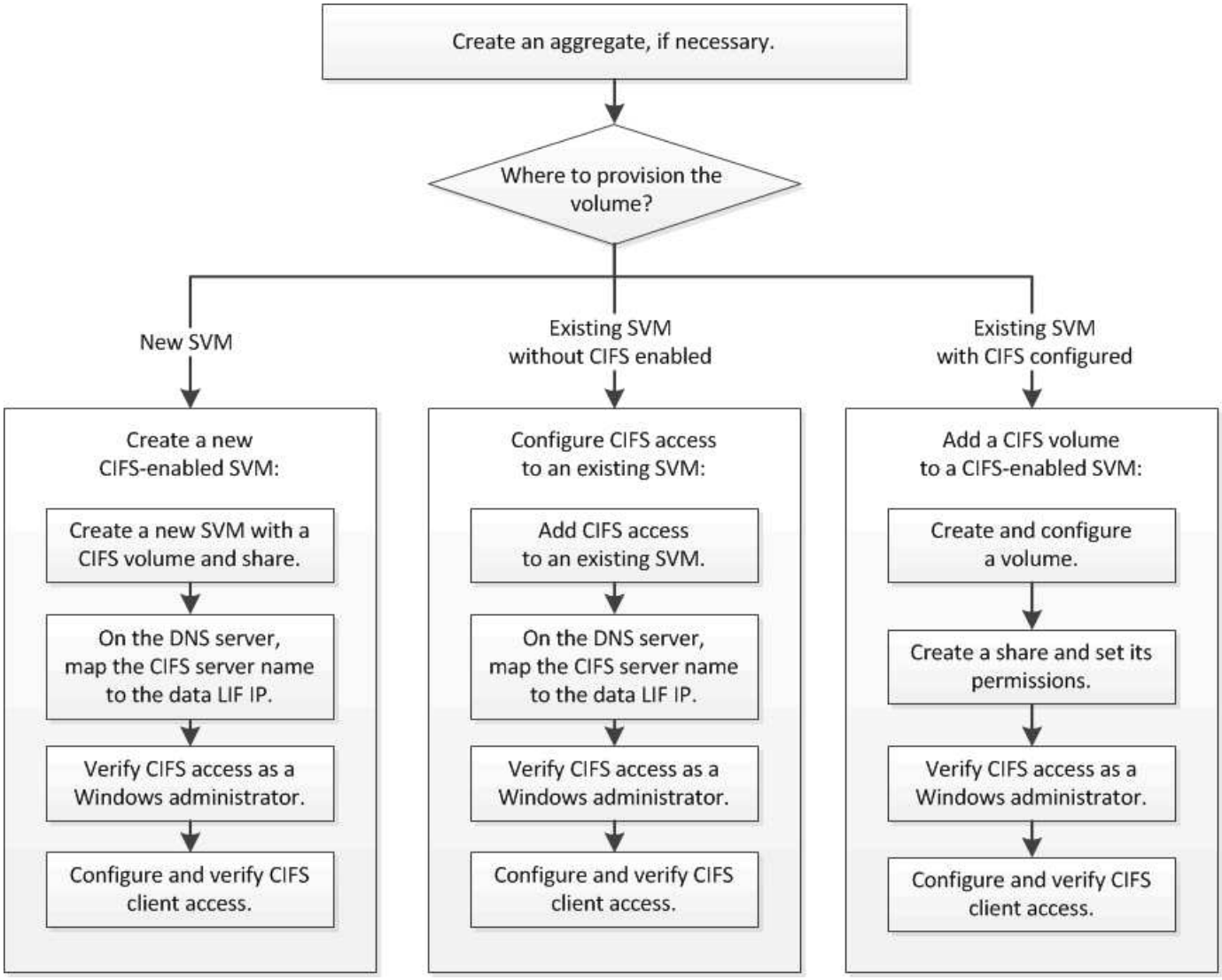
If you want details about the range of ONTAP SMB protocol capabilities, consult the SMB reference overview.

Other ways to do this in ONTAP

To perform these tasks with…	See this content…
The redesigned System Manager (available with ONTAP 9.7 and later)	Provision NAS storage for Windows servers using SMB
The ONTAP command line interface	SMB configuration overview with the CLI

SMB/CIFS configuration workflow

Configuring SMB/CIFS involves optionally creating an aggregate and then choosing a workflow that is specific to your goal—creating a new CIFS-enabled SVM, configuring CIFS access to an existing SVM, or simply adding a CIFS volume to an existing SVM that is already fully configured for CIFS access.



Create an aggregate

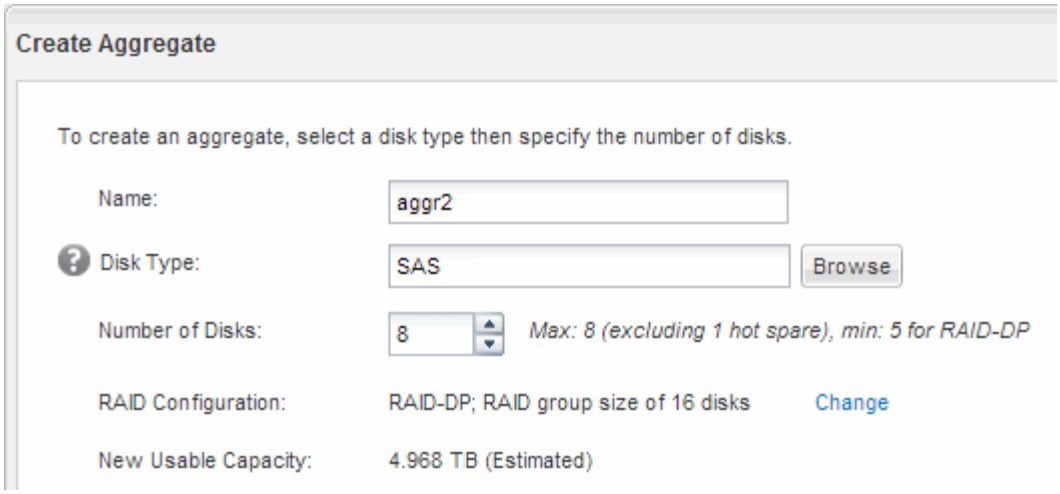
If you do not want to use an existing aggregate, you can create a new aggregate to provide physical storage to the volume which you are provisioning.

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. Navigate to the **Aggregates** window.
3. Click **Create.**
4. Follow the instructions on the screen to create the aggregate using the default RAID-DP configuration, and then click **Create**.



Results

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

Decide where to provision the new volume

Before you create a new CIFS volume, you must decide whether to place it in an existing storage virtual machine (SVM), and, if so, how much configuration the SVM requires. This decision determines your workflow.

Procedure

- If you want to provision a volume on a new SVM, create a new CIFS-enabled SVM.

  Creating a new CIFS-enabled SVM

  You must choose this option if CIFS is not enabled on an existing SVM.

- If you want to provision a volume on an existing SVM on which CIFS is enabled but not configured, configure CIFS/SMB access on the existing SVM.

  Configuring CIFS/SMB access on an existing SVM

  You should choose this option if you created the SVM for SAN access by using the procedure in this content.

- If you want to provision a volume on an existing SVM that is fully configured for CIFS access, add a CIFS volume to the CIFS-enabled SVM.

  Adding a CIFS volume to a CIFS-enabled SVM

Create a new CIFS-enabled SVM

Setting up a new CIFS-enabled SVM involves creating the new SVM with a CIFS volume and share, adding a mapping on the DNS server, and verifying CIFS access from a Windows administration host. You can then configure CIFS client access.

Create a new SVM with a CIFS volume and share

You can use a wizard that guides you through the process of creating a new storage virtual machine (SVM), configuring Domain Name System (DNS), creating a data logical interface (LIF), configuring a CIFS server, and creating and sharing 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
  - Active Directory (AD) domain that this SVM will join, along with the credentials required to add the SVM to it
- 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 NFS access is required eventually, you must select **NFS** now so that CIFS and NFS clients can share the same data LIF.

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

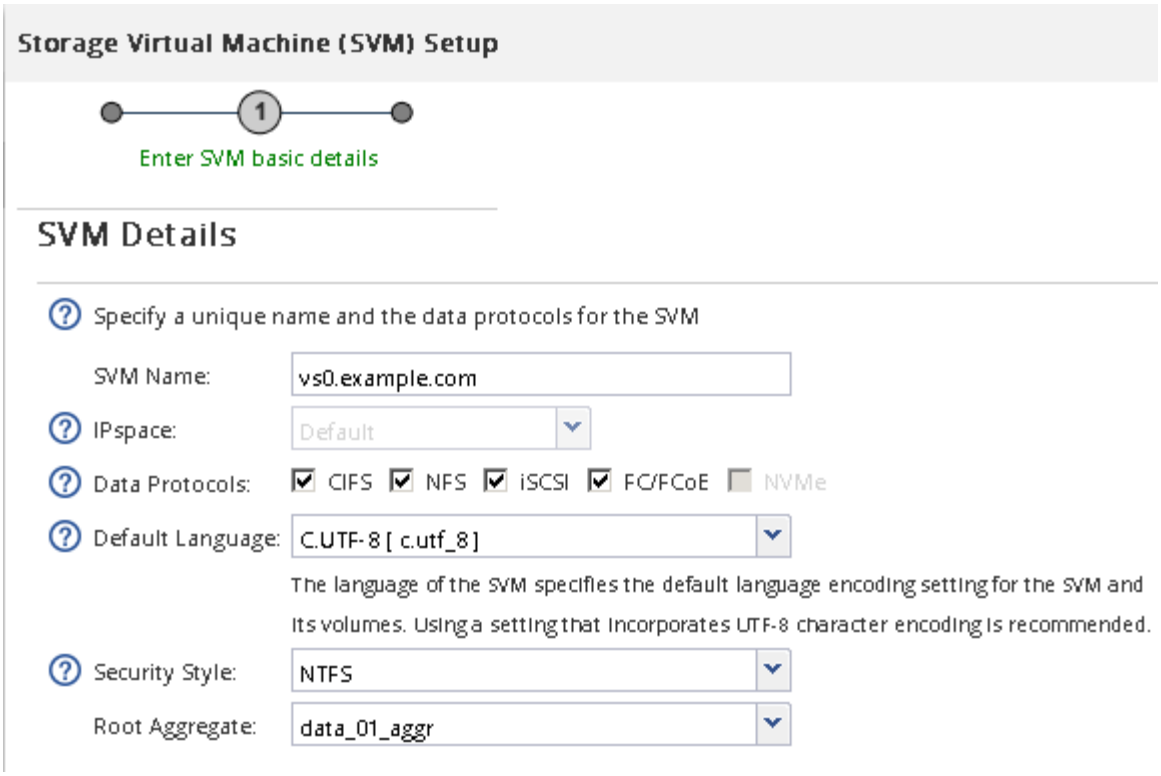
      

      If you support international character display in both NFS and SMB/CIFS clients, consider using the **UTF8MB4** language code, which is available beginning with ONTAP 9.5.

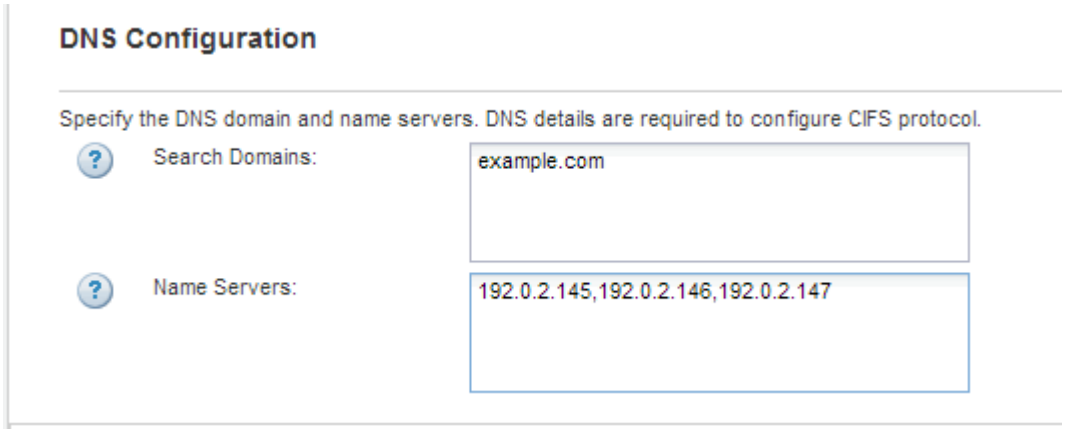
      This language is inherited by the volume that you create later, and a volume's language cannot be changed.

   d. 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.



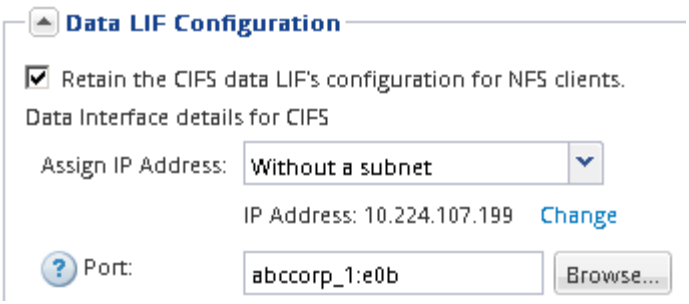
e. In the **DNS Configuration** area, ensure that the default DNS search domain and name servers are the ones that you want to use for this SVM.



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

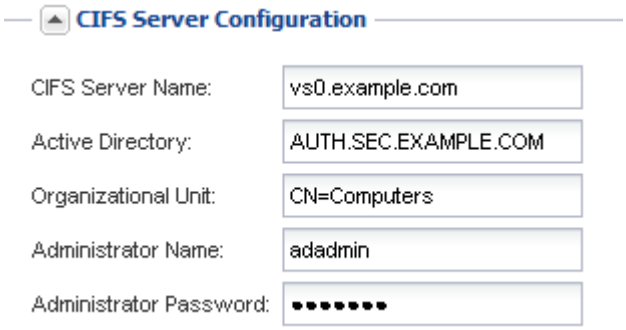
   a. Specify a name for the CIFS server that is unique in the AD domain.

   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.

   e. If you want to avoid unauthorized access to all the shares on this SVM, select the option to encrypt data using SMB 3.0.

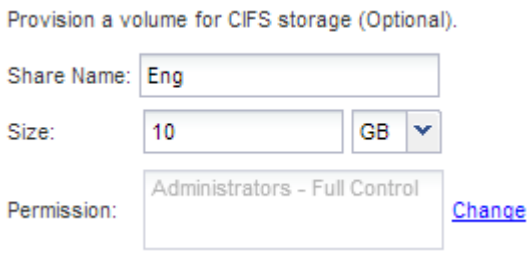


6. Create a volume for CIFS/SMB access and provision a share on it:

   a. Name the share that CIFS/SMB clients will use to access the volume.

      The name you enter for the share will also be used as the volume name.

   b. Specify a size for the volume.



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

7. Restrict access to the share by modifying the share ACL:

a. In the **Permission** field, click **Change**.
b. 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. Select the new administrator group, and then select **Full Control**.
e. Click **Save and Close**.

8. Click **Submit & Continue**.

   The following objects are created:

   - A data LIF named after the SVM with the suffix "_cifs_lif1"
   - A CIFS server that is part of the AD domain
   - A volume that is located on the aggregate with the most available space and has a name that matches the name of the share and ends in the suffix "_CIFS_volume"
   - A share on the volume

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**.

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

Results

A new SVM is created with a CIFS server containing a new volume that is shared.

Map the SMB server on the DNS server

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

About this task

If you use NetBIOS aliases for the SMB server name, it is a best practice to create DNS server entry points for each alias.

Steps

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

3. If you use NetBIOS aliases, create an Alias canonical name (CNAME resource record) lookup entry to map each alias to the IP address of the SMB server's data LIF.

Results

After the mapping is propagated across the network, Windows users can map a drive to the SMB server name or its NetBIOS aliases.

Verify SMB client access

You should verify that you have configured SMB correctly by accessing and writing data to the share. You should test access using the SMB server name and any NetBIOS aliases.

Steps

1. Log in to a Windows client.
2. Test access using the SMB server name:

   a. In Windows Explorer, map a drive to the share in the following format: `\\SMB_Server_Name\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 SMB server name later.

      If the SMB server is named vs1.example.com and the share is named SHARE1, you should enter the following: `\\vs0.example.com\SHARE1`

   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 SMB server name.

3. Repeat Step 2 for any NetBIOS aliases.

Configure and verify CIFS client access

When you are ready, you can give select clients access to the share by setting NTFS file permissions in Windows Explorer and modifying the share ACL 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 Windows client, use an administrator role to give the users or groups permissions to the files and folders.
   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.
3. In System Manager, modify the share ACL to give Windows users or groups access to the share.
   a. Navigate to the **Shares** window.

b. Select the share, and click **Edit**.

c. Select the **Permissions** tab, and give the users or groups access to the share.

4. 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.

Configure SMB/CIFS access to an existing SVM

Adding access for SMB/CIFS clients to an existing SVM involves adding CIFS configurations to the SVM, adding a mapping on the DNS server, and verifying CIFS access from a Windows administration host. You can then configure CIFS client access.

Add CIFS access to an existing SVM

Adding CIFS/SMB access to an existing SVM involves creating a data LIF, configuring a CIFS server, provisioning a volume, sharing the volume, and configuring the share permissions.

Before you begin

- 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
  - The Active Directory (AD) domain that this SVM will join, along with the credentials required to add the SVM to it
- Any external firewalls must be appropriately configured to allow access to network services.
- The CIFS protocol must be allowed on the SVM.

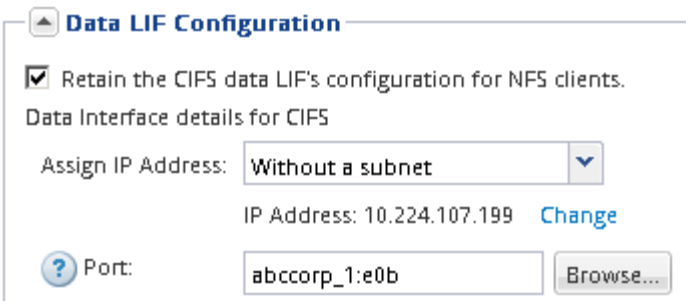
  This is the case if you did not created the SVM following the procedure in this content to configure a SAN protocol.

Steps

1. Navigate to the area where you can configure the protocols of the SVM:
   a. Select the SVM that you want to configure.
   b. 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.



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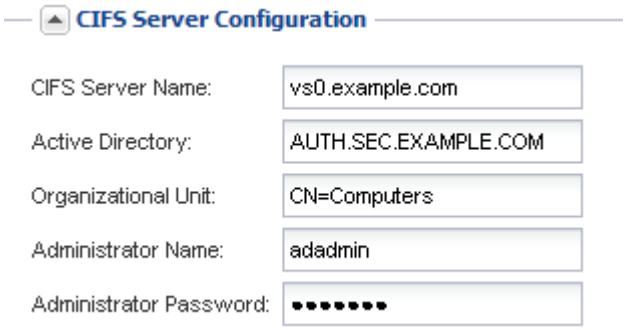
   d. Specify the name and password of an administrative account that has sufficient privileges to add the CIFS server to the OU.

   e. If you want to avoid unauthorized access to all the shares on this SVM, select the option to encrypt data using SMB 3.0.

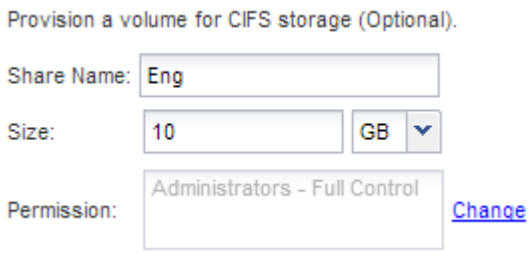


4. Create a volume for CIFS/SMB access and provision a share on it:

   a. Name the share that CIFS/SMB clients will use to access the volume.

      The name you enter for the share will also be used as the volume name.

   b. Specify a size for the volume.



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

5. Restrict access to the share by modifying the share ACL:

a. In the **Permission** field, click **Change**.

b. 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. Select the new administrator group, and then select **Full Control**.

e. Click **Save and Close**.

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

Map the SMB server on the DNS server

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

About this task

If you use NetBIOS aliases for the SMB server name, it is a best practice to create DNS server entry points for each alias.

Steps

1. Log in to the DNS server.
2. Create forward (A - Address record) and reverse (PTR - Pointer record) lookup entries to map the SMB server name to the IP address of the data LIF.
3. If you use NetBIOS aliases, create an Alias canonical name (CNAME resource record) lookup entry to map each alias to the IP address of the SMB server's data LIF.

Results

After the mapping is propagated across the network, Windows users can map a drive to the SMB server name or its NetBIOS aliases.

Verify SMB client access

You should verify that you have configured SMB correctly by accessing and writing data to the share. You should test access using the SMB server name and any NetBIOS aliases.

Steps

1. Log in to a Windows client.
2. Test access using the SMB server name:

   a. In Windows Explorer, map a drive to the share in the following format: `\\SMB_Server_Name\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 SMB server name later.

If the SMB server is named vs1.example.com and the share is named SHARE1, you should enter the following: `\\vs0.example.com\SHARE1`

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 SMB server name.

3. Repeat Step 2 for any NetBIOS aliases.

Configure and verify CIFS client access

When you are ready, you can give select clients access to the share by setting NTFS file permissions in Windows Explorer and modifying the share ACL 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 Windows client, use an administrator role to give the users or groups permissions to the files and folders.
   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.
3. In System Manager, modify the share ACL to give Windows users or groups access to the share.
   a. Navigate to the **Shares** window.
   b. Select the share, and click **Edit**.
   c. Select the **Permissions** tab, and give the users or groups access to the share.
4. 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.

Add a CIFS volume to a CIFS-enabled SVM

Adding a CIFS volume to a CIFS-enabled SVM involves creating and configuring a volume, creating a share and setting its permissions, and verifying access from a Windows administration host. You can then configure CIFS client access.

Before you begin

CIFS must be completely set up on the SVM.

Create and configure 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. Navigate to the **Volumes** window.
2. Click **Create** > **Create FlexVol**.

   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.

7. 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. Navigate to the **Namespace** window.

   b. Select the **SVM** from the drop-down menu.

   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.

   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.

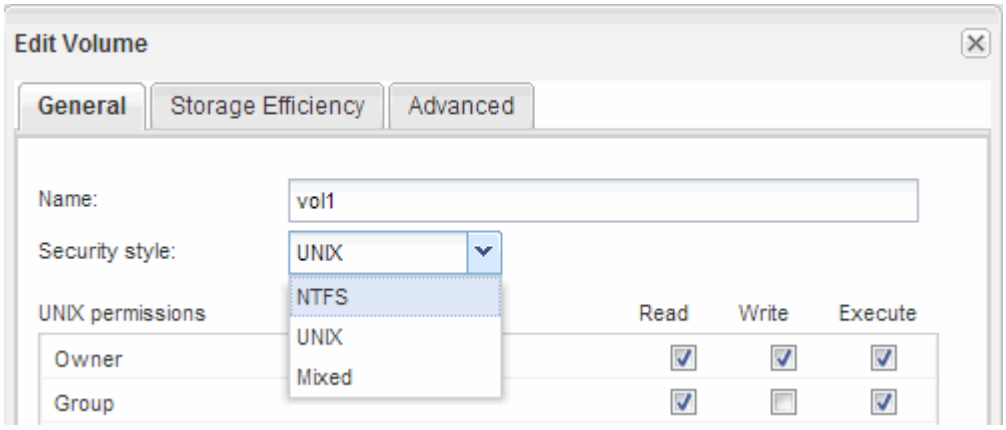
   + image::../media/namespace_1_before_smb.gif[This graphic is described by the surrounding text.]

8. Review the volume’s security style and change it, if necessary:

   a. In the **Volume** window, 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. Make sure the security style is NTFS.



Create a share and set 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. Navigate to the **Shares** window.
2. Create a share so that SMB clients can access the volume:
   a. Click **Create Share**.
   b. In the **Create Share** dialog box, click **Browse**, expand the namespace hierarchy, and then select the volume that you created earlier.
   c. If you want the share name to be different from the volume name, change the share name.
   d. Click **Create**.

   The share is created with a default ACL set to Full Control for the Everyone group.
3. Restrict access to the share by modifying the share ACL:
   a. Select the share, and then click **Edit**.
   b. In the **Permissions** tab, select the **Everyone** group, and then click **Remove**.
   c. Click **Add**, and then 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.

What to do next

You should verify access as a Windows administrator.

Verify SMB client access

You should verify that you have configured SMB correctly by accessing and writing data to the share. You should test access using the SMB server name and any NetBIOS aliases.

Steps

1. Log in to a Windows client.
2. Test access using the SMB server name:
   a. In Windows Explorer, map a drive to the share in the following format: `\\SMB_Server_Name\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 SMB server name later.

If the SMB server is named vs1.example.com and the share is named SHARE1, you should enter the following: `\\vs0.example.com\SHARE1`

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 SMB server name.

3. Repeat Step 2 for any NetBIOS aliases.

Configure and verify CIFS client access

When you are ready, you can give select clients access to the share by setting NTFS file permissions in Windows Explorer and modifying the share ACL 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 Windows client, use an administrator role to give the users or groups permissions to the files and folders.
   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.
3. In System Manager, modify the share ACL to give Windows users or groups access to the share.
   a. Navigate to the **Shares** window.
   b. Select the share, and click **Edit**.
   c. Select the **Permissions** tab, and give the users or groups access to the share.
4. 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.