Configure SMB access to an SVM

ONTAP 9

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If you do not already have an SVM configured for SMB client access, you must either create and configure a new SVM or configure an existing SVM. Configuring SMB involves opening SVM root volume access, creating an SMB server, creating a LIF, enabling host-name resolution, configuring name services, and if desired, enabling Kerberos security.

Create an SVM

If you do not already have at least one SVM in a cluster to provide data access to SMB clients, you must create one.

Steps

1. Create an SVM: `vserver create -vserver vserver_name -rootvolume root_volume_name -aggregate aggregate_name -rootvolume-security-style ntfs -language C.UTF-8 -ipspace ipspace_name`
   - Use the NTFS setting for the `-rootvolume-security-style` option.
   - Use the default C.UTF-8 `-language` option.
   - The `ipspace` setting is optional.
2. Verify the configuration and status of the newly created SVM: `vserver show -vserver vserver_name`

   The `Allowed Protocols` field must include CIFS. You can edit this list later.

   The `Vserver Operational State` field must display the `running` state. If it displays the `initializing` state, it means that some intermediate operation such as root volume creation failed, and you must delete the SVM and re-create it.

Examples

The following command creates an SVM for data access in the IPspace ipspaceA:

```
cluster1::> vserver create -vserver vs1.example.com -rootvolume root_vs1
-aggregate aggr1
-rootvolume-security-style ntfs -language C.UTF-8 -ipspace ipspaceA

[Job 2059] Job succeeded:
Vserver creation completed
```

The following command shows that an SVM was created with a root volume of 1 GB, and it was started automatically and is in `running` state. The root volume has a default export policy that does not include any rules, so the root volume is not exported upon creation.

```
cluster1::> vserver show -vserver vs1.example.com
                                    Vserver: vs1.example.com
                                Vserver Type: data
                             Vserver Subtype: default
                                Vserver UUID: b8375669-19b0-11e5-b9d1-
00a0983d9736
                                Root Volume: root_vs1
                                  Aggregate: aggr1
                                NIS Domain: -
                  Root Volume Security Style: ntfs
                                 LDAP Client: -
               Default Volume Language Code: C.UTF-8
                             Snapshot Policy: default
                                     Comment:
                                Quota Policy: default
                 List of Aggregates Assigned: -
 Limit on Maximum Number of Volumes allowed: unlimited
                        Vserver Admin State: running
                  Vserver Operational State: running
   Vserver Operational State Stopped Reason: -
                          Allowed Protocols: nfs, cifs, fcp, iscsi, ndmp
                       Disallowed Protocols: -
                           QoS Policy Group: -
                                Config Lock: false
                               IPspace Name: ipspaceA
```

Verify that the SMB protocol is enabled on the SVM

Before you can configure and use SMB on SVMs, you must verify that the protocol is enabled.

About this task

This is typically done during SVM setup, but if you did not enable the protocol during setup, you can enable it later by using the `vserver add-protocols` command.

> You cannot add or remove a protocol from a LIF once it is created.

You can also disable protocols on SVMs using the `vserver remove-protocols` command.

Steps

1. Check which protocols are currently enabled and disabled for the SVM: `vserver show -vserver vserver_name -protocols`

   You can also use the `vserver show-protocols` command to view the currently enabled protocols on all SVMs in the cluster.

2. If necessary, enable or disable a protocol:
   - To enable the SMB protocol: `vserver add-protocols -vserver vserver_name -protocols cifs`
   - To disable a protocol: `vserver remove-protocols -vserver vserver_name -protocols protocol_name[,protocol_name,...]`
3. Confirm that the enabled and disabled protocols were updated correctly: `vserver show -vserver vserver_name -protocols`

Example

The following command displays which protocols are currently enabled and disabled (allowed and disallowed) on the SVM named vs1:

```
vs1::> vserver show -vserver vs1.example.com -protocols
Vserver           Allowed Protocols         Disallowed Protocols
-----------       ----------------------    -----------------------
vs1.example.com   cifs                       nfs, fcp, iscsi, ndmp
```

The following command allows access over SMB by adding `cifs` to the list of enabled protocols on the SVM named vs1:

```
vs1::> vserver add-protocols -vserver vs1.example.com -protocols cifs
```

Open the export policy of the SVM root volume

The default export policy of the SVM root volume must include a rule to allow all clients open access through SMB. Without such a rule, all SMB clients are denied access to the SVM and its volumes.

About this task

When a new SVM is created, a default export policy (called default) is created automatically for the root volume of the SVM. You must create one or more rules for the default export policy before clients can access data on the SVM.

You should verify that all SMB access is open in the default export policy, and later restrict access to individual volumes by creating custom export policies for individual volumes or qtrees.

Steps

1. If you are using an existing SVM, check the default root volume export policy: `vserver export-policy rule show`

   The command output should be similar to the following:

```
cluster::> vserver export-policy rule show -vserver vs1.example.com
-policyname default -instance

                                    Vserver: vs1.example.com
                                Policy Name: default
                                 Rule Index: 1
                            Access Protocol: cifs
Client Match Hostname, IP Address, Netgroup, or Domain: 0.0.0.0/0
                             RO Access Rule: any
                             RW Access Rule: any
User ID To Which Anonymous Users Are Mapped: 65534
                   Superuser Security Types: any
               Honor SetUID Bits in SETATTR: true
                  Allow Creation of Devices: true
```

If such a rule exists that allows open access, this task is complete. If not, proceed to the next step.

2. Create an export rule for the SVM root volume: `vserver export-policy rule create -vserver vserver_name -policyname default -ruleindex 1 -protocol cifs -clientmatch 0.0.0.0/0 -rorule any -rwrule any -superuser any`
3. Verify rule creation by using the `vserver export-policy rule show` command.

Results

Any SMB client can now access any volume or qtree created on the SVM.

Create a LIF

A LIF is an IP address associated with a physical or logical port. If there is a component failure, a LIF can fail over to or be migrated to a different physical port, thereby continuing to communicate with the network.

Before you begin

- The underlying physical or logical network port must have been configured to the administrative `up` status.
- If you are planning to use a subnet name to allocate the IP address and network mask value for a LIF, the subnet must already exist.

  Subnets contain a pool of IP addresses that belong to the same layer 3 subnet. They are created using the `network subnet create` command.

- The mechanism for specifying the type of traffic handled by a LIF has changed. For ONTAP 9.5 and earlier, LIFs used roles to specify the type of traffic it would handle. Beginning with ONTAP 9.6, LIFs use service policies to specify the type of traffic it would handle.

About this task

- You can create both IPv4 and IPv6 LIFs on the same network port.
- If you have a large number of LIFs in your cluster, you can verify the LIF capacity supported on the cluster

by using the `network interface capacity show` command and the LIF capacity supported on each node by using the `network interface capacity details show` command (at the advanced privilege level).

- Beginning with ONTAP 9.7, if other LIFs already exist for the SVM in the same subnet, you do not need to specify the home port of the LIF. ONTAP automatically chooses a random port on the specified home node in the same broadcast domain as the other LIFs already configured in the same subnet.

Beginning with ONTAP 9.4, FC-NVMe is supported. If you are creating an FC-NVMe LIF you should be aware of the following:

- The NVMe protocol must be supported by the FC adapter on which the LIF is created.
- FC-NVMe can be the only data protocol on data LIFs.
- One LIF handling management traffic must be configured for every storage virtual machine (SVM) supporting SAN.
- NVMe LIFs and namespaces must be hosted on the same node.
- Only one NVMe LIF handling data traffic can be configured per SVM

Steps

1. Create a LIF:

   `network interface create -vserver` *`vserver_name`* `-lif` *`lif_name`* `-role data -data -protocol cifs -home-node` *`node_name`* `-home-port` *`port_name`* `{-address` *`IP_address`* `-netmask IP_address | -subnet-name` *`subnet_name`*`} -firewall-policy data -auto -revert {true|false}`

   ONTAP 9.5 and earlier

   `network interface create -vserver` *`vserver_name`* `-lif` *`lif_name`* `-role data -data -protocol cifs -home-node` *`node_name`* `-home-port` *`port_name`* `{-address` *`IP_address`* `-netmask` *`IP_address`* `| -subnet-name` *`subnet_name`*`} -firewall-policy data -auto -revert {true|false}`

   ONTAP 9.6 and later

   `network interface create -vserver` *`vserver_name`* `-lif` *`lif_name`* `-service-policy` *`service_policy_name`* `-home-node` *`node_name`* `-home-port` *`port_name`* `{-address` *`IP_address`* `-netmask` *`IP_address`* `| -subnet-name` *`subnet_name`*`} -firewall-policy data -auto-revert {true|false}`

   - The `-role` parameter is not required when creating a LIF using a service policy (beginning with ONTAP 9.6).
   - The `-data-protocol` parameter must be specified when the LIF is created, and cannot be modified later without destroying and re-creating the data LIF.

     The `-data-protocol` parameter is not required when creating a LIF using a service policy (beginning with ONTAP 9.6).

   - `-home-node` is the node to which the LIF returns when the `network interface revert` command is run on the LIF.

You can also specify whether the LIF should automatically revert to the home-node and home-port with the `-auto-revert` option.

- `-home-port` is the physical or logical port to which the LIF returns when the `network interface revert` command is run on the LIF.
- You can specify an IP address with the `-address` and `-netmask` options, or you enable allocation from a subnet with the `-subnet_name` option.
- When using a subnet to supply the IP address and network mask, if the subnet was defined with a gateway, a default route to that gateway is added automatically to the SVM when a LIF is created using that subnet.
- If you assign IP addresses manually (without using a subnet), you might need to configure a default route to a gateway if there are clients or domain controllers on a different IP subnet. The `network route create` man page contains information about creating a static route within an SVM.
- For the `-firewall-policy` option, use the same default `data` as the LIF role.

  You can create and add a custom firewall policy later if desired.

- `-auto-revert` allows you to specify whether a data LIF is automatically reverted to its home node under circumstances such as startup, changes to the status of the management database, or when the network connection is made. The default setting is `false`, but you can set it to `false` depending on network management policies in your environment.

2. Verify that the LIF was created successfully:

   `network interface show`

3. Verify that the configured IP address is reachable:

To verify an…	Use…
IPv4 address	`network ping`
IPv6 address	`network ping6`

Examples

The following command creates a LIF and specifies the IP address and network mask values using the `-address` and `-netmask` parameters:

```
network interface create -vserver vs1.example.com -lif datalif1 -role data
-data-protocol cifs -home-node node-4 -home-port e1c -address 192.0.2.145
-netmask 255.255.255.0 -firewall-policy data -auto-revert true
```

The following command creates a LIF and assigns IP address and network mask values from the specified subnet (named client1_sub):

```
network interface create -vserver vs3.example.com -lif datalif3 -role data
-data-protocol cifs -home-node node-3 -home-port e1c -subnet-name
client1_sub -firewall-policy data -auto-revert true
```

The following command shows all the LIFs in cluster-1. Data LIFs datalif1 and datalif3 are configured with IPv4 addresses, and datalif4 is configured with an IPv6 address:

```
network interface show

            Logical    Status     Network          Current      Current Is
Vserver     Interface  Admin/Oper Address/Mask     Node         Port
Home
----------- ---------- ---------- ---------------- ------------ -------
----
cluster-1
            cluster_mgmt up/up    192.0.2.3/24     node-1       e1a
true
node-1
            clus1        up/up    192.0.2.12/24    node-1       e0a
true
            clus2        up/up    192.0.2.13/24    node-1       e0b
true
            mgmt1        up/up    192.0.2.68/24    node-1       e1a
true
node-2
            clus1        up/up    192.0.2.14/24    node-2       e0a
true
            clus2        up/up    192.0.2.15/24    node-2       e0b
true
            mgmt1        up/up    192.0.2.69/24    node-2       e1a
true
vs1.example.com
            datalif1     up/down  192.0.2.145/30   node-1       e1c
true
vs3.example.com
            datalif3     up/up    192.0.2.146/30   node-2       e0c
true
            datalif4     up/up    2001::2/64       node-2       e0c
true
5 entries were displayed.
```

The following command shows how to create a NAS data LIF that is assigned with the `default-data-files` service policy:

```
network interface create -vserver vs1 -lif lif2 -home-node node2 -homeport
e0d -service-policy default-data-files -subnet-name ipspace1
```

Enable DNS for host-name resolution

You can use the `vserver services name-service dns` command to enable DNS on an SVM, and configure it to use DNS for host-name resolution. Host names are resolved using external DNS servers.

Before you begin

A site-wide DNS server must be available for host name lookups.

You should configure more than one DNS server to avoid a single-point-of-failure. The `vserver services name-service dns create` command issues a warning if you enter only one DNS server name.

About this task

The *Network Management Guide* contains information about configuring dynamic DNS on the SVM.

Steps

1. Enable DNS on the SVM: `vserver services name-service dns create -vserver vserver_name -domains domain_name -name-servers ip_addresses -state enabled`

   The following command enables external DNS server servers on the SVM vs1:

   ```
   vserver services name-service dns create -vserver vs1.example.com
   -domains example.com -name-servers 192.0.2.201,192.0.2.202 -state
   enabled
   ```

   > Beginning with ONTAP 9.2, the `vserver services name-service dns create` command performs an automatic configuration validation and reports an error message if ONTAP cannot contact the name server.

2. Display the DNS domain configurations by using the `vserver services name-service dns show` command. ``

   The following command displays the DNS configurations for all SVMs in the cluster:

```
vserver services name-service dns show
                                                 Name
Vserver           State     Domains              Servers
----------------- --------- -------------------- -------------
cluster1          enabled   example.com          192.0.2.201,
                                                 192.0.2.202
vs1.example.com   enabled   example.com          192.0.2.201,
                                                 192.0.2.202
```

The following command displays detailed DNS configuration information for SVM vs1:

```
vserver services name-service dns show -vserver vs1.example.com
               Vserver: vs1.example.com
               Domains: example.com
          Name Servers: 192.0.2.201, 192.0.2.202
    Enable/Disable DNS: enabled
        Timeout (secs): 2
      Maximum Attempts: 1
```

3. Validate the status of the name servers by using the `vserver services name-service dns check` command.

   The `vserver services name-service dns check` command is available beginning with ONTAP 9.2.

```
vserver services name-service dns check -vserver vs1.example.com

Vserver           Name Server     Status       Status Details
---------------  -------------   ----------
--------------------------
vs1.example.com   10.0.0.50         up         Response time (msec): 2
vs1.example.com   10.0.0.51         up         Response time (msec): 2
```

Set up an SMB server in an Active Directory domain

Configure time services

Before creating an SMB server in an Active Domain controller, you must ensure that the cluster time and the time on the domain controllers of the domain to which the SMB server will belong matches to within five minutes.

About this task

You should configure cluster NTP services to use the same NTP servers for time synchronization that the

Active Directory domain uses.

Beginning with ONTAP 9.5, you can set up your NTP server with symmetric authentication.

Steps

1. Configure time services by using the `cluster time-service ntp server create` command.
   - To configure time services without symmetric authentication enter the following command: `cluster time-service ntp server create -server server_ip_address`
   - To configure time services with symmetric authentication, enter the following command: `cluster time-service ntp server create -server server_ip_address -key-id key_id cluster time-service ntp server create -server 10.10.10.1 cluster time-service ntp server create -server 10.10.10.2`
2. Verify that time services are set up correctly by using the `cluster time-service ntp server show` command.

   `cluster time-service ntp server show`

```
Server                         Version
------------------------------ -------
10.10.10.1                     auto
10.10.10.2                     auto
```

Commands for managing symmetric authentication on NTP servers

Beginning with ONTAP 9.5, Network Time Protocol (NTP) version 3 is supported. NTPv3 includes symmetric authentication using SHA-1 keys which increases network security.

To do this…	Use this command…
Configure an NTP server without symmetric authentication	`cluster time-service ntp server create -server server_name`
Configure an NTP server with symmetric authentication	`cluster time-service ntp server create -server server_ip_address -key-id key_id`
Enable symmetric authentication for an existing NTP serverAn existing NTP server can be modified to enable authentication by adding the required key-id.	`cluster time-service ntp server modify -server server_name -key-id key_id`

To do this…	Use this command…
Configure a shared NTP key	`cluster time-service ntp key create -id shared_key_id -type shared_key_type -value shared_key_value` Shared keys are referred to by an ID. The ID, its type, and value must be identical on both the node and the NTP server
Configure an NTP server with an unknown key ID	`cluster time-service ntp server create -server server_name -key-id key_id`
Configure a server with a key ID not configured on the NTP server.	`cluster time-service ntp server create -server server_name -key-id key_id` The key ID, type, and value must be identical to the key ID, type, and value configured on the NTP server.
Disable symmetric authentication	`cluster time-service ntp server modify -server server_name -authentication disabled`

Create an SMB server in an Active Directory domain

You can use the `vserver cifs create` command to create an SMB server on the SVM and specify the Active Directory (AD) domain to which it belongs.

Before you begin

The SVM and LIFs that you are using to serve data must have been configured to allow the SMB protocol. The LIFs must be able to connect to the DNS servers that are configured on the SVM and to an AD domain controller of the domain to which you want to join the SMB server.

Any user who is authorized to create machine accounts in the AD domain to which you are joining the SMB server can create the SMB server on the SVM. This can include users from other domains.

Beginning with ONTAP 9.7, your AD administrator can provide you with a URI to a keytab file as an alternative to providing you with a name and password to a privileged Windows account. When you receive the URI, include it in the `-keytab-uri` parameter with the `vserver cifs` commands.

About this task

When creating an SMB server in an Activity Directory domain:

- You must use the fully qualified domain name (FQDN) when specifying the domain.
- The default setting is to add the SMB server machine account to the Active Directory CN=Computer object.
- You can choose to add the SMB server to a different organizational unit (OU) by using the `-ou` option.

- You can optionally choose to add a comma-delimited list of one or more NetBIOS aliases (up to 200) for the SMB server.

  Configuring NetBIOS aliases for an SMB server can be useful when you are consolidating data from other file servers to the SMB server and want the SMB server to respond to the original servers' names.

The `vserver cifs` man pages contain additional optional parameters and naming requirements.

> Beginning with ONTAP 9.1, you can enable SMB version 2.0 to connect to a domain controller (DC). Doing so is necessary if you have disabled SMB 1.0 on domain controllers. Beginning with ONTAP 9.2, SMB 2.0 is enabled by default.

Beginning with ONTAP 9.8, you can specify that connections to domain controllers be encrypted. ONTAP requires encryption for domain controller communications when the `-encryption-required-for-dc-connection` option is set to `true`; the default is `false`. When the option is set, only the SMB3 protocol will be used for ONTAP-DC connections, because encryption is only supported by SMB3. .

SMB management contains more information about SMB server configuration options.

Steps

1. Verify that SMB is licensed on your cluster: `system license show -package cifs`

   If it is not, contact your sales representative.

   A CIFS license is not required if the SMB server will be used for authentication only.

2. Create the SMB server in an AD domain: `vserver cifs create -vserver vserver_name -cifs-server smb_server_name -domain FQDN [-ou organizational_unit][-netbios-aliases NetBIOS_name, ...][-keytab-uri {(ftp|http)://hostname|IP_address}][-comment text]`

   When joining a domain, this command might take several minutes to finish.

   The following command creates the SMB server “smb_server01” in the domain “example.com”:

   ```
   cluster1::> vserver cifs create -vserver vs1.example.com -cifs-server
   smb_server01 -domain example.com
   ```

   The following command creates the SMB server “smb_server02” in the domain “mydomain.com” and authenticates the ONTAP administrator with a keytab file:

   ```
   cluster1::> vserver cifs create -vserver vs1.mydomain.com -cifs-server
   smb_server02 -domain mydomain.com -keytab-uri
   http://admin.mydomain.com/ontap1.keytab
   ```

3. Verify the SMB server configuration by using the `vserver cifs show` command.

   In this example, the command output shows that an SMB server named “SMB_SERVER01” was created on SVM vs1.example.com, and was joined to the “example.com” domain.

```
cluster1::> vserver cifs show -vserver vs1

                                          Vserver: vs1.example.com
                        CIFS Server NetBIOS Name: SMB_SERVER01
                    NetBIOS Domain/Workgroup Name: EXAMPLE
                      Fully Qualified Domain Name: EXAMPLE.COM
Default Site Used by LIFs Without Site Membership:
                             Authentication Style: domain
                CIFS Server Administrative Status: up
                          CIFS Server Description: -
                          List of NetBIOS Aliases: -
```

4. If desired, enable encrypted communication with the domain controller (ONTAP 9.8 and later): `vserver cifs security modify -vserver svm_name -encryption-required-for-dc-connection true`

Examples

The following command creates a SMB server named “smb_server02” on SVM vs2.example.com in the “example.com” domain. The machine account is created in the “OU=eng,OU=corp,DC=example,DC=com” container. The SMB server is assigned a NetBIOS alias.

```
cluster1::> vserver cifs create -vserver vs2.example.com –cifs-server
smb_server02 -domain example.com –ou OU=eng,OU=corp -netbios-aliases
old_cifs_server01

cluster1::> vserver cifs show -vserver vs1
                                        Vserver: vs2.example.com
                      CIFS Server NetBIOS Name: SMB_SERVER02
                  NetBIOS Domain/Workgroup Name: EXAMPLE
                    Fully Qualified Domain Name: EXAMPLE.COM
Default Site Used by LIFs Without Site Membership:
                           Authentication Style: domain
              CIFS Server Administrative Status: up
                        CIFS Server Description: -
                        List of NetBIOS Aliases: OLD_CIFS_SERVER01
```

The following command enables a user from a different domain, in this case an administrator of a trusted domain, to create a SMB server named “smb_server03” on SVM vs3.example.com. The `-domain` option specifies the name of the home domain (specified in the DNS configuration) in which you want to create the SMB server. The `username` option specifies the administrator of the trusted domain.

- Home domain: example.com
- Trusted domain: trust.lab.com
- Username for the trusted domain: Administrator1

```
cluster1::> vserver cifs create -vserver vs3.example.com -cifs-server
smb_server03 -domain example.com

Username: Administrator1@trust.lab.com
Password: . . .
```

Create keytab files for SMB authentication

Beginning with ONTAP 9.7, ONTAP supports SVM authentication with Active Directory (AD) servers using keytab files. AD administrators generate a keytab file and make it available to ONTAP administrators as a uniform resource identifier (URI), which is supplied when `vserver cifs` commands require Kerberos authentication with the AD domain.

AD administrators can create the keytab files using the standard Windows Server `ktpass` command. The command should be run on the primary domain where authentication is required. The `ktpass` command can be used to generate keytab files only for primary domain users; keys generated using trusted-domain users are not supported.

Keytab files are generated for specific ONTAP admin users. As long as the admin user's password does not change, the keys generated for the specific encryption type and domain will not change. Therefore, a new keytab file is required whenever the admin user's password is changed.

The following encryption types are supported:

- AES256-SHA1
- DES-CBC-MD5

  ⓘ ONTAP does not support DES-CBC-CRC encryption type.

- RC4-HMAC

AES256 is the highest encryption type and should be used if enabled on the ONTAP system.

Keytab files can be generated by specifying either the admin password or by using a randomly-generated password. However, at any given time only one password option can be used, because a private key specific to the admin user is needed at the AD server for decrypting the keys inside the keytab file. Any change in the private key for a specific admin will invalidate the keytab file.

Set up an SMB server in a workgroup

Set up an SMB server in a workgroup overview

Setting up an SMB server as a member in a workgroup consists of creating the SMB server, and then creating local users and groups.

You can configure an SMB server in a workgroup when the Microsoft Active Directory domain infrastructure is not available.

An SMB server in workgroup mode supports only NTLM authentication and does not support Kerberos authentication.

Create an SMB server in a workgroup

You can use the `vserver cifs create` command to create an SMB server on the SVM and specify the workgroup to which it belongs.

Before you begin

The SVM and LIFs that you are using to serve data must have been configured to allow the SMB protocol. The LIFs must be able to connect to the DNS servers that are configured on the SVM.

About this task

SMB servers in workgroup mode do not support the following SMB features:

- SMB3 Witness protocol
- SMB3 CA shares
- SQL over SMB
- Folder Redirection
- Roaming Profiles
- Group Policy Object (GPO)
- Volume Snapshot Service (VSS)

The `vserver cifs` man pages contain additional optional configuration parameters and naming requirements.

Steps

1. Verify that SMB is licensed on your cluster: `system license show -package cifs`

   If it is not, contact your sales representative.

   A CIFS license is not required if the SMB server will be used for authentication only.

2. Create the SMB server in a workgroup: `vserver cifs create -vserver vserver_name -cifs -server cifs_server_name -workgroup workgroup_name [-comment text]`

   The following command creates the SMB server “smb_server01” in the workgroup “workgroup01”:

   ```
   cluster1::> vserver cifs create -vserver vs1.example.com -cifs-server
   SMB_SERVER01 -workgroup workgroup01
   ```

3. Verify the SMB server configuration by using the `vserver cifs show` command.

   In the following example, the command output shows that a SMB server named “smb_server01” was created on SVM vs1.example.com in the workgroup “workgroup01”:

```
cluster1::> vserver cifs show -vserver vs0

                                          Vserver: vs1.example.com
                        CIFS Server NetBIOS Name: SMB_SERVER01
                    NetBIOS Domain/Workgroup Name: workgroup01
                      Fully Qualified Domain Name: -
                              Organizational Unit: -
Default Site Used by LIFs Without Site Membership: -
                                   Workgroup Name: workgroup01
                              Authentication Style: workgroup
                CIFS Server Administrative Status: up
                          CIFS Server Description:
                          List of NetBIOS Aliases: -
```

After you finish

For a CIFS server in a workgroup, you must create local users, and optionally local groups, on the SVM.

Related information

SMB management

Create local user accounts

You can create a local user account that can be used to authorize access to data contained in the SVM over an SMB connection. You can also use local user accounts for authentication when creating an SMB session.

About this task

Local user functionality is enabled by default when the SVM is created.

When you create a local user account, you must specify a user name and you must specify the SVM with which to associate the account.

The `vserver cifs users-and-groups local-user` man pages contain details about optional parameters and naming requirements.

Steps

1. Create the local user: `vserver cifs users-and-groups local-user create -vserver` *`vserver_name`* `-user-name` *`user_name optional_parameters`*

   The following optional parameters might be useful:

   - `-full-name`

     The users's full name.

   - `-description`

     A description for the local user.

- `-is-account-disabled {true|false}`

  Specifies whether the user account is enabled or disabled. If this parameter is not specified, the default is to enable the user account.

The command prompts for the local user's password.

2. Enter a password for the local user, and then confirm the password.
3. Verify that the user was successfully created: `vserver cifs users-and-groups local-user show -vserver vserver_name`

Example

The following example creates a local user "SMB_SERVER01\sue", with a full name "Sue Chang", associated with SVM vs1.example.com:

```
cluster1::> vserver cifs users-and-groups local-user create -vserver
vs1.example.com -user-name SMB_SERVER01\sue -full-name "Sue Chang"

Enter the password:
Confirm the password:

cluster1::> vserver cifs users-and-groups local-user show
Vserver  User Name                   Full Name  Description
-------- --------------------------- ---------- -------------
vs1      SMB_SERVER01\Administrator             Built-in administrator
account
vs1      SMB_SERVER01\sue            Sue Chang
```

Create local groups

You can create local groups that can be used for authorizing access to data associated with the SVM over an SMB connection. You can also assign privileges that define what user rights or capabilities a member of the group has.

About this task

Local group functionality is enabled by default when the SVM is created.

When you create a local group, you must specify a name for the group and you must specify the SVM with which to associate the group. You can specify a group name with or without the local domain name, and you can optionally specify a description for the local group. You cannot add a local group to another local group.

The `vserver cifs users-and-groups local-group` man pages contain details about optional parameters and naming requirements.

Steps

1. Create the local group: `vserver cifs users-and-groups local-group create -vserver vserver_name -group-name group_name`

The following optional parameter might be useful:

- `-description`

  A description for the local group.

2. Verify that the group was successfully created: `vserver cifs users-and-groups local-group show -vserver vserver_name`

Example

The following example creates a local group “SMB_SERVER01\engineering” associated with SVM vs1:

```
cluster1::> vserver cifs users-and-groups local-group create -vserver
vs1.example.com -group-name SMB_SERVER01\engineering

cluster1::> vserver cifs users-and-groups local-group show -vserver
vs1.example.com
Vserver          Group Name                     Description
---------------- ------------------------------ ----------------------------
vs1.example.com  BUILTIN\Administrators         Built-in Administrators
group
vs1.example.com  BUILTIN\Backup Operators       Backup Operators group
vs1.example.com  BUILTIN\Power Users            Restricted administrative
privileges
vs1.example.com  BUILTIN\Users                  All users
vs1.example.com  SMB_SERVER01\engineering
vs1.example.com  SMB_SERVER01\sales
```

After you finish

You must add members to the new group.

Manage local group membership

You can manage local group membership by adding and removing local or domain users, or adding and removing domain groups. This is useful if you want to control access to data based on access controls placed on the group, or if you want users to have privileges associated with that group.

About this task

If you no longer want a local user, domain user, or domain group to have access rights or privileges based on membership in a group, you can remove the member from the group.

You must keep the following in mind when adding members to a local group:

- You cannot add users to the special *Everyone* group.
- You cannot add a local group to another local group.
- To add a domain user or group to a local group, ONTAP must be able to resolve the name to a SID.

You must keep the following in mind when removing members from a local group:

- You cannot remove members from the special *Everyone* group.
- To remove a member from a local group, ONTAP must be able to resolve their name to a SID.

Steps

1. Add a member to or remove a member from a group.
   - Add a member: `vserver cifs users-and-groups local-group add-members -vserver vserver_name -group-name group_name -member-names name[,...]`

     You can specify a comma-delimited list of local users, domain users, or domain groups to add to the specified local group.

   - Remove a member: `vserver cifs users-and-groups local-group remove-members -vserver vserver_name -group-name group_name -member-names name[,...]`

     You can specify a comma-delimited list of local users, domain users, or domain groups to remove from the specified local group.

Examples

The following example adds a local user “SMB_SERVER01\sue” to the local group “SMB_SERVER01\engineering” on SVM vs1.example.com:

```
cluster1::> vserver cifs users-and-groups local-group add-members -vserver
vs1.example.com -group-name SMB_SERVER01\engineering -member-names
SMB_SERVER01\sue
```

The following example removes the local users “SMB_SERVER01\sue” and “SMB_SERVER01\james” from the local group “SMB_SERVER01\engineering” on SVM vs1.example.com:

```
cluster1::> vserver cifs users-and-groups local-group remove-members
-vserver vs1.example.com -group-name SMB_SERVER\engineering -member-names
SMB_SERVER\sue,SMB_SERVER\james
```

Verify enabled SMB versions

Your ONTAP 9 release determines which SMB versions are enabled by default for connections with clients and domain controllers. You should verify that the SMB server supports the clients and functionality required in your environment.

About this task

For connections with both clients and domain controllers, you should enable SMB 2.0 and later whenever possible. For security reasons, you should avoid using SMB 1.0, and you should disable it if you have verified that it is not required in your environment.

In ONTAP 9, SMB versions 2.0 and later are enabled by default for client connections, but the version of SMB 1.0 enabled by default depends on your ONTAP release.

- Beginning with ONTAP 9.1 P8, SMB 1.0 can be disabled on SVMs.

  The `-smb1-enabled` option to the `vserver cifs options modify` command enables or disables SMB 1.0.

- Beginning with ONTAP 9.3, it is disabled by default on new SVMs.

If your SMB server is in an Active Directory (AD) domain, you can enable SMB 2.0 to connect to a domain controller (DC) beginning with ONTAP 9.1. Doing so is necessary if you have disabled SMB 1.0 on DCs. Beginning with ONTAP 9.2, SMB 2.0 is enabled by default for DC connections.

If `-smb1-enabled-for-dc-connections` is set to `false` while `-smb1-enabled` is set to `true`, ONTAP denies SMB 1.0 connections as the client, but continues to accept inbound SMB 1.0 connections as the server.

SMB management contains details about supported SMB versions and functionality.

Steps

1. Set the privilege level to advanced: `set -privilege advanced`
2. Verify which SMB versions are enabled: `vserver cifs options show`

   You can scroll down the list to view the SMB versions enabled for client connections, and if you are configuring an SMB server in an AD domain, for AD domain connections.

3. Enable or disable the SMB protocol for client connections as required:

   - To enable an SMB version: `vserver cifs options modify -vserver vserver_namesmb_version true`
   - To disable an SMB version: `vserver cifs options modify -vserver vserver_namesmb_version false` Possible values for `smb_version`:
   - `-smb1-enabled`
   - `-smb2-enabled`
   - `-smb3-enabled`
   - `-smb31-enabled` The following command enables SMB 3.1 on SVM vs1.example.com:

   ```
   cluster1::*> vserver cifs options modify -vserver vs1.example.com -smb31
   -enabled true
   ```

4. If your SMB server is in an Active Directory domain, enable or disable the SMB protocol for DC connections as required:

   - To enable an SMB version: `vserver cifs security modify -vserver vserver_name -smb2-enabled-for-dc-connections true`
   - To disable an SMB version: `vserver cifs security modify -vserver vserver_name -smb2-enabled-for-dc-connections false`

5. Return to the admin privilege level: `set -privilege admin`

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.