Manage NVMe protocol

ONTAP 9

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Manage NVMe protocol

Start the NVMe service for an SVM

Before you can use the NVMe protocol on your storage virtual machine (SVM), you must start the NVMe service on the SVM.

Before you begin

NVMe must be allowed as a protocol on your system.

The following NVMe protocols are supported:

Protocol	Beginning with …	Allowed by…
TCP	ONTAP 9.10.1	Default
FCP	ONTAP 9.4	Default

Steps

1. Change the privilege setting to advanced:

   ```
   set -privilege advanced
   ```

2. Verify that NVMe is allowed as a protocol:

   ```
   vserver nvme show
   ```

3. Create the NVMe protocol service:

   ```
   vserver nvme create
   ```

4. Start the NVMe protocol service on the SVM:

   ```
   vserver nvme modify -status -admin up
   ```

Delete NVMe service from an SVM

If needed, you can delete the NVMe service from your storage virtual machine (SVM).

Steps

1. Change the privilege setting to advanced:

   ```
   set -privilege advanced
   ```

2. Stop the NVMe service on the SVM:

   ```
   vserver nvme modify -status -admin down
   ```

3. Delete the NVMe service:

   ```
   vserver nvme delete
   ```

Resize a namespace

Beginning with ONTAP 9.10.1, you can use the ONTAP CLI to increase or decrease the size of a NVMe namespace. You can use System Manager to increase the size of a NVMe namespace.

Increase the size of a namespace

System Manager

1. Click **Storage > NVMe Namespaces**.
2. Hoover over the namespace you want to increase, click ⋮, and then click **Edit**.
3. Under **CAPACITY**, change the size of the namespace.

CLI

1. Enter the following command: `vserver nvme namespace modify -vserver` *`SVM_name`* `-path` *`path`* `–size` *`new_size_of_namespace`*

Decrease the size of a namespace

You must use the ONTAP CLI to decrease the size of a NVMe namespace.

1. Change the privilege setting to advanced:

   ```
   set –privilege advanced
   ```

2. Decrease the size of the namespace:

   ```
   vserver nvme namespace modify -vserver SVM_name -path namespace_path -size
   new_size_of_namespace
   ```

Convert a namespace into a LUN

Beginning with ONTAP 9.11.1, you can use the ONTAP CLI to in-place convert an existing NVMe namespace to a LUN.

Before you start

- Specified NVMe namespace should not have any existing maps to a Subsystem.
- Namespace should not be part of a snapshot or on the destination side of SnapMirror relationship as a read-only namespace.
- Since NVMe namespaces are only supported with specific platforms and network cards, this feature only works with specific hardware.

Steps

1. You enter the following command to convert an NVMe namespace to a LUN:

```
lun convert-from-namespace -vserver -namespace-path
```

Set up secure authentication over NVMe/TCP

Beginning with ONTAP 9.12.1 secure, bidirectional and unidirectional authentication between an NVMe host and controller is supported over NVME/TCP using the DH-HMAC-CHAP authentication protocol.

To set up secure authentication, each host or controller must be associated with a DH-HMAC-CHAP key which is a combination of the NQN of the NVMe host or controller and an authentication secret configured by the administrator. In order for an NVMe host or controller to authenticate its peer, it must know the key associated with the peer. SHA-256 is the the default hash function and 2048-bit is the default DH group.

Steps

1. Add DH-HMAC-CHAP authentication to your NVMe subsystem:

   ```
   vserver nvme subsystem host add -vserver svm_name -subsystem subsystem -host
   -nqn host_nqn -dhchap-host-secret authentication_host_secret -dhchap
   -controller-secret authentication_controller_secret -dhchap-hash-function
   {sha-256|sha-512} -dhchap-group {none|2048-bit|3072-bit|4096-bit|6144-
   bit|8192-bit}
   ```

2. Verify that the DH-HMAC CHAP authentication protocol is added to your host:

   ```
   vserver nvme subsystem host show
   ```

   ```
     [ -dhchap-hash-function {sha-256|sha-512} ]  Authentication Hash
   Function
     [ -dhchap-group {none|2048-bit|3072-bit|4096-bit|6144-bit|8192-bit} ]
                                                  Authentication Diffie-
   Hellman
                                                  Group
     [ -dhchap-mode {none|unidirectional|bidirectional} ]
                                                  Authentication Mode
   ```

3. Verify that the DH-HMAC CHAP authentication was performed during NVMe controller creation:

   ```
   vserver nvme subsystem controller show
   ```

```
 [ -dhchap-hash-function {sha-256|sha-512} ]  Authentication Hash
Function
 [ -dhchap-group {none|2048-bit|3072-bit|4096-bit|6144-bit|8192-bit} ]
                                                Authentication Diffie-
Hellman
                                                Group
 [ -dhchap-mode {none|unidirectional|bidirectional} ]
                                                Authentication Mode
```

Disable secure authentication over NVMe/TCP

If you are running the NVMe/TCP protocol and you have established secure authentication using DH-HMAC-CHAP, you can choose to disable it at any time.

However, if you are reverting from ONTAP 9.12.1 or later to ONTAP 9.12.0 or earlier you must disable secure authentication before you revert. If secure authentication using DH-HMAC-CHAP is not disabled, revert will fail.

Steps

1. Remove the host from the subsystem to disable DH-HMAC-CHAP authentication:

   ```
   vserver nvme subsystem host remove –vserver svm_name -subsystem subsystem
   -host-nqn host_nqn
   ```

2. Verify that the DH-HMAC-CHAP authentication protocol is removed from the host:

   ```
   vserver nvme subsystem host show
   ```

3. Add the host back to the subsystem without authentication:

   ```
   vserver nvme subsystem host add –vserver svm_name -subsystem subsystem -host
   -nqn host_nqn
   ```

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