



# **Manage NVMe protocol**

ONTAP 9

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# Manage NVMe protocol

## NVMe Overview

Beginning with ONTAP 9.4, NVMe/FC is supported. Beginning with ONTAP 9.5 a license is required to support NVMe. If NVMe is enabled in ONTAP 9.4, a 90 day grace period is given to acquire the license after upgrading to ONTAP 9.5.

You can enable the license using the following command:

```
system license add -license-code NVMe_license_key
```

## What NVMe is

The nonvolatile memory express (NVMe) protocol is a transport protocol used for accessing nonvolatile storage media.

NVMe over Fabrics (NVMeoF) is a specification-defined extension to NVMe that enables NVMe-based communication over connections other than PCIe. This interface allows for external storage enclosures to be connected to a server.

NVMe is designed to provide efficient access to storage devices built with non-volatile memory, from flash technology to higher performing, persistent memory technologies. As such, it does not have the same limitations as storage protocols designed for hard disk drives. Flash and solid state devices (SSDs) are a type of non-volatile memory (NVM). NVM is a type of memory that keeps its content during a power outage. NVMe is a way that you can access that memory.

The benefits of NVMe include increased speeds, productivity, throughput, and capacity for data transfer. Specific characteristics include the following:

- NVMe is designed to have up to 64 thousand queues.

Each queue in turn can have up to 64 thousand concurrent commands.

- NVMe is supported by multiple hardware and software vendors
- NVMe is more productive with Flash technologies enabling faster response times
- NVMe allows for multiple data requests for each “request” sent to the SSD.

NVMe takes less time to decode a “request” and does not require thread locking in a multithreaded program.

- NVMe supports functionality that prevents bottlenecking at the CPU level and enables massive scalability as systems expand

## 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
```

## Resizing 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

| Using System Manager  | Using the CLI  |
|---|--|
| <ol style="list-style-type: none"><li>1. Click <b>Storage &gt; NVMe Namespaces</b>.</li><li>2. Hoover over the namespace you want to increase, click , and then click <b>Edit</b>.</li><li>3. Under <b>CAPACITY</b>, change the size of the namespace.</li></ol> | <ol style="list-style-type: none"><li>1. Enter the following command: <code>vserver nvme namespace modify -vserver <i>SVM_name</i> -path <i>path</i> -size <i>new_size_of_namespace</i></code></li></ol> |

## 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
```

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