# Using TLS with NFS for strong security

ONTAP 9

NetApp
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## Overview of using TLS with NFS for strong security

TLS enables encrypted network communications with equivalent security to and less complexity than Kerberos and IPsec. As an administrator, you can enable, configure, and disable TLS for strong security with NFSv3 and NFSv4.x connections using System Manager, the ONTAP CLI, or the ONTAP REST API.

NFS over TLS is available in ONTAP 9.15.1 as a public preview. As a preview offering, NFS over TLS is not supported for production workloads in ONTAP 9.15.1.

ONTAP uses TLS 1.3 for NFS over TLS connections.

### Requirements

NFS over TLS requires X.509 certificates. You can either create an install a CA-signed server certificate on the ONTAP cluster, or you can install a certificate that the NFS service uses directly. Your certificates should meet the following guidelines:

- Each certificate must be configured with the Fully Qualified Domain Name (FQDN) of the NFS server (the data LIF on which TLS will be enabled/configured) as a common name (CN).
- Each certificate must be configured with the IP address or FQDN of the NFS server (or both) as the Subject Alternative Name (SAN). If both IP address and FQDN are configured, NFS clients can connect using either the IP address or FQDN.
- You can install multiple NFS service certificates for the same LIF, but only one of them can be in use at a time as part of the NFS TLS configuration.

## Enable or disable TLS for NFS clients

You can improve the security of NFS connections by configuring NFS over TLS to encrypt all data sent over the network between the NFS client and ONTAP. This increases the security of NFS connections. You can configure this on an existing storage VM enabled for NFS.

NFS over TLS is available in ONTAP 9.15.1 as a public preview. As a preview offering, NFS over TLS is not supported for production workloads in ONTAP 9.15.1.

### Enable TLS

You can enable TLS encryption for NFS clients to increase security of data in transit.

**Before you begin**

- Refer to the requirements for NFS over TLS before you begin.
- Refer to the ONTAP manual pages for more information about the command in this procedure.

**Steps**

1. Choose a storage VM and a logical interface (LIF) on which to enable TLS.
2. Enable TLS for NFS connections on that storage VM and interface.

```
vserver nfs tls interface enable -vserver <STORAGE_VM> -lif <LIF_NAME>
-certificate-name <CERTIFICATE_NAME>
```

3. Use the `vserver nfs tls interface show` command to view the results:

```
vserver nfs tls interface show
```

**Example**

The following command enables NFS over TLS on the `data1` LIF of the `vs1` storage VM:

```
vserver nfs tls interface enable -vserver vs1 -lif data1 -certificate-name
cert_vs1
```

```
vserver nfs tls interface show
```

```
               Logical
Vserver        Interface     Address         TLS Status TLS Certificate
Name
-------------- ------------- --------------- ----------
-----------------------
vs1            data1         10.0.1.1        enabled    cert_vs1
vs2            data2         10.0.1.2        disabled   -
2 entries were displayed.
```

## Disable TLS

You can disable TLS for NFS clients if you no longer need the enhanced security for data in transit.

**Before you begin**

Refer to the ONTAP manual pages for more information about the command in this procedure.

**Steps**

1. Choose a storage VM and a logical interface (LIF) on which to disable TLS.
2. Disable TLS for NFS connections on that storage VM and interface.

```
vserver nfs tls interface disable -vserver <STORAGE_VM> -lif <LIF_NAME>
```

3. Use the `vserver nfs tls interface show` command to view the results:

```
vserver nfs tls interface show
```

**Example**

The following command disables NFS over TLS on the `data1` LIF of the `vs1` storage VM:

```
vserver nfs tls interface disable -vserver vs1 -lif data1
```

```
vserver nfs tls interface show
```

```
               Logical
Vserver        Interface     Address         TLS Status TLS Certificate
Name
-------------- ------------- --------------- ----------
------------------------
vs1            data1         10.0.1.1        disabled   -
vs2            data2         10.0.1.2        disabled   -
2 entries were displayed.
```

## Edit a TLS configuration

You can change the settings of an existing NFS over TLS configuration. For example, you can use this procedure to update the TLS certificate.

**Before you begin**

Refer to the ONTAP manual pages for more information about the command in this procedure.

**Steps**

1. Choose a storage VM and a logical interface (LIF) on which to modify the TLS configuration for NFS clients.
2. Modify the configuration. If you specify a `status` of `enable`, you also need to specify the `certificate-name` parameter. Replace values in brackets <> with information from your environment:

```
vserver nfs tls interface modify -vserver <STORAGE_VM> -lif <LIF_NAME>
-status <STATUS> -certificate-name <CERTIFICATE_NAME>
```

3. Use the `vserver nfs tls interface show` command to view the results:

```
vserver nfs tls interface show
```

**Example**

The following command modifies the NFS over TLS configuration on the `data2` LIF of the `vs2` storage VM:

```
vserver nfs tls interface modify -vserver vs2 -lif data2 -status enable
-certificate-name new_cert
```

```
vserver nfs tls interface show
```

```
               Logical
Vserver        Interface     Address         TLS Status TLS Certificate
Name
-------------- ------------- --------------- ----------
------------------------
vs1            data1         10.0.1.1        disabled   -
vs2            data2         10.0.1.2        enabled    new_cert
2 entries were displayed.
```

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