# NetApp

# Remote storage

## SANtricity software

NetApp
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# Table of Contents

# Remote storage

## Learn about the Remote Storage feature in SANtricity System Manager

If you have the Remote Storage feature, you can import data from a remote storage system to your storage array.

### What is the Remote Storage feature?

The *Remote Storage* feature allows you to import data from a remote storage system to a local E-Series storage system. The remote system can be another E-Series system or a system from another vendor. This feature is helpful when you want to streamline data migration with minimal downtime, such as during equipment upgrades.

> ⓘ     To use remote storage, this feature must be enabled in the Submodel ID (SMID).

Learn more:

- How Remote Storage works
- Remote Storage terminology
- Remote Storage requirements
- Remote Storage volume requirements

### How do I import data with this feature?

Using the Remote Storage wizard, you map a remote storage device (the source for the data import) to a target volume on the E-Series system. This wizard is available from **Storage › Remote storage**.

Learn more:

- Import remote storage
- Manage progress of the data import

# Concepts

### How Remote Storage works in SANtricity software

The Remote Storage feature allows you to import data from a remote storage system to a local E-Series storage system. This feature is helpful when you want to streamline data migration with minimal downtime, such as during equipment upgrades.

To configure the Remote Storage feature, you must set up the hardware and then use System Manager to create a remote storage object. Once this configuration is complete, the import process begins.

## Hardware setup

Use the following workflow to prepare the hardware connections.

These steps are described further in the user guide for the Remote Storage feature, which is available from the E-Series and SANtricity documentation center at Remote Storage Volumes overview, and in the Remote Storage Technical Report.

> ℹ️ SANtricity Remote Storage Volumes is currently not supported on E4000 systems.

On the local E-Series storage system:

1. Ensure that each controller has an iSCSI connection to the remote storage system. With this connection, the local E-Series system acts as an iSCSI initiator that can be set up as a host on the remote system.

2. Create a destination volume for the import operation. Ensure that the volume has a capacity that is equal to or greater than the source volume on the remote storage system, has a matching block size, and is not mapped. See Create volumes.

3. Gather the iSCSI Qualified Name (IQN) for the local E-Series system from its System Manager interface. The IQN will be used later for setting up the local E-Series system as a host on the remote storage system. In System Manager, go to: **Settings › System › iSCSI settings › Target IQN**.

On the remote storage system:

1. Set up the local E-Series system as a host on the remote system, using its IQN. Be sure to set the appropriate host type, as follows:

   - If the remote system is an E-Series model, see  Hosts and host clusters overview. Use a host type of "Factory Default."

   - If the remote system is from another vendor, select an appropriate host type based on the options available.

2. Stop all I/Os, unmount any file systems, and remove any assignments to hosts or applications for the source volume.

3. Assign the volume to the newly created local E-Series storage system host.

4. For the selected source volume, gather the following information from the remote storage system so that the import can be created:

   - iSCSI Qualified Name (IQN)

   - iSCSI IP address

   - LUN number of the source volume

## System Manager setup

Use the following workflow to create a remote storage object for the import:

1. Using the Remote Storage wizard in the System Manager interface, map a remote storage device (the source for the data import) to a target volume on the E-Series system. When you select **Finish**, the import process begins.

2. Monitor the import from the View Operations dialog or the Operations in Progress panel. If necessary, you can also pause and resume the process.

3. Optionally, break the connection between the source and target volumes when the import completes, or keep the connection for future imports.

# Learn about Remote Storage terminology in SANtricity software

Learn how the remote storage terms apply to your storage array.

| Term | Description |
|------|-------------|
| IQN | iSCSI Qualified Name (IQN) identifier, which is a unique name for an iSCSI initiator or target. |
| LUN | Logical unit number, which is used to identify a logical unit that can be presented to a host for access. |
| Remote storage system | The storage system where the data initially resides. The remote storage system can either be an E-Series model or a system from another vendor. |
| Remote storage device | The physical or logical device where the data is initially stored on the remote system. In an E-Series storage system, this is referred to as a "volume." |
| Remote storage object | An object containing information that allows the E-Series system to identify and connect to the remote storage system. This information includes the IQN and IP addresses for the remote storage system. The remote storage object represents the communication between the remote storage system and E-Series system. |
| Remote storage volume | A standard volume on the E-Series system that allows data access to a remote storage device. |
| Volume | A container in which data is stored. It is the logical component created for the host to access the data. |

# Learn about Remote Storage feature requirements in SANtricity software

Before using the Remote Storage feature, review the following requirements and restrictions.

### Supported protocols

The following protocols are supported:

- iSCSI
- IPv4

For up-to-date E-Series support and configuration information, see the NetApp Interoperability Matrix Tool.

### Hardware requirements

The E-Series storage system must include:

- Two controllers (duplex mode)
- iSCSI connections for both E-Series controllers to communicate with the remote storage system through

one or more iSCSI connections

- SANtricity OS 11.71 or greater
- Remote Storage feature enabled in the Submodel ID (SMID)

The remote system can be either an E-Series storage system or a system from another vendor. It must include:

- iSCSI-capable interfaces

**Restrictions**

The Remote Storage feature has the following restrictions:

- Mirroring must be disabled.
- Destination volume on the E-Series system must not have snapshots.
- Destination volume on the E-Series system must not be mapped to any hosts before the import is started.
- Destination volume on the E-Series system must have resource-provisioning disabled.
- Direct mappings of the remote storage volume to a host or multiple hosts is not supported.
- Web Services Proxy is not supported.
- iSCSI CHAP secrets are not supported.
- SMcli is not supported.
- VMware Datastore is not supported.
- Only one storage system in the relationship/import pair can be upgraded at a time when there is an import pair present.

## Learn about Remote Storage volume requirements in SANtricity software

Volumes used for imports must meet the requirements for size, status, and other criteria.

**Remote storage volume**

The source volume of an import is called a "remote storage volume." This volume must meet the following criteria:

- Cannot be part of another import
- Must have an online status

After the import begins, the controller firmware creates a remote storage volume in the background. Due to that background process, the remote storage volume is not manageable in System Manager and can only be used for the import operation.

After it is created, the remote storage volume is treated like any other standard volume on the E-Series system with the following exceptions:

- Can be used as proxies to the remote storage device.
- Cannot be used as candidates for other volume copies or snapshots.
- Cannot have the Data Assurance setting changed while the import is in progress.
- Cannot be mapped to any hosts, because they are reserved strictly for the import operation.

Each remote storage volume is associated with only one remote storage object; however, one remote storage object can be associated with multiple remote storage volumes. The remote storage volume is uniquely identified using a combination of the following:

- Remote storage object identifier
- Remote storage device LUN number

**Target volume candidates**

The target volume is the destination volume on the local E-Series system. The destination volume must meet the following criteria:

- Must be a RAID/DDP volume.
- Must have a capacity that is equal to or larger than the remote storage volume.
- Must have a block size that is the same as the remote storage volume.
- Must have a valid state (optimal).
- Cannot have any of the following relationships: volume copy, snapshot copies, asynchronous or synchronous mirroring.
- Cannot be undergoing any reconfiguration operations: Dynamic Volume Expansion, Dynamic Capacity Expansion, Dynamic Segment Size, Dynamic RAID Migration, Dynamic Capacity Reduction, or Defragmentation.
- Cannot be mapped to a host before the import starts (however, it can be mapped after import completes).
- Cannot have Flash Read Cached (FRC) enabled.

System Manager automatically checks these requirements as part of the Import Remote Storage wizard. Only volumes that meet all the requirements are displayed for destination volume selection.

# Manage remote storage

## Import remote storage in SANtricity System Manager

To initiate a storage import from a remote system to a local E-Series storage system, use the Import Remote Storage wizard.

**Before you begin**
- The E-Series storage system must be configured to communicate with the remote storage system.

> ⓘ Hardware configuration is described in the user guide for the Remote Storage feature, which is available from the E-Series and SANtricity documentation center at Configure hardware, and in the Remote Storage Technical Report.

- For the remote storage system, gather the following information:
  - iSCSI IQN
  - iSCSI IP addresses
  - LUN number of the remote storage device (source volume)
- For the local E-Series storage system, create or select a volume to be used for the data import. See Create volumes. The target volume must meet the following requirements:

◦ Matches the block size of the remote storage device (the source volume).

◦ Has a capacity that is equal to or larger than the remote storage device.

◦ Has a state of Optimal and is available.

For a full list of requirements, see Remote storage volume requirements.

- **Recommended:** Back up volumes on the remote storage system before starting the import process.

**About this task**

In this task, you create a mapping between the remote storage device and a volume on the local E-Series storage system. When you finish the configuration, the import begins.

> ⓘ Because many variables can impact the import operation and its completion time, we recommend that you first perform smaller "test" imports. Use these tests to ensure that all connections work as expected and that the import operation completes in an appropriate amount of time.

**Steps**

1. Select **Storage › Remote storage**.

2. Click **Import Remote Storage**.

   A wizard for importing remote storage is displayed.

3. In **Step 1a** of the Configure Source panel, enter connection information. If you want to add another iSCSI connection, click **Add another IP address** to include an additional IP address for the remote storage. When you are done, click **Next**.

   **Field details**

| Setting | Description |
|---|---|
| Name | Enter a name for the remote storage device to identify it in the System Manager interface.<br><br>A name may include up to 30 characters, and can contain only letters, numbers, and the following special characters: underscore (_), dash (-), and the hash sign (#). A name may not contain spaces. |
| iSCSI connection properties | Enter the connection properties of the remote storage device:<br><br>• **iSCSI Qualified Name (IQN)**: Enter the iSCSI IQN.<br><br>• **IP Address**: Enter the IPv4 address.<br><br>• **Port**: Enter the port number to be used for communications between the source and target devices. By default, the port number is 3260. |

   After you click **Next**, the **Step 1b** of the Configure Source panel is displayed.

4. In the **LUN** field, select the LUN number of the remote storage device to be used as the source, and then click **Next**.

The Configure Target panel opens and displays volume candidates to serve as the target for the import. Some volumes do not display in the list of candidates due to block size, capacity, or volume availability.

5. From the table, select a target volume on the E-Series storage system. If needed, use the slider to change the import priority. Click **Next**. Confirm the operation in the next dialog box by typing `continue`, and then clicking **Continue**.

   If the target volume has a capacity that is larger than the source volume, that additional capacity is not reported to the host connected to the E-Series system. To use the new capacity, you must perform a file system expansion operation on the host after the import operation completes and is disconnected.

   After you confirm the configuration in the dialog, the Review panel is displayed.

6. From the Review panel, verify that the settings are accurate, and then click **Finish** to initiate the import.

   Another dialog box opens asking if you want to initiate another import.

7. If needed, click **Yes** to create another remote storage import. Clicking **Yes** returns to **Step 1a** of the Configure Source panel, where you can select the existing configuration or add a new one. If you do not want to create another import, click **No** to exit the dialog box.

   Once the import process begins, the entire target volume is overwritten with the copied data. If the host writes any new data to the target volume during this process, that new data is propagated back to the remote device (source volume).

8. View the progress of the operation in the View Operations dialog under the Remote Storage panel.

**Results**

The time required to complete the import operation depends on the size of the remote storage system, the priority setting for the import, and the amount of I/O load on both storage systems and their associated volumes.

Once the import is complete, the local volume is a duplicate of the remote storage device.

**After you finish**

When you are ready to break the relationship between the two volumes, select **Disconnect** on the import object from the Operations In Progress view. Once the relationship is disconnected, performance of the local volume returns to normal and is no longer impacted by the remote connection.

## Manage progress of remote storage imports in SANtricity System Manager

After the import process begins, you can view and take action on its progress.

**About this task**

For each import operation, the Operations in Progress dialog displays a percentage of completion and estimated time remaining. Actions include changing the import priority, stopping and resuming operations, and disconnecting from the operation.

You can also view Operations in Progress from the Home page (**Home › Show operations in progress**).

**Steps**

1. From the Remote Storage page, select **View Operations**.

   The Operations in Progress dialog box is displayed.

2. If desired, use the links in the **Actions** column to stop and resume, change priority, or disconnect from an operation.

   - **Change Priority** — Select **Change Priority** to change the processing priority of an operation that is in progress or pending. Apply a priority to the operation and then click **OK**.

   - **Stop** — Select **Stop** to pause the copying of data from the remote storage device. The relationship between the import pair is still intact, and you can select **Resume** when you are ready to continue the import operation.

   - **Resume** — Select **Resume** to begin a stopped or failed process from where it left off. Next, apply a priority to the Resume operation, and then click **OK**. This operation does *not* restart the import from the beginning. If you want to restart the process from the beginning, you must select **Disconnect**, and then re-create the import through the Import Remote Storage wizard.

   - **Disconnect** — Select **Disconnect** to break the relationship between the source and destination volumes for an import operation that has stopped, completed, or failed.

## Modify connection settings for remote storage in SANtricity System Manager

You can edit, add, or delete connection settings for any remote storage configuration through the View/Edit Settings option.

**About this task**

Making changes to connection properties will affect in-progress imports. To avoid disruptions, only make changes to connection properties when imports are not running.

**Steps**

1. Select **Storage › Remote storage**.

2. From the list, select the remote storage object that you want to modify.

3. Click **View/Edit Settings**.

   The Remote Storage Settings dialog box is displayed.

4. Click the **Connection Properties** tab.

   The configured IP address and port settings for the remote storage import are displayed.

5. Perform one of the following actions:

   - **Edit** — Click **Edit** next to the corresponding line item for the remote storage object. Enter the revised IP address and/or port information in the fields.

   - **Add** — Click **Add**, and then enter the new IP address and port information in the fields provided. Click **Add** to confirm, and then the new connection appears in the list of remote storage objects.

   - **Delete** — Select the desired connection from the list and then click **Delete**. Confirm the operation by typing `delete` in the provided field and then click **Delete**. The connection is removed from the list of remote storage objects.

6. Click **Save**.

   The modified connection settings are applied to the remote storage object.

## Remove a remote storage object in SANtricity System Manager

After an import completes, you can remove a remote storage object if you no longer want data copied between the local and remote devices.

**Before you begin**

Make sure that no imports are associated with the remote storage object you plan to remove.

**About this task**

When you remove a remote storage object, connections between the local and remote devices are removed.

**Steps**

1. Select **Storage › Remote storage**.

2. From the list, select the remote storage object that you want to remove.

3. Click **Remove**.

   The Confirm Remove Remote Storage Connection dialog box is displayed.

4. Confirm the operation by typing `remove` and then clicking **Remove**.

   The selected remote storage object is removed.

# Remote storage FAQ for SANtricity System Manager

This FAQ can help if you're just looking for a quick answer to a question.

## What do I need to know before creating a remote storage connection?

To configure the Remote Storage feature, you must directly connect the remote device and target storage systems via iSCSI.

To set up the iSCSI system connection, refer to:

- Configure iSCSI ports
- Remote Storage Technical Report

## Why am I being prompted to remove my remote volumes?

When it reaches its maximum number of remote volumes, the storage system automatically detects any unused remote volumes and prompts you to remove them.

There are a few cases where the unused remote volumes are not cleaned up during the creation process. Before starting any additional import operations, verify that your systems are optimal and network connections are stable.

## Why don't I see all my volumes on my destination array?

When configuring an import for the Remote Storage feature, you might notice that some volumes do not appear in the list of target candidates due to block size, capacity, or volume availability.

To appear in the list, volume candidates must have:

- Capacity that is equal to or larger than the remote volume.
- Block size that is the same as the remote volume.
- Current status of Optimal.

Volumes candidates are excluded from the list if they have:

- Any of the following relationships: volume copy, snapshot, or mirroring.
- Reconfiguration operation in progress.
- Mapping to another device (host or host cluster).
- Read flash cache enabled.

## What do I need to know about the remote volume in an import?

When using the Remote Storage feature, be aware that the remote volume is the source where the data originates from.

When the import is in progress, the data is transferred from the remote volume to the target volume on the destination storage system. These two volumes must have a matching block size.

## What do I need to know before starting a remote storage import?

The Remote Storage feature allows you to copy data from a remote storage system to a volume on a local E-Series storage system. Before using this feature, review the following guidelines.

### Configuration

Before you create the remote storage import, you must complete the following actions and verify the following conditions:

- Ensure that each controller of the local E-Series storage system has an iSCSI connection to the remote storage system.
- On your local E-Series storage system, create a target volume for the import operation. Ensure that the volume has a capacity that is equal to or greater than the source volume, has a block size that matches the source volume, and is not mapped. See Create volumes.
- Set up the local E-Series storage system as a host on the remote system using its iSCSI Qualified Name (IQN). You can view the IQN from **Settings › System › iSCSI settings › Target IQN**. Also, be sure to set the appropriate host type based on the system being used.
- Stop all I/Os, unmount any file systems, and remove any assignments to hosts or applications for the selected volume on the remote storage system.
- Assign the volume to the remote storage system to the newly created local E-Series storage system host.
- Gather the following information from the remote storage system so that the import can be created:
  - iSCSI Qualified Name (IQN)
  - iSCSI IP address
  - The LUN number of the remote storage device, where the source data originates
- Once the import process begins, the entire local destination volume is overwritten with the copied data. Any new data written to the local destination volume is propagated to the volume on the remote storage device

after the import is created. Therefore, we recommend that you back up volumes on the remote storage system before starting the import process.

## Import process

The following steps outline the import process.

1. Access the System Manager interface, and then go to the **Remote Storage** page. Select **Import** to start a new import creation. For detailed instructions, see Import remote storage.

   If you want to perform an offline import, do not map the destination volume until after the import completes.

2. Monitor the progress of the import.

   Once the import starts, the target volume can then be mapped. The time required to complete the import operation depends on the size of the remote storage device (source volume), the priority setting for the import, and the amount of I/O load on both storage systems and their associated volumes.

   After import completion, the target volume is a duplicate of the source.

3. When you are ready to break the mapping relationship, perform a **Disconnect** on the import object from the **Operations In Progress** panel.

Once the import is disconnected, performance of the local destination returns to normal and is no longer impacted by the remote connection.

## Restrictions

The Remote Storage feature has the following restrictions:

- Mirroring must be disabled.
- Destination volume on the E-Series system must not have snapshots.
- Destination volume on the E-Series system must not be mapped to any hosts before the import is started.
- Destination volume on the E-Series system must have resource-provisioning disabled.
- Direct mappings of the remote storage volume to a host or multiple hosts is not supported.
- Web Services Proxy is not supported.
- iSCSI CHAP secrets are not supported.
- SMcli is not supported.
- VMware Datastore is not supported.
- Only one storage system in the relationship/import pair can be upgraded at a time when there is an import pair present.

## Additional information

Further information for the Remote Storage feature is available from the Remote Storage Technical Report.