



# Host port protocol

## E-Series Systems

NetApp  
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# Host port protocol

## Requirements for changing the E5700 host port protocol

Before converting the host port protocol in the E5700, review the requirements.

### Host ports you can change



Only the optical base ports on an E5700 controller are able to be converted.

The following figure shows the E5700 with its SFP+ (optical) baseboard host ports (1) and the optional two IB HIC ports (2).



### Requirements

- You must schedule a downtime maintenance window for this procedure.
- You must stop host I/O operations when you perform the conversion, and you will not be able to access data on the storage array until you have successfully completed the conversion.
- You must use out-of-band management. (You cannot use in-band management to complete this procedure.)
- You have obtained the necessary hardware for the conversion. Your NetApp Sales Representative can help you determine what hardware you need and help you order the correct parts.
- If you are attempting to change the baseboard host ports of your storage array, and it currently uses dual-protocol (also referred to as *unified*) SFP transceivers that you purchased from NetApp, you do not need to change your SFP transceivers.
- Make sure that the dual-protocol SFP transceivers support both FC (at 4 Gbps, or 16 Gbps) and iSCSI (at 10 Gbps), but they do not support 1 Gbps iSCSI. See [Step 1: Determine whether you have dual-protocol SFPs](#) to determine what type of SFP transceivers are installed.

### Considerations for changing the host protocol

The considerations for changing the host protocol depend on the starting and ending protocols of the baseboard host ports and the HIC ports.

If you use a Mirroring feature or the Data Assurance (DA) feature, you must understand what happens to these features when you change the host port protocol.



The following considerations apply only if you are converting a storage array that has already been in use. These considerations do not apply if you are converting a new storage array that does not yet have hosts and volumes defined.

## Converting from FC to iSCSI

- Asynchronous Mirroring requires both the local storage array and the remote storage array to use the same protocol.
  - If you are currently using Asynchronous Mirroring through the baseboard, you must deactivate Asynchronous Mirroring relationships using those ports before applying the feature pack.
  - Refer to the online help for SANtricity System Manager to delete all mirror consistency groups and remove all mirrored pairs from the local and remote storage arrays. In addition, follow the instructions in the online help to deactivate Asynchronous Mirroring.



If your configuration contains SAN Boot hosts connected to the FC baseboard ports, check the [NetApp Interoperability Matrix](#) tool to ensure that the configuration is supported on iSCSI. If it is not, you cannot convert the host protocol to iSCSI.

- The Synchronous Mirroring feature is not supported for iSCSI.
  - If you are currently using Synchronous Mirroring relationships via the baseboard ports, you must deactivate those Synchronous Mirroring relationships.
  - Refer to the online help for SANtricity System Manager to remove all synchronous mirrored pairs, which removes mirror relationships on the local storage array and on the remote storage array. In addition, follow the instructions in the online help to deactivate Synchronous Mirroring.



If you do not deactivate Synchronous Mirroring relationships before converting to iSCSI, your system will lose data access and data loss might occur.

## Converting from iSCSI to FC

- Asynchronous Mirroring requires both the local storage array and the remote storage array to use the same protocol. If you are currently using Asynchronous Mirroring with the baseboard ports, you must deactivate Asynchronous Mirroring before changing the protocol.
- Refer to the online help for SANtricity System Manager to delete all mirror consistency groups and remove all mirrored pairs from the local and remote storage arrays. In addition, follow the instructions in the online help to deactivate Asynchronous Mirroring.

## Converting IB-iSER to/from IB-SRP

- You do not have to make any changes to your hardware when you convert from/to iSER to SRP.
- The Data Assurance (DA) feature is not supported for SRP.
- The DA feature is not supported for IB-SRP. If you are currently using this feature via the IB-HIC and you want to convert those ports from iSER to SRP, you must permanently disable DA on all volumes. Refer to the online help for SANtricity System Manager to change the settings for a volume to permanently disable the data assurance setting.



After it has been disabled, DA cannot be re-enabled on the volume.

- Confirm the following:
  - SANtricity System Manager is accessible via a web browser.
  - The storage system is running SANtricity OS (controller firmware) version 08.40.11.00 or later.

## Mirroring operations need same host protocol

Mirroring operations are not affected if the host ports being used for mirroring keep the same protocol after you apply the feature pack. Even so, before applying the feature pack, you should confirm that all mirror consistency groups are synchronized. After applying the feature pack, you should test the communication between the local storage array and the remote storage array. Refer to the online help for SANtricity System Manager if you have questions on how to do this.



Asynchronous and synchronous mirroring are not supported for NVMe over Fabrics. To disable Asynchronous and Synchronous mirroring, you can use the `disable storageArray feature=asyncMirror` or `disable storageArray feature=syncMirror` commands through the command line interface. Refer to the [Disable storage array feature](#) mirroring commands under the CLI Command Reference Online Help for more information on how to disable mirroring.

## Change E5700 host protocol

For an E5700 storage array, you can convert baseboard host ports as follows:

- Fibre Channel (FC) to iSCSI
- iSCSI to FC
- iSER to InfiniBand (IB)
- SRP to IB
- NVMe to IB
- NVMe to RoCE

### Step 1: Determine whether you have dual-protocol SFPs

Use SANtricity System Manager to determine what type of SFP transceivers you have. Because these SFPs can be used with both FC and iSCSI protocols, they are referred to as *dual-protocol* or *unified* SFPs.

If your current SFPs support data rates of 16 Gbps and 10 Gbps, you can continue to use them after converting the host port protocol.

#### Steps

1. From SANtricity System Manager, select **Support**.
2. Select the **Support Center** tile.
3. On the Support Resources tab, locate and select the **Storage Array Profile** link.
4. Type **SFP** in the text box, and click **Find**.
5. For each SFP listed in the Storage Array Profile, locate the entry for **Supported data rate(s)**.

|                         |                                  |
|-------------------------|----------------------------------|
| SFP status:             | Optimal                          |
| Attached to:            | Host-side of controller B        |
| Location:               | Unknown                          |
| Supported data rate(s): | 16 Gbps, 10 Gbps, 8 Gbps, 4 Gbps |
| Link length:            | Short                            |
| Connector:              | LC                               |
| Transmitter type:       | Shortwave Laser w/o OFC          |
| Transmission media:     | TM Multi-mode 62.5m (M6)         |
| IEEE company ID:        | 00 17 6a                         |
| Revision:               | Not Available                    |
| Part number:            | AFBR-57F5UM2                     |
| Serial number:          | AA1317J14X7                      |
| Vendor:                 | AVAGO                            |
| Date of manufacture:    | 4/28/13                          |

6. Refer to the table to determine whether you can reuse the SFPs, as follows:

| Supported data rate(s)   | SFP type      | Supported protocol  |
|--------------------------|---------------|---|
| 16 Gbps, 10 Gbps, 4 Gbps | Dual-protocol | <ul style="list-style-type: none"> <li>• <b>FC:</b> 16 Gbps, 4 Gbps</li> <li>• <b>iSCSI:</b> 10 Gbps</li> </ul> |
| 10 Gbps                  | 10 Gbps       | iSCSI only  |
| 16 Gbps, 8 Gbps, 4 Gbps  | 16 Gbps       | FC only   |

- If you have dual-protocol SFPs, you can continue using them after you convert the protocol.



The dual-protocol SFPs do not support 1 Gb iSCSI. If you are converting host ports to iSCSI, be aware that the dual-protocol SFPs support only a 10 Gb link to the connected port.

- If you have 16 Gbps SFPs, and you are converting host ports to iSCSI, you must remove the SFPs and replace them with dual-protocol or 10 Gbps SFPs after converting the protocol. As needed, you can also use 10 Gbps iSCSI copper by using a special Twin-Ax cable with SFPs.



8Gbps FC SFPs are NOT supported in the E28xx or E57xx controllers. ONLY 16Gbps and 32 Gbps FC SFPs are supported.

- If you have 10 Gbps SFPs, and you are converting host ports to FC, you must remove the SFPs from these ports and replace them with dual-protocol or 16 Gbps SFPs after converting the protocol.

## Step 2: Obtain the feature pack

To obtain the feature pack, you need the serial number from the controller shelf, a Feature Activation Code, and the Feature Enable Identifier for the storage array.

### Steps

1. Locate the serial number.

- a. From SANtricity System Manager, select **Support > Support Center**.
- b. With the **Support Resources** tab selected, scroll to the **View top storage array properties** section.
- c. Locate the **Chassis Serial Number**, and copy this value to a text file.

#### View top storage array properties

|   |                                  |
|---|----------------------------------|
| Storage array world-wide identifier (ID): | 600A0980006CEF9B00000000574DB18C |
| Chassis serial number:                    | 1142FG00061                      |
| Number of shelves:                        | 2                                |
| Number of drives:                         | 41                               |
| Drive media types:                        | HDD                              |
| Number of controllers:                    | 2                                |
| Controller board ID:                      | 2806                             |

2. Locate the **feature pack submodel ID**.
  - a. From the SANtricity System Manager, select **Support**.
  - b. Select the **Support Center** tile.
  - c. On the Support Resources tab, locate and select the **Storage Array Profile** link.
  - d. Type **feature pack submodel ID** in the text box, and click **Find**.
  - e. Locate the feature pack submodel ID for the starting configuration.



## Storage Array Profile



Feature pack submodel ID



Find

Results: 1 of 1

Feature pack submodel ID: 318

### Additional feature information

Snapshot groups allowed per base volume (see note below): 4  
Volume assignments per host or host cluster: 256

Note: If a volume is a member of a snapshot consistency group, that membership (member volume) counts against both th

### FIRMWARE INVENTORY

#### Storage Array

Report Date: 2/13/17 4:56:33 PM UTC  
Storage Array Name: LDAPandCLI-Cfg04-Arapaho  
Current SANtricity OS Software Version: 88.40.39.74.001  
Management Software Version: 11.40.0010.0051  
Controller Firmware Version: 88.40.39.74  
Supervisor Software Version: 88.40.39.74  
IOM (ESM) Version: 81.40.0G00.0006  
Current NVSRAM Version: N280X-840834-402  
Staged SANtricity OS Software Version: None  
Staged NVSRAM Version: None

- Using the feature pack submodel ID, locate the corresponding Controller submodel ID for the starting configuration and find the Feature Activation Code for the desired ending configuration within the table below. Then, copy that Feature Activation Code to a text file.



Baseboard ports are disabled when running an NVMe protocol on the HIC.



If you are not using the IB HIC, you can ignore the *HIC Ports* column in the following tables:

### Encryption Capable Feature Activation Codes (Baseboard Port Only Conversions)

| Starting Configuration |                       | Ending Configuration   |                       |                         |
|------------------------|-----------------------|------------------------|-----------------------|-------------------------|
| Controller submodel ID | Ports to Convert      | Controller Submodel ID | Ports Converted To    | Feature Activation Code |
| 360                    | FC baseboard ports    | 362                    | iSCSI baseboard ports | SGL-2SB-ZEX13           |
| 362                    | iSCSI baseboard ports | 360                    | FC baseboard ports    | 5GI-4TB-ZW3HL           |

### Encryption Capable Feature Activation Codes

| Starting configuration |                 |           | Ending configuration   |                 |           |                         |
|------------------------|-----------------|-----------|------------------------|-----------------|-----------|-------------------------|
| Controller Submodel ID | Baseboard Ports | HIC Ports | Controller Submodel ID | Baseboard Ports | HIC Ports | Feature Activation Code |



| Encryption Capable Feature Activation Codes |       |      |     |               |                      |               |
|---|-------|------|-----|---------------|----------------------|---------------|
| 360   | FC    | iSER | 361 | FC            | SRP                  | UGG-XSB-ZCZKU |
|   |       |      | 362 | iSCSI         | iSER                 | SGL-2SB-ZEX13 |
|   |       |      | 363 | iSCSI         | SRP                  | VGN-LTB-ZGFCT |
|   |       |      | 382 | Not Available | NVMe/IB              | KGI-ISB-ZDHQF |
|   |       |      | 403 | Not Available | NVMe/RoCE or NVMe/FC | YGH-BHK-Z8EKB |
| 361   | FC    | SRP  | 360 | FC            | iSER                 | JGS-0TB-ZID1V |
|   |       |      | 362 | iSCSI         | iSER                 | UGX-RTB-ZLBPV |
|   |       |      | 363 | iSCSI         | SRP                  | 2G1-BTB-ZMRYN |
|   |       |      | 382 | Not Available | NVMe/IB              | TGV-8TB-ZKTH6 |
|   |       |      | 403 | Not Available | NVMe/RoCE or NVMe/FC | JGM-EIK-ZAC6Q |
| 362   | iSCSI | iSER | 360 | FC            | iSER                 | 5GI-4TB-ZW3HL |
|   |       |      | 361 | FC            | SRP                  | EGL-NTB-ZXKQ4 |
|   |       |      | 363 | iSCSI         | SRP                  | HGP-QUB-Z1ICJ |
|   |       |      | 383 | Not Available | NVMe/IB              | BGS-AUB-Z2YNG |
|   |       |      | 403 | Not Available | NVMe/RoCE or NVMe/FC | 1GW-LIK-ZG9HN |

| Encryption Capable Feature Activation Codes |               |         |     |               |                      |               |
|---|---------------|---------|-----|---------------|----------------------|---------------|
| 363   | iSCSI         | SRP     | 360 | FC            | iSER                 | SGU-TUB-Z3G2U |
|   |               |         | 361 | FC            | SRP                  | FGX-DUB-Z5WF7 |
|   |               |         | 362 | iSCSI         | SRP                  | LG3-GUB-Z7V17 |
|   |               |         | 383 | Not Available | NVMe/IB              | NG5-ZUB-Z8C8J |
|   |               |         | 403 | Not Available | NVMe/RoCE or NVMe/FC | WG2-0IK-ZI75U |
| 382   | Not Available | NVMe/IB | 360 | FC            | iSER                 | QG6-ETB-ZPPPT |
|   |               |         | 361 | FC            | SRP                  | XG8-XTB-ZQ7XS |
|   |               |         | 362 | iSCSI         | iSER                 | SGB-HTB-ZS0AH |
|   |               |         | 363 | iSCSI         | SRP                  | TGD-1TB-ZT5TL |
|   |               |         | 403 | Not Available | NVMe/RoCE or NVMe/FC | IGR-IIK-ZDBRB |
| 383   | Not Available | NVMe/IB | 360 | FC            | iSER                 | LG8-JUB-ZATLD |
|   |               |         | 361 | FC            | SRP                  | LGA-3UB-ZBAX1 |
|   |               |         | 362 | iSCSI         | iSER                 | NGF-7UB-ZE8KX |
|   |               |         | 363 | iSCSI         | SRP                  | 3GI-QUB-ZFP1Y |
|   |               |         | 403 | Not Available | NVMe/RoCE or NVMe/FC | 5G7-RIK-ZL5PE |

| Encryption Capable Feature Activation Codes |               |                      |     |               |         |               |
|---|---------------|----------------------|-----|---------------|---------|---------------|
| 403   | Not Available | NVMe/RoCE or NVMe/FC | 360 | FC            | iSER    | BGC-UIK-Z03GR |
|   |               |                      | 361 | FC            | SRP     | LGF-EIK-ZPJRX |
|   |               |                      | 362 | iSCSI         | iSER    | PGJ-HIK-ZSIDZ |
|   |               |                      | 363 | iSCSI         | SRP     | 1GM-1JK-ZTYQX |
|   |               |                      | 382 | Not Available | NVMe/IB | JGH-XIK-ZQ142 |

| Non-Encryption Feature Activation Codes (Baseboard Port Only Conversions) |                       |                        |                       |                         |
|---|-----------------------|------------------------|-----------------------|-------------------------|
| Starting configuration  |                       | Ending Configuration   |                       |                         |
| Controller submodel ID  | Ports to Convert      | Controller Submodel ID | Ports Converted To    | Feature Activation Code |
| 365   | FC baseboard ports    | 367                    | iSCSI baseboard ports | BGU-GVB-ZM3KW           |
| 367   | iSCSI baseboard ports | 366                    | FC baseboard ports    | 9GU-2WB-Z503D           |

| Non-Encryption Feature Activation Codes |                 |           |                        |                 |           |                         |
|---|-----------------|-----------|------------------------|-----------------|-----------|-------------------------|
| Starting configuration                  |                 |           | Ending configuration   |                 |           |                         |
| Controller submodel ID                  | Baseboard ports | HIC ports | Controller submodel ID | Baseboard ports | HIC ports | Feature Activation Code |

| Non-Encryption Feature Activation Codes |       |      |     |               |                      |               |
|---|-------|------|-----|---------------|----------------------|---------------|
| 365                                     | FC    | iSER | 366 | FC            | SRP                  | BGP-DVB-ZJ4YC |
|   |       |      | 367 | iSCSI         | iSER                 | BGU-GVB-ZM3KW |
|   |       |      | 368 | iSCSI         | SRP                  | 4GX-ZVB-ZNJVD |
|   |       |      | 384 | Not Available | NVMe/IB              | TGS-WVB-ZKL9T |
|   |       |      | 405 | Not Available | NVMe/RoCE or NVMe/FC | WGC-GJK-Z7PU2 |
| 366                                     | FC    | SRP  | 365 | FC            | iSER                 | WG2-3VB-ZQHLF |
|   |       |      | 367 | iSCSI         | iSER                 | QG7-6VB-ZSF8M |
|   |       |      | 368 | iSCSI         | SRP                  | PGA-PVB-ZUWMX |
|   |       |      | 384 | Not Available | NVMe/IB              | CG5-MVB-ZRYW1 |
|   |       |      | 405 | Not Available | NVMe/RoCE or NVMe/FC | 3GH-JJK-ZANJQ |
| 367                                     | iSCSI | iSER | 365 | FC            | iSER                 | PGR-IWB-Z48PC |
|   |       |      | 366 | FC            | SRP                  | 9GU-2WB-Z503D |
|   |       |      | 368 | iSCSI         | SRP                  | SGJ-IWB-ZJFE4 |
|   |       |      | 385 | Not Available | NVMe/IB              | UGM-2XB-ZKV0B |
|   |       |      | 405 | Not Available | NVMe/RoCE or NVMe/FC | 8GR-QKK-ZFJTP |

| Non-Encryption Feature Activation Codes |               |         |     |               |                      |               |
|---|---------------|---------|-----|---------------|----------------------|---------------|
| 368                                     | iSCSI         | SRP     | 365 | FC            | iSER                 | YG0-LXB-ZLD26 |
|   |               |         | 366 | FC            | SRP                  | SGR-5XB-ZNTFB |
|   |               |         | 367 | iSCSI         | SRP                  | PGZ-5WB-Z8M0N |
|   |               |         | 385 | Not Available | NVMe/IB              | KG2-0WB-Z9477 |
|   |               |         | 405 | Not Available | NVMe/RoCE or NVMe/FC | 2GV-TKK-ZIHI6 |
| 384                                     | Not Available | NVMe/IB | 365 | FC            | iSER                 | SGF-SVB-ZWU9M |
|   |               |         | 366 | FC            | SRP                  | 7GH-CVB-ZYBGV |
|   |               |         | 367 | iSCSI         | iSER                 | 6GK-VVB-ZZSRN |
|   |               |         | 368 | iSCSI         | SRP                  | RGM-FWB-Z195H |
|   |               |         | 405 | Not Available | NVMe/RoCE or NVMe/FC | VGM-NKK-ZDLDK |
| 385                                     | Not Available | NVMe/IB | 365 | FC            | iSER                 | GG5-8WB-ZBKEM |
|   |               |         | 366 | FC            | SRP                  | KG7-RWB-ZC2RZ |
|   |               |         | 367 | iSCSI         | iSER                 | NGC-VWB-ZFZEN |
|   |               |         | 368 | iSCSI         | SRP                  | 4GE-FWB-ZGGQJ |
|   |               |         | 405 | Not Available | NVMe/RoCE or NVMe/FC | NG1-WKK-ZLFAI |

| Non-Encryption Feature Activation Codes |               |                      |     |               |         |               |
|---|---------------|----------------------|-----|---------------|---------|---------------|
| 405                                     | Not Available | NVMe/RoCE or NVMe/FC | 365 | FC            | iSER    | MG6-ZKK-ZNDVC |
|   |               |                      | 366 | FC            | SRP     | WG9-JKK-ZPUAR |
|   |               |                      | 367 | iSCSI         | iSER    | NGE-MKK-ZRSW9 |
|   |               |                      | 368 | iSCSI         | SRP     | TGG-6KK-ZT9BU |
|   |               |                      | 384 | Not Available | NVMe/IB | AGB-3KK-ZQBLR |



If your controller submodel ID is not listed, contact [NetApp Support](#).

4. In System Manager, locate the Feature Enable Identifier.
  - a. Go to **Settings > System**.
  - b. Scroll down to **Add-ons**.
  - c. Under **Change Feature Pack**, locate the **Feature Enable Identifier**.
  - d. Copy and paste this 32-digit number to a text file.

Change Feature Pack

Ensure you have obtained a feature pack file from your Technical Support Engineer. After you have obtained the file, transfer it to the storage array to change your feature pack.

Feature Enable Identifier: 333030343238333030343439574DB18C

Select the feature pack file:

Current feature pack: SMID 261

**Important:** Changing a feature pack is an offline operation. Verify that there are no hosts or applications accessing the storage array and back up all data before proceeding.

Type CHANGE to confirm that you want to perform this operation.

5. Go to [NetApp License Activation: Storage Array Premium Feature Activation](#), and enter the information

required to obtain the feature pack.

- Chassis serial number
- Feature Activation Code
- Feature Enable Identifier



The Premium Feature Activation web site includes a link to “Premium Feature Activation Instructions.” Do not attempt to use those instructions for this procedure.

6. Choose whether to receive the key file for the feature pack in an email or download it directly from the site.

### Step 3: Stop host I/O

Stop all I/O operations from the host before converting the protocol of the host ports. You cannot access data on the storage array until you successfully complete the conversion.

This task applies only if you are converting a storage array that has already been in use.

#### Steps

1. Ensure that no I/O operations are occurring between the storage array and all connected hosts. For example, you can perform these steps:
  - Stop all processes that involve the LUNs mapped from the storage to the hosts.
  - Ensure that no applications are writing data to any LUNs mapped from the storage to the hosts.
  - Unmount all file systems associated with volumes on the array.



The exact steps to stop host I/O operations depend on the host operating system and the configuration, which are beyond the scope of these instructions. If you are not sure how to stop host I/O operations in your environment, consider shutting down the host.



**Possible data loss** — If you continue this procedure while I/O operations are occurring, the host application might lose data because the storage array will not be accessible.

2. If the storage array participates in a mirroring relationship, stop all host I/O operations on the secondary storage array.
3. Wait for any data in cache memory to be written to the drives.

The green Cache Active LED (**1**) on the back of each controller is on when cached data needs to be written to the drives. You must wait for this LED to turn off.





4. From the Home page of SANtricity System Manager, select **View Operations in Progress**.
5. Wait for all operations to complete before continuing with the next step.

## Step 4: Change the feature pack

Change the feature pack to convert the host protocol of the baseboard host ports, the IB HIC ports, or both types of ports.

### Steps

1. From SANtricity System Manager, select **Settings > System**.
2. Under **Add-ons**, select **Change Feature Pack**.



3. Click **Browse**, and then select the feature pack you want to apply.
4. Type **CHANGE** in the field.
5. Click **Change**.

The feature pack migration begins. Both controllers automatically reboot twice to allow the new feature pack to take effect. The storage array returns to a responsive state after the reboot is complete.

6. Confirm the host ports have the protocol you expect.
  - a. From SANtricity System Manager, select **Hardware**.
  - b. Click **Show back of shelf**.
  - c. Select the graphic for either Controller A or Controller B.
  - d. Select **View settings** from the context menu.
  - e. Select the **Host Interfaces** tab.
  - f. Click **Show more settings**.
  - g. Review the details shown for the baseboard ports and the HIC ports (labeled “slot 1”), and confirm that each type of port has the protocol you expect.

### What's next?

Go to [Complete host protocol conversion](#).

# Complete E5700 host protocol conversion

After converting the protocol of the host ports, perform additional steps to use the new protocol.

The steps you might need to complete depend on the starting and ending protocols of the baseboard host ports and the HIC ports.

## Complete FC to iSCSI conversion

If you previously had FC host ports and you converted to iSCSI, you might need to modify your existing configuration to support iSCSI. The following procedure is only applicable if there is no iSCSI HIC present.

### About this task

This task applies only if you are converting a storage array that has already been in use.

This task does not apply if you are converting a new storage array that does not yet have hosts and volumes defined. If you converted the host-port protocol of a new storage array, see the [Cabling procedures](#) to install cables and SFPs. Then, follow the instructions in the [Linux express configuration](#), [Windows express configuration](#), or [VMware express configuration](#) to complete the setup for each protocol.

### Steps

1. Configure the switches.

You should configure the switches used to transport iSCSI traffic according to the vendor's recommendations for iSCSI. These recommendations might include both configuration directives as well as code updates.

2. From SANtricity System Manager, select **Hardware > Configure iSCSI ports**.
3. Select the port settings.

You can set up your iSCSI network in many ways. Consult your network administrator for tips on selecting the best configuration for your environment.

4. Update the host definitions in SANtricity System Manager.



If you need instructions to add hosts or host clusters, refer to the online help for SANtricity System Manager.

- a. Select **Storage > Hosts**.
- b. Select the host to which the port will be associated, and click **View/Edit Settings**.

The Host Settings dialog box appears.

- c. Click the **Host Ports** tab.

Host Settings

Properties Host Ports

Add Delete

| Host Port               | Label | Edit |
|-------------------------|-------|------|
| 12:34:56:78:91:12:34:56 | ICT_1 |      |

Total rows: 1

Save Cancel

- d. Click **Add**, and use the **Add Host Port** dialog box to associate a new host port identifier to the host.

The length of the host port identifier name is determined by the host interface technology. FC host port identifier names must have 16 characters. iSCSI host port identifier names have a maximum of 223 characters. The port must be unique. A port number that has already been configured is not allowed.

- e. Click **Delete**, and use the **Delete Host Port** dialog box to remove (unassociate) a host port identifier.

The **Delete** option does not physically remove the host port. This option removes the association between the host port and the host. Unless you remove the host bus adapter or the iSCSI initiator, the host port is still recognized by the controller.

- f. Click **Save** to apply your changes to the host port identifier settings.

- g. Repeat these steps to add and remove any additional host port identifiers.

5. Reboot the host or perform a rescan so that the host properly discovers the LUNs.

6. Remount volumes or start using block volume.

### What's next?

Your host protocol conversion is complete. You can resume normal operations.

## Complete iSCSI to FC conversion

If you previously had iSCSI host ports and you converted to FC, you might need to modify your existing configuration to support FC. The following procedure is only applicable if no FC HIC is present.

This task applies only if you are converting a storage array that has already been in use.

This task does not apply if you are converting a new storage array that does not yet have hosts and volumes defined. If you converted the host-port protocol of a new storage array, see the [Cabling procedures](#) to install cables and SFPs. Then, follow the instructions in the [Linux express configuration](#), [Windows express configuration](#), or [VMware express configuration](#) to complete the setup for each protocol.

### Steps

1. Install the HBA utility and determine initiator WWPNs.
2. Zone the switches.

Zoning the switches enables the hosts to connect to the storage and limits the number of paths. You zone the switches using the management interface of the switches.

3. Update the host definitions in SANtricity System Manager.
  - a. Select **Storage > Hosts**.
  - b. Select the host to which the port will be associated, and click **View/Edit Settings**.

The Host Settings dialog box appears.

- c. Click the **Host Ports** tab.

| Host Port               | Label | Edit |
|-------------------------|-------|------|
| 12:34:56:78:91:12:34:56 | ICT_1 |      |

Total rows: 1

- d. Click **Add**, and use the **Add Host Port** dialog box to associate a new host port identifier to the host.

The length of the host port identifier name is determined by the host interface technology. FC host port identifier names must have 16 characters. iSCSI host port identifier names have a maximum of 223 characters. The port must be unique. A port number that has already been configured is not allowed.

- e. Click **Delete**, and use the **Delete Host Port** dialog box to remove (unassociate) a host port identifier.

The **Delete** option does not physically remove the host port. This option removes the association between the host port and the host. Unless you remove the host bus adapter or the iSCSI initiator, the host port is still recognized by the controller.

- f. Click **Save** to apply your changes to the host port identifier settings.
  - g. Repeat these steps to add and remove any additional host port identifiers.
4. Reboot the host or perform a rescan so that the host properly discovers mapped storage.
  5. Remount volumes or start using block volume.

### What's next?

Your host protocol conversion is complete. You can resume normal operations.

## Complete conversion for IB-iSER to/from IB-SRP, NVMe over IB, NVMe over RoCE, or NVMe over FC

After you apply the feature pack key to convert the protocol used by your InfiniBand iSER HIC port to/from SRP, NVMe over InfiniBand, NVMe over RoCE, or NVMe over Fibre Channel, you need to configure the host to use the appropriate protocol.

### Steps

1. Configure the host to use the SRP, iSER, or NVMe protocol.

For step-by-step instructions on how to configure the host to use SRP, iSER, or NVMe, see the [Linux express configuration](#).

2. To connect the host to the storage array for an SRP configuration, you must enable the InfiniBand driver stack with the appropriate options.

Specific settings might vary between Linux distributions. Check the [NetApp Interoperability Matrix](#) for specific instructions and additional recommended settings for your solution.

### What's next?

Your host protocol conversion is complete. You can resume normal operations.

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