

ATTO XstreamCORE® ET 8200

40-Gigabit 2-Port Ethernet to 12-Gigabit 4-Port SAS Storage Controller

ATTO XstreamCORE® ET 8200T

40-Gigabit 2-Port Ethernet to 12-Gigabit 4-Port SAS Tape Controller

Installation and Operation Manual



The Power Behind the Storage

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1 ATTO XstreamCORE 8200 Overview

The ATTO XstreamCORE ET 8200/8200T is an accelerated protocol conversion appliance that connects multiple shelves of SAS and SATA JBOD, JBOF or RAID storage and SAS tape storage and virtualizes it to an Ethernet SAN Connection.

The ATTO XstreamCORE ET 8200/8200T allows IT departments to design storage systems with the flexibility to use standard interface off-the-shelf SAS storage hardware with increased bandwidth and low latency levels that improve performance and response. As a Data Center building block, the ET 8200/8200T allows IT managers to build their storage solution on their terms, avoiding vendor lock-in

with modularity at each layer. Use the ET 8200/8200T to aggregate, virtualize and share storage with the knowledge that it has undergone qualifications with industry leading storage and network infrastructure products. Integrate the ET 8200/8200T into IT infrastructures to provide lower operational costs through the use of tools like Drive Map Director™ and XstreamVIEW™.

ATTO XstreamCORE ET 8200/8200T features, benefits

The ATTO XstreamCORE ET 8200/8200T is a 40-Gigabit Ethernet to 12-Gigabit SAS storage controller configured with two independent 40Gb Ethernet ports and four 12Gb x4 mini-SAS connectors.

Designed to integrate industry-leading performance and SAN capabilities into the future generation of storage solutions, the XstreamCORE ET 8200/8200T uses a high-performance architecture suited for OEMs looking to incorporate SAS or SATA disk, tape or flash storage devices in their Ethernet network. The 8200/8200T passes through raw drives to host operating systems.

- Two independent 40Gb Ethernet QSFP+ ports which auto-negotiate to 40Gb or 10Gb Ethernet
- Dual Power Supplies
- Integrated xCORE Acceleration Processor
- Data Mover technology (not supported on the ET 8200T)
- Integrated eCORE Offload Processor

- Supports iSCSI Extensions for RDMA (iSER)
- Supports accelerated iSCSI over TCP/IP
- Supports IPv4 and IPv6 connections
- Four independent 12Gb SAS/SATA x4 mini-SAS HD connectors which auto-negotiate to 3Gb, 6Gb or 12Gb SAS and 3Gb or 6Gb SATA
- Automatic LUN Mapping & Management
- Patented Drive Map Director™ reduces operating expense by auto-configuring storage
- XstreamVIEW™ integrated management console for remote configuration, management and diagnostic capabilities
- Supports SAS and SATA SSDs (not supported on the ET 8200T)
- Supports SAS and SATA hard disk drives (not supported on the ET 8200T)
- Supports SAS tape drives & SATA optical drives
- SpeedWrite™ technology improves write performance to tape drives by up to 20% over SAS tape drives connected via SAS HBAs

Performance note: *The XstreamCORE ET 8200/8200T supports both iSER and iSCSI over Ethernet. iSER runs over RDMA eliminating the TCP/IP stack so it is much more efficient and provides higher throughput with deterministic latency. iSCSI runs over TCP/IP and will have higher latency with slower performance than iSER.*

ATTO XstreamCORE ET 8200/8200T

The ATTO XstreamCORE ET 8200/8200T is a high-performance storage controller that adds 40-Gigabit Ethernet connectivity to 12-Gigabit SAS or SATA storage devices.



The XstreamCORE ET 8200/8200T is available in an industry-standard 1U form factor and includes rack-mount hardware for easy integration into 19" racks.

Dimensions

Width: 17.3 inches

Length: 9.9 inches

Height: 1.74 inches (1U)

Weight: approximately 10 pounds

Cooling and airflow

Operating temperature: 5-40 °C external

Humidity: 10-90% non-condensing

Air enters from the front and is exhausted out the connector side. Ambient air near the inlets should not exceed 40°C. The unit automatically stops operation if the temperature goes beyond this threshold.

CAUTION *Do not block the enclosure's vents. The XstreamCORE does not allow data transfer if overheating occurs.*

Power

The ET 8200/8200T features two hot swappable power supplies and can be operated with only a single power supply inserted. Each power supply has a standard IEC320 power receptacle and cooling fan. The power requirements of the ATTO XstreamCORE ET 8200/8200T plus the power draw of other equipment in the rack must not overload the supply circuit and or wiring of this rack.

Input voltage: 120v operation – input 90-132 VAC 1A, 47-63 Hz
240v operation – input 180-264 VAC 1A, 47-63 Hz.

Ethernet data ports

The dual independent 40Gb/s Ethernet ports connect the XstreamCORE ET 8200/8200T to Ethernet hosts using optical QSFP+ connectors or QSFP direct connect copper cables. Make sure all cables are anchored securely at both ends with the proper connectors.



Note

Ethernet data ports will connect an uplink to a fabric switch or use fan-out cables that break up the 40GbE into multiple 10GbE connections.

SAS/SATA ports

The 12Gb/s SAS/SATA connectors (16 PHYs total) connect storage devices into the Storage Area Network (SAN) using mini-SAS HD cable plug connectors.

Management ports

Management is provided using the dual 100/1000BASE-T Ethernet ports accessible from the RJ-45 connectors labeled 'Ethernet', or the RS-232 command line interface from the RJ-45 connector labeled 'Serial'.



Note

The USB 2.0 port is for service only and is not accessible to the user.

LED indicators

LED indicators can be viewed from the connector side and the front side of the XstreamCORE ET 8200/8200T.

LEDs on the connector side are:

Power Supplies: One LED for each supply. Blue indicates on and ready. Blinking blue indicates power is applied but power supply is not on. Blinking Red indicates an unplugged or failed power supply.

Ready/Alert: Bi-color shared LED lit green means ready, yellow indicates an alert condition.

Ethernet management port: The green left LED on the RJ45 connector indicates speed, while the right green LED indicates an active link/activity.

Ethernet data port: A lit green LED indicates link, and OFF means no link. Port LEDs are located below the QSFP+ connectors.

SAS/SATA device: SAS LEDs are located below the mini-SAS HD connector. A lit green LED indicates a link has been established on at least one PHY, and OFF means there are no links.

LEDs on the faceplate are:

Power Supplies: One LED for each supply (PSA and PSB). Green indicates on and ready while amber indicates an unplugged or failed supply.

 **Note** *If both power supplies are on and both LEDs are yellow at the same time, this indicates a bad status connection. Status harnesses may not be connected.*

Power: A lit green LED indicates power has been turned ON to the storage controller.

Ready: A lit green LED indicates ready and OFF to show not ready.

Alert: A lit yellow LED indicates an alert condition.

Ethernet Data Port Activity: A lit green port activity LED indicates traffic on the port, and OFF indicates no port activity.

Ethernet Data Port Speed: A bi-color port speed LED is lit as follows: Green = 40Gb/s, Yellow = 10Gb/s, and OFF = no link or 1GbE.

SAS/SATA Device Activity: A lit green LED for each SAS connector indicates port activity on at least one PHY in the connector, and OFF means no port activity.

Exhibit 1 ET 8200/8200T Connectors, LEDs and power receptacle on the connector side.

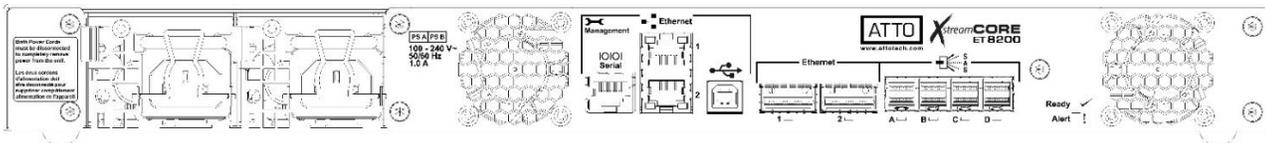


Exhibit 2 ET 8200/8200T LEDs on the faceplate.



2 Install the XstreamCORE

If you have not already completed the instructions on the Quick Start page packed with your XstreamCORE, use the following instructions to install the XstreamCORE.

Unpack the packing box; verify contents

- The XstreamCORE.
 - Record the serial number, default username, and default password located on the bottom of the unit:
S/N: _____
Default Username: _____
Default Password: _____
The username and password are needed to access XstreamVIEW, SSH, and SFTP services via the Ethernet management ports.

 **Note** *During the first login to XstreamVIEW or SSH, the XstreamCORE will prompt you to change the unit's default password.*

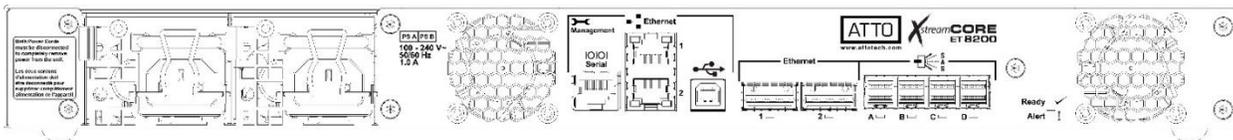
- Power cords
- "L" brackets for mounting in a 19" rack
- Ethernet cable
- RS-232 cable

Install the XstreamCORE

1. Place the XstreamCORE on a stable flat surface or install it into a standard rack.
2. If installing into a rack, attach the brackets to both sides of the XstreamCORE enclosure. Then install the XstreamCORE assembly horizontally within the rack so it does not reduce the air flow within the rack.
3. Connect the host computer by connecting the cable to Ethernet data port 1 or 2.
4. Connect target devices by connecting SAS cables to SAS connector A, B, C or D.
5. Power up the target devices.
6. Connect the Ethernet port to your network.
7. Connect the AC power cords from the XstreamCORE to the proper AC source outlets.

 **Note** *Power is automatically supplied to the ET 8200 when plugged into an AC outlet.*

Exhibit 5 XstreamCORE ET 8200/8200T, LEDs, power receptacle and ports



 **CAUTION** *The power source must be connected to a protective earth ground and comply with local electrical codes. Improper grounding may result in an electrical shock or damage to the unit. Also, be aware that this unit is powered on once a power source is connected. Make sure the power supply module is fully inserted before applying power. Failure to do so may cause injury or damage the unit.*

If you are using a rack:

1. Properly ground the XstreamCORE to the rack equipment. The earth ground connection must be maintained.
2. The power requirements plus the power draw of the other equipment in the rack must not overload the supply circuit and/or wiring of the rack.
3. Wait for the **XstreamCORE Ready LED** to light, indicating that the XstreamCORE has completed its power-on self-test sequence.

Exhibit 3 Attach rack mounting brackets to XstreamCORE

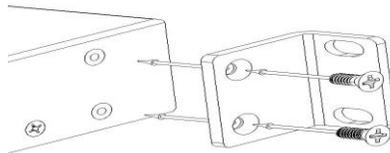
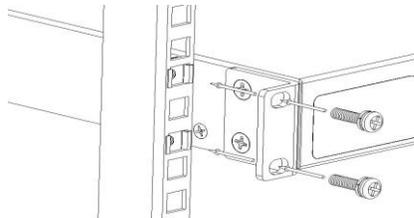
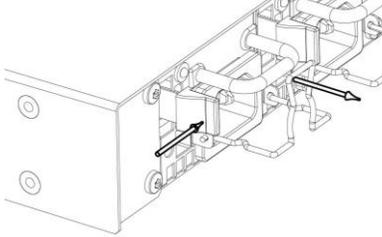


Exhibit 4 Install XstreamCORE into a rack.



Installation and Removal of Power Supply Modules

 Note **Handle and latch should be on top.**



 CAUTION **Remove the power source before removing the power supply module. Failure to do so may cause injury or damage the unit. To remove a power supply module, first remove the power cord.**

1. Press the side latch inward and pull out on the handle.
2. To install a power module, insert module until you hear the latch click.
3. Install power cord.

Discover the IP address with QuickNAV (Windows and Linux)

 Note **The XstreamCORE is initially configured with DHCP enabled. It is best if you have access to a DHCP server.**

 Note **For Linux, make sure the file permissions are set to executable after downloading.**

1. Power on your system and log in as a user with proper administrative privileges from the computer attached to the XstreamCORE Ethernet management port on the same domain.
2. Go to www.atto.com.
3. Select **Downloads** from the **Support** menu.
4. Register or log in if previously registered.
5. Select **Storage Controllers** from the product list.
6. Select your model.
7. From the table, find your Operating System.
8. Click on the entry for the QuickNAV™ utility.
9. Select a download destination and allow the download to complete. Double-click the downloaded QuickNAV™ file to install onto your operating system, and launch the program.
10. Select the network interface for QuickNAV discovery. Click **Next**.
11. Locate the XstreamCORE with the serial number recorded earlier.

Security Certificates

Certificate, Keys, and PEM file

The XstreamCORE controller uses a certificate (aka. Public key) that is provided to devices on a network to authenticate the controller to them. The HTTPS, SSH, and SFTP servers in

12. Highlight the serial number.
13. Click **Next**.

If a DHCP server is available on your network, an address is assigned automatically by the server. Note the assigned address: _____, and click on **Launch Browser**. Your browser points to the ATTO XstreamVIEW welcome screen. If you use Internet Explorer as a browser, continue on to [Internet Explorer setup](#) below. If not, continue on to [Begin Initial Configuration](#).

If you do not have a DHCP server, click on **Next**, get an IP address and subnet mask from your network administrator, type it into the area provided, and click on **Next**.

 Note **XstreamCORE supports the Google Chrome, Firefox and Microsoft Edge browsers**

14. Click on **Reboot Now**. Wait up to two minutes for the XstreamCORE Ready LED to light indicating the XstreamCORE has completed its power-on self-test sequence. Launch your browser and navigate to the IP address received from your network administrator. Your browser points to the ATTO XstreamVIEW™ welcome screen. If you use Internet Explorer as a browser, continue on to [Internet Explorer setup](#) below. If not, continue on to [Begin Initial Configuration](#).

Begin initial configuration

1. The XstreamVIEW™ interface welcome screen appears. Click on **Enter Here**.
2. Type in the user name and password.

 Note **The default user name and password values can be found on the bottom of the unit. The user name is case insensitive and the password is case sensitive. It is best practice to change the default user name and password. Refer to [Modify passwords](#). During the first login to XstreamVIEW or SSH, the XstreamCORE will prompt you to change the unit's default password. After the new password is accepted, the unit will reboot. Wait up to two minutes for the XstreamCORE Ready LED to light indicating the XstreamCORE has completed its power-on self-test sequence. Re-launch your browser and navigate to the correct IP address. Your browser points to the ATO XstreamVIEW™ welcome screen. Type in the user name and password.**

3. The XstreamVIEW™ status page appears. Continue to [Map Devices](#).

the controller expects to have access to a PEM (Privacy Enhanced Mail) file containing the keypair (certificate and its associated private key) necessary to provide access. The initial keypair PEM file has been generated by the controller. Note that the private key is only seen by the controller.

Keypair regeneration

The PEM file containing the keypair is regenerated by the controller if:

1. It expires. This will be noted in the XstreamCORE event log. Additionally, the approaching expiration of the keypair is logged one month prior to its expiration.
2. The IP configuration of an Ethernet port changes. The certificate used on the controller uses the IP configurations of the Ethernet ports (but not the DNS name of the controller). If an Ethernet port IP configuration changes, the keypair will be regenerated to reflect the change.
3. User-provided certificate attributes change.

In all cases, since it is the controller that generates the keypair, the certificate within will be self-signed. This will result in a client web browser warning advisement when a connection attempt is made to the controller.



Note

Even if an externally signed certificate is present on the XstreamCORE, a self-signed certificate will be generated to replace it if the conditions met above are met.

Uploading a keypair PEM file

If a self-signed certificate is not desirable, an externally-signed certificate and its associated private key can be uploaded to the controller. The file containing this keypair must meet several requirements:

1. It must be named httpspem.pem.
2. It must be in the PEM format.
3. The contents of the file must include both the certificate and the private key.
4. It must not be encrypted (if generated via OpenSSL's "req" command, specify "-nodes").
5. The private key must be an RSA private key.
6. The certificate must be SHA256 signed.
7. The certificate must have the same attributes as the controller displays in the "get HttpsCertParams" command (see below).

The file format should appear as follows (note that the actual contents have been abbreviated):

```
-----BEGIN PRIVATE KEY-----
MIIEvgIBADANBgkqhkiG9w0BAQEFAASCBAgAwAgEAAoIBA
QDaJU8liMAIZREs
... <snip>
uU0m3t4sxoIF5WarwTYQWKE
-----END PRIVATE KEY-----
-----BEGIN CERTIFICATE-----
MIIDljCCAqgAwIBAgIJANYizZ6isr/gMA0GCSqGSIb3DQEBcUA
MDoxCzAJBgNV
... <snip>
```

```
/GAqjDXDoFDpHrHGEXtOi9AP1VKxREo+J/L9eb+CuOE/EPFaHIM
=
-----END CERTIFICATE-----
```

Keypairs may be uploaded via the "Certificate Management" page of the XstreamVIEW interface.

CLI commands available for the user

1. HTTPSCertInfo: This command displays certificate information to the console, including IP addresses associated with the keypair PEM file, the expiration date, attributes, and algorithms used. Example output:

Certificate:

Data:

Version: 3 (0x2)

Serial Number:

d6:22:cd:9e:a2:b2:bf:e0

Signature Algorithm: sha256WithRSAEncryption

Issuer: ST = NY, L = Getzville, O = AttoTechnology

Validity

Not Before: Feb 4 18:32:13 2019 GMT

Not After : Feb 4 18:32:13 2020 GMT

Subject: ST = NY, L = Getzville, O = AttoTechnology

X509v3 extensions:

X509v3 Basic Constraints:

CA:FALSE

X509v3 Key Usage:

Digital Signature, Non Repudiation, Key Encipherment

X509v3 Subject Alternative Name:

IP Address:10.40.0.31

```
-----BEGIN CERTIFICATE-----
```

```
MIIDljCCAqgAwIBAgIJANYizZ6isr/gMA0GCSqGSIb3DQEBcUA
```

```
MDoxCzAJBgNV
```

```
<snip>
```

```
-----END CERTIFICATE-----
```

2. HttpsCertParams: Displays and configures the certificate's attributes, including State (ST), Locality (L), and Organization (O) attributes (as shown in the example above). These attributes may also be set via the Certificate Management page in the XstreamVIEW web interface.

Exhibit 6 Certificates and PEM file upload – useful for setting certificate attributes or uploading a PEM file if a self-signed certificate is not desirable.



3 Configure the XstreamCORE

To configure the XstreamCORE, use the ATTO XstreamVIEW™ System Manager GUI. Default values are appropriate for most configurations, but may be modified. In-band configuration is also available, contact ATTO support for details.

The best way to access the XstreamCORE to view and change settings is to use ATTO XstreamVIEW™ System Manager, a browser-based graphical interface. Other methods are also available. Refer to [Interface Options](#).

Help is available from within XstreamVIEW™ by clicking on the text indicating each setting. For more information on any of these parameters, refer to the specific CLI command in [Command explanations](#).

To change mapping, refer to [Map Devices](#).

To use Email notification or SNMP, refer to [Remote Monitoring, Management](#).

You may make changes to several pages before going to the Restart page and restarting the XstreamCORE to save the changes.

Preliminary steps

1. If you are not already in the XstreamVIEW™ interface, type the IP address of your XstreamCORE in a standard browser as found in [Using XstreamVIEW™ System Manager](#), click **Enter Here**, type in your user name and password, and click **OK**.
2. The Status page appears. Check default settings to ensure they are appropriate for your configuration. Use the individual pages listed on the side menu to make setting changes or to configure features.



Port configurations

1. Follow the [Preliminary steps](#).

2. There are two different ways to get to a specific data port/management port page:
 - a) Select the port you wish to configure from the banner at the top of the home page. This will take you directly to that port's configuration page.
 - b) Select the "Ethernet" page from the left menu. This takes you to a page with tabs for each Ethernet port.
3. Select the parameters you wish to change.
4. Click **Submit**.
5. If you have completed all changes for this session, go to the Restart page and restart the Ethernet storage controller.

Modify passwords

1. Follow the [Preliminary steps](#).
2. From the side menu select **Controller**. The storage controller Configuration page is displayed.

The Administrator user name that you are currently logged in with and the current read only user name, if present, are displayed in their text boxes.

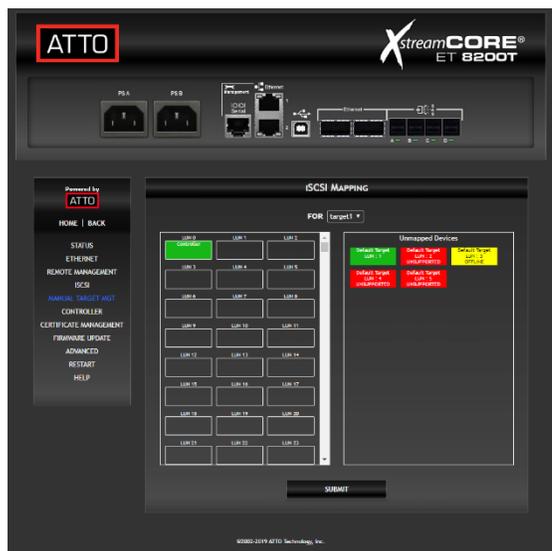
3. Enter the **Administrator (Admin) password** where indicated.
4. Enter appropriate information into the **New Admin Password, Confirm New Admin Password** or **New Read Only Password** and **Confirm New Read Only Password** text boxes.
5. Click **Submit**.
6. If you have completed all changes for this session, go to the **Restart** page and restart the XstreamCORE.

A screenshot of the "Usernames and Passwords" configuration page in the ATTO XstreamVIEW™ System Manager GUI. The page has a dark background with white text. It contains several input fields for passwords and usernames. The "Admin Username" field is pre-filled with "root". The "Read Only Username" field is pre-filled with "user". There are buttons for "Submit" and "Cancel" at the bottom right.

4 Map Devices

After getting an IP address and logging into the ATTO XstreamVIEW™ System Manager, you have options to map devices so that the XstreamCORE can provide access to storage on your network.

The ATTO XstreamCORE allows SAS/SATA devices to participate in an Ethernet fabric. Ethernet and SAS/SATA use different models to address devices. The XstreamCORE translates between these addressing models.



XstreamCORE mapping

On the network, the XstreamCORE presents a number of targets, each identified by an iSCSI IQN. The IQN consists of two parts: a fixed portion based on the product name and serial number, and a target name. Target names are assigned automatically as SAS expanders supporting SMP are discovered. A target node with the 'default' suffix is always created containing a LUN for each discovered SAS/SATA device. See [Drive Map Director](#). Targets can also be created manually using the XstreamVIEW™ System manager.

Each target node can be accessed by one or more network portals. Each network portal is identified by its IP address and listening TCP port. All target names and available target portals are transmitted to a host using the standard iSCSI discovery mechanism.

SAS/SATA device mapping

SAS/SATA devices connected to the XstreamCORE are viewed as Ethernet LUNs to the host computer.

The ATTO XstreamVIEW™ interface displays the current mapping information for SAS/SATA devices.



Note **SCSI commands sent to offline devices are rejected.**

Drive Map Director™

Drive Map Director uses SMP to provide a predictable mapping structure for devices attached to the XstreamCORE ET 8200. To use this feature, drive enclosures must support SAS expanders using the SMP protocol such as HP StorageWorks SAS JBODs.

Mapping Devices with SMP

Drive Map Director assigns an Ethernet target number to each shelf of storage and an Ethernet LUN is reserved for each slot within the enclosure. This numbering scheme is static and will remain with the shelf and slot location whenever a drive or shelf is added or removed. This allows maps to remain the same when shelves or drives need to be swapped out due to failure and remain consistent during power cycles of the XstreamCORE.

1. If you are not already in the XstreamVIEW™ interface, type the IP address of your XstreamCORE in a standard browser as found in [Using XstreamVIEW™ System Manager](#), click **Enter Here**, type in your user name and password, and click **OK**.
2. The **Status** page appears.
3. From the XstreamVIEW™ main menu, click on the **Manual Target Management** menu on the left side of the screen. A list of available targets appears in the **Configure iSCSI Targets** box.
4. Click on the **Device Maps** link next to the target to be configured. The default target is fixed; it cannot be configured or deleted.
5. The **Mapping** page appears. If your storage supports SMP, the XstreamVIEW™ System Manager will display mapping information for your devices.

Exhibit 7 Configure iSCSI Targets

The screenshot shows the ATTO XstreamCORE ET 8200 web interface. At the top, there are icons for PS A, PS B, Management, Ethernet, and iSCSI Target. Below this is a navigation menu on the left with options: HOME | BACK, STATUS, ETHERNET, REMOTE MANAGEMENT, ISCSI, MANUAL TARGET MGT, CONTROLLER, CERTIFICATE MANAGEMENT, FIRMWARE UPDATE, ADVANCED, RESTART, and HELP. The main content area is titled 'ISCSI TARGET MANAGEMENT' and contains the text: 'For the default target and manually-created targets, Access Control and CHAP are disabled.' Below this is a section 'Configure iSCSI Targets' with links for 'default', 'Access Control', 'Device Maps', 'ISCSI CHAP', and 'Discovery'. At the bottom, there is a text input field 'Add an iSCSI target:' and a 'SUBMIT' button.

The screenshot shows the ATTO XstreamCORE ET 8200 web interface. At the top, there are icons for PS A, PS B, Management, Ethernet, and iSCSI Target. Below this is a navigation menu on the left with options: HOME | BACK, STATUS, ETHERNET, REMOTE MANAGEMENT, ISCSI, MANUAL TARGET MGT, CONTROLLER, CERTIFICATE MANAGEMENT, FIRMWARE UPDATE, ADVANCED, RESTART, and HELP. The main content area is titled 'iSCSI MAPPING' and shows a grid of LUNs. The grid is organized into columns labeled LUN 0 through LUN 9. The first row shows LUN 0 (Controller), LUN 1 (Default Target), LUN 2 (Default Target), LUN 3 (Default Target), LUN 4 (Default Target), and LUN 5 (Default Target). The remaining rows show LUNs 6 through 47 in a grid format. A 'FOR: default' dropdown is visible at the top of the grid.

LUN 0	LUN 1	LUN 2	LUN 3	LUN 4	LUN 5
Controller	Default Target				
LUN 6	LUN 7	LUN 8	LUN 9	LUN 10	LUN 11
LUN 12	LUN 13	LUN 14	LUN 15	LUN 16	LUN 17
LUN 18	LUN 19	LUN 20	LUN 21	LUN 22	LUN 23
LUN 24	LUN 25	LUN 26	LUN 27	LUN 28	LUN 29
LUN 30	LUN 31	LUN 32	LUN 33	LUN 34	LUN 35
LUN 36	LUN 37	LUN 38	LUN 39	LUN 40	LUN 41
LUN 42	LUN 43	LUN 44	LUN 45	LUN 46	LUN 47

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CLI view of mapped drives

This is an alternative view (via the CLI) for examining how drives are mapped through the XstreamCORE.

Note gap in LUNs, reserved for drives not currently installed in enclosure

In this example, a single enclosure was discovered with 24 drive slots. A target with an IQN suffix of 50014380052bb03e was created for this enclosure plus a default target created containing an entry for each drive. When additional enclosures are attached a new target will be created for the enclosure containing one entry for each drive in that enclosure. Each new drive will also be added to the default target.

routedisplay

30

;Target Name LUN Device Address LUN VendorID ProductIDSerialNum

;=====

50014380052bb03e0 Controller

50014380052bb03e 1 5000c5001cb9d6b90 HP EG0300FAWHV 3SE19E9X00009023NNJZ

50014380052bb03e 2 5000c5001cb969150 HP EG0300FAWHV 3SE1AAG900009023UPVC

50014380052bb03e 3 5000c5001cb3fd450 HP EG0300FAWHV 3SE1B6AL00009022K5E8

50014380052bb03e 4 5000c5001cb3b7890 HP EG0300FAWHV 3SE1B7HC00009022L2YV

50014380052bb03e 5 5000c5001cb38ed50 HP EG0300FAWHV 3SE1B8BK00009022KBRX

50014380052bb03e 16 5000c5001cbaf1990 HP EG0300FAWHV 3SE1ABD500009023TBAX

50014380052bb03e 17 5000c5001cab46c90 HP EG0300FAWHV 3SE19GEB00009022KVBW

50014380052bb03e 18 5000c5001cba0a810 HP EG0300FAWHV 3SE16SGD00009023V6JN

50014380052bb03e 19 5000c5001cb961e50 HP EG0300FAWHV 3SE1AX4G00009023M8VU

50014380052bb03e 20 5000c5001cbb29510 HP EG0300FAWHV 3SE1BGWX00009023RX5P

50014380052bb03e 21 5000c5001cbae9b10 HP EG0300FAWHV 3SE1B7GL00009023TMEE

50014380052bb03e 22 5000c5001cb93fa50 HP EG0300FAWHV 3SE1AYA600009023RRL1

50014380052bb03e 23 5000c5001cb91a950 HP EG0300FAWHV 3SE1AZBP00009023RS03

50014380052bb03e 24 50014380052bb03e0 HP D7200 SAS AJ941A CN8931000N

default 0 Controller

default 1 5000c5001cb9d6b90 HP EG0300FAWHV 3SE19E9X00009023NNJZ

default 2 5000c5001cb969150 HP EG0300FAWHV 3SE1AAG900009023UPVC

default 3 5000c5001cb3fd450 HP EG0300FAWHV 3SE1B6AL00009022K5E8

default 4 5000c5001cb3b7890 HP EG0300FAWHV 3SE1B7HC00009022L2YV

default 5 5000c5001cb38ed50 HP EG0300FAWHV 3SE1B8BK00009022KBRX

default 6 5000c5001cbaf1990 HP EG0300FAWHV 3SE1ABD500009023TBAX

default 7 5000c5001cab46c90 HP EG0300FAWHV 3SE19GEB00009022KVBW
default 8 5000c5001cba0a810 HP EG0300FAWHV 3SE16SGD00009023V6JN
default 9 5000c5001cb961e50 HP EG0300FAWHV 3SE1AX4G00009023M8VU
default 10 5000c5001cbb29510 HP EG0300FAWHV 3SE1BGWX00009023RX5P
default 11 5000c5001cbae9b10 HP EG0300FAWHV 3SE1B7GL00009023TMEE
default 12 5000c5001cb93fa50 HP EG0300FAWHV 3SE1AYA600009023RRL1
default 13 5000c5001cb91a950 HP EG0300FAWHV 3SE1AZBP00009023RS03
default 14 50014380052bb03e0 HP D7200 SAS AJ941A CN8931000N

5 XstreamCORE Discovery/Target Authentication Configuration

If you are not already in the XstreamVIEW™ interface, type the IP address of your XstreamCORE in a standard browser as found in using XstreamVIEW System Manager, click Enter Here, type in your user name and password, and click OK. The Status page should now appear.

XstreamCORE iSCSI Best Practices

 Note *It is recommended that the XstreamCORE ET 8200 is used on an isolated physical, lossless network when using iSCSI*

- When using the XstreamCORE ET 8200 each data port must be assigned to an independent subnet in order to achieve full bandwidth. The XstreamCORE's Ethernet management ports must also be assigned to independent subnets. All Ethernet port subnets must not overlap.
- Spanning-tree protocol (STP) should be disabled on the switch ports being used for iSCSI traffic. This would mean ports connected to the 8200 and each iSCSI initiator

 Note *If you do need STP enabled it is recommended that you enable the STP FastPort feature on your switch*

- Priority Flow Control (PFC) should be enabled on the switch ports and iSCSI initiators. If PFC is not used, enable flow control (XON/XOFF) instead.

 Note *Priority Flow Control (PFC) and global flow control are incompatible and should not be used in the same environment. It is recommended that PFC is employed for iSER traffic to create a lossless network if possible.*

- Recommend disabling UNICAST storm control on your switch
- It is recommended that you USE broadcast and multicast storm control on your switch
- Set uniform DSCP tagging and PFC configurations for all devices in the network to ensure lossless data traffic flows
- Jumbo frames (large MTU's) should be enabled on all switch ports, the iSCSI initiators, and the 8200 data ports for optimal performance
- If Virtual LAN (VLAN) is required, ATTO recommends configuring VLAN on your switch. A switch created VLAN is a broadcast domain, which helps separate traffic on switch ports
- It is recommended that DCBX is configured to AUTO

 Note *Recommended for larger networks, when there is a lot of broadcast traffic, or when using similar protocols like iSCSI*

Discovery Target Visibility

To prevent initiators from discovering a particular XstreamCORE target, Access Control must be enabled for that target (see [Target Access Control](#) below). Once enabled, only initiators in the list of Allowed Initiators will be able to discover that target. If Access Control is disabled for a target, any initiator with access to the same network the XstreamCORE is located on and which has the correct discovery CHAP credentials (if any) will be able to discover and connect to that target.

The following steps only apply when using one-way or two-way CHAP for discovery:

4. (Two-way CHAP only) Fill in the **iSCSI CHAP Out Account Name** and **CHAP Out Secret**.
5. Fill in the **iSCSI CHAP In Account Name** and **CHAP In Secret**.

Discovery CHAP

1. Click on **Manual Target Mgt** on the left hand side of the screen.
2. Under **Configure iSCSI Targets**, click on the **iSCSI CHAP** link next to **Discovery**.
3. In the **iSCSI CHAP Configuration** page, select the type of CHAP you wish to use for discovery sessions from the drop-down list next to **iSCSI CHAP**, and click Submit.

6. Click **Submit**.

Target Access Control



1. Click on **Manual Target Mgt** on the left hand side of the screen.
2. Under **Configure iSCSI Targets** there is a list of all XstreamCORE targets. Click on the **Access Control** link next to the target you wish to configure.
3. Click on the enabled or disabled button next to Access Control to turn Access Control on or off for this target, and click **Submit**.

 **Note** *If Access Control is disabled, any initiator that can discover this target will be able to connect to it.*

The following steps only apply when Access Control is enabled for this target:

1. The Allowed Initiators list displays the IQN's of initiators that are permitted to connect to this target. To add an initiator select its IQN from the List of Initiators on the left, then click the **Add >>** button.

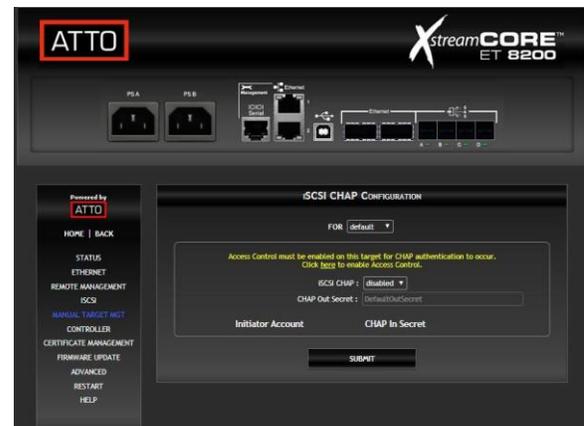
 **Note** *If an initiator's IQN is not listed, you can add it by typing it in under **Create New Initiator Name at the bottom of the page**, and clicking **Create**.*

2. To remove an initiator from the Allowed Initiators list select its IQN from the list on the right, and click on the **<< Remove** button.
3. When finished adding/removing initiators to/from the Allowed list, click **Submit**.

Target CHAP



This section only applies if Access Control is enabled for the target.



1. Click on **Manual Target Mgt** on the left hand side of the screen.
2. Under **Configure iSCSI Targets** there is a list of all XstreamCORE targets. Click on the **iSCSI CHAP** link next to the target you wish to configure.
3. In the **iSCSI CHAP Configuration** page, select the type of CHAP you wish to use when connecting to this target from the drop-down list next to **iSCSI CHAP**, and click **Submit**.

The following steps only apply when using one-way or two-way CHAP to connect to this target:

4. (Two-way CHAP only) Fill in the **CHAP Out Secret**.
5. Under Initiator Account is a list of initiator IQN's which are permitted to connect when Access Control is enabled for this target. If the IQN you wish to change the secret for is not listed, you will need to add it to the target through its **Access Control** page (see Target Access Control).
6. Fill in the **CHAP In Secret** next to the initiator IQN you wish to set.

 **Note** *The CHAP Out Account Name for targets will always be the full IQN (including the XstreamCORE product name and serial number) of that target - it is not configurable.*

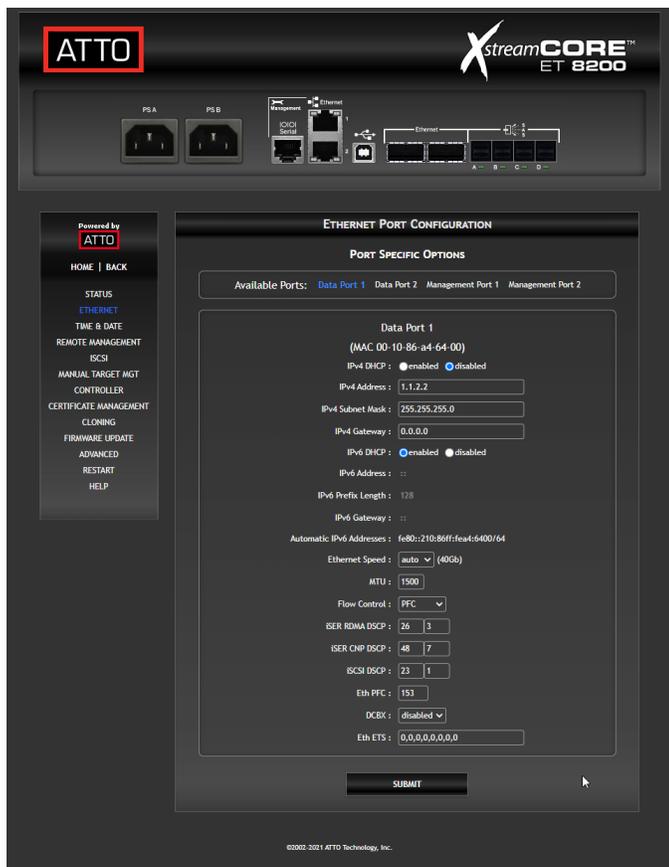
7. Click **Submit**.

 **Note** *These settings can also be modified using the command line interface. For more information, refer to the AccessControl, AccessEntry, iSCSICHAP and iSCSICHAPSecret commands in [Appendix B](#)*

6. Click **Submit**.

 **Note** *It is imperative that if PFC and DSCP are enabled on the XstreamCORE that all devices in the flow are configured with the same settings, consult your switch and NIC manufacturer's documentation on how to set up lossless or no-drop queues.*

Priority Flow Control



1. Click on **Ethernet** on the left side of the screen.
2. Select the data port to be configured from the **Available Ports** list.
3. Configure the DSCP class and corresponding priority flow number for each applicable traffic class.
4. Select the **PFC** option in the **Flow Control** drop down menu.
5. Enter the lossless flow bitmap in the **Eth PFC** entry box.

 **Note** *The PFC bit map is calculated by creating a binary in which a 1 for each bit that corresponds to a lossless flow number. To toggle individual flows without using a bit mask, the EthPFC CLI command can be used instead.*

DCB Exchange (DCBX)

The screenshot shows the ATTO XStream CORE ET 8200 web interface. At the top, there's a header with the ATTO logo and the product name. Below the header, there's a network diagram showing connections for PS A, PS B, iSCSI Storage, Ethernet, and Management ports. The main content area is titled "ETHERNET PORT CONFIGURATION" and "PORT SPECIFIC OPTIONS". It shows "Available Ports: Data Port 1, Data Port 2, Management Port 1, Management Port 2". The configuration is for "Data Port 1" (MAC: 00-10-86-a4-64-00). Settings include: IPv4 DHCP (enabled), IPv4 Address (1.1.2.2), IPv4 Subnet Mask (255.255.255.0), IPv4 Gateway (0.0.0.0), IPv6 DHCP (enabled), IPv6 Address (empty), IPv6 Prefix Length (128), IPv6 Gateway (empty), Automatic IPv6 Addresses (fe80::210:86ff:fe4d:6400/64), Ethernet Speed (auto (40Gb)), MTU (1500), Flow Control (PFC), SER RDMA DSCP (26, 3), SER CNP DSCP (48, 7), iSCSI DSCP (23, 1), Eth PFC (153), DCBX (auto), and Eth ETS (0,0,0,0,0,0). A "SUBMIT" button is at the bottom. A footer shows "©2000-2021 ATTO Technology, Inc."

1. Click on **Ethernet** on the left side of the screen.
2. Select the data port to be configured from the **Available Ports** list.
3. Configure the DCBX setting in the DCBX drop down menu.



Note *With DCBX, network peers can exchange configuration information in order to manage traffic more effectively. A setting of 'enabled' instructs the 8200 to transmit configuration information without automatically changing local configuration to match the network. A setting of 'auto' instructs the 8200 to auto-configure its ETS settings to match that of the network peer.*

4. Click **Submit**.
5. Restart the XStream Core 8200 for DCBX changes to take effect.



Note *Regardless of DCBX setting, the PFC and DSCP values must be locally configured for each ethernet port. A setting of 'auto' will not affect configured PFC or DSCP values.*

Enhanced Transmission Selection (ETS)

The screenshot shows the ATTO Xstream CORE ET 8200 web interface. At the top, there's a navigation bar with the ATTO logo and the product name. Below it, a network diagram shows various ports: PS A, PS B, iSCSI, Ethernet, and Ethernet. The main content area is titled "ETHERNET PORT CONFIGURATION" and "PORT SPECIFIC OPTIONS". It shows "Available Ports: Data Port 1, Data Port 2, Management Port 1, Management Port 2". The configuration is for "Data Port 1" (MAC 00-10-86-a4-64-00). It includes fields for IPv4 DHCP (enabled/disabled), IPv4 Address (1.1.2.2), IPv4 Subnet Mask (255.255.255.0), IPv4 Gateway (0.0.0.0), IPv6 DHCP (enabled/disabled), IPv6 Address, IPv6 Prefix Length (128), IPv6 Gateway, Automatic IPv6 Addresses (fe80::210:86ff::fe4d:6400/64), Ethernet Speed (auto (40Gb)), MTU (1500), Flow Control (PFC), QoS settings (ISER RDMA DSCP: 26, 3; ISER CMP DSCP: 48, 7; ISCSI DSCP: 23, 1), Eth PFC (138), DCBX (enabled), and Eth ETS (0,40,0,40,0,0,20). A "SUBMIT" button is at the bottom.

1. Click on **Ethernet** on the left side of the screen.
2. Select the data port to be configured from the **Available Ports** list.
3. Configure the transmit bandwidth percentage for each priority flow in the **Eth ETS** entry box.



Note *ETS settings affect the percentage of transmit bandwidth allocated to each lossless flow. The leftmost ETS value corresponds to flow 0, the next to flow 1, continuing through flow 7. If the ETS value is 0, strict priority ordering is used for that lossless flow.*

4. Click **Submit**.



Note *If any flow is configured for ETS (nonzero), the bandwidths assigned must add to 100 percent.*

6 Initiator Configuration

It is recommended that the user establish multiple sessions to the XstreamCORE ET 8200 from each host. Also, the user should set up one session per "Data Port" to each of the ports of the network cards. This ensures that if a link goes down a session can be restarted.

Linux

Prerequisites

1. Server with a 40GbE adapter running a supported Linux kernel.
2. XstreamCORE data ports configured and connected to the same network as the 40GbE adapter.

Initiator Setup Instructions

 **Note** *If any command fails with permission denied, prefix the command with `sudo`, and try again.*

Install the iSCSI Initiator Utilities

For systems using apt package management, enter the following command:

```
apt install open-iscsi
```

For systems using yum package management, enter the following command:

```
yum install iscsi-initiator-utils
```

 **Note** *To determine which package management software is used by your Linux distribution, use the following command: which yum*
If the output is similar to `/bin/yum`, this distribution uses yum, otherwise it uses apt.

Configure the Data Ports

1. For iSCSI applications, the in-box driver should be used to connect the 8200 to the host.
2. For iSER (iSCSI extensions for RDMA) applications, load the appropriate driver that supports RDMA on your host installed NIC.
3. Ports may be auto-configured if connected to a network with DHCP. Otherwise, they will need to be assigned an IP address using the ipconfig command.

 **Note** *If Ethernet ports are direct-connected to the XstreamCORE without the use of a switch and both data ports are used, the XstreamCORE data ports must not be on the same subnet. The default subnet mask for the XstreamCORE is 255.255.0.0*

4. Test the network connection using the ping command. Note the IP address of the XstreamCORE data port and then on the initiator, enter the following command:

```
ping ipaddress
```

 **Note** *ipaddress is the address of the XstreamCORE data port.*

Sample output:

```
PING 172.16.1.20 (172.16.1.20) 56(84) bytes of data.
```

```
64 bytes from 172.16.1.20: icmp_seq=1 ttl=64 time=0.144 ms
```

```
64 bytes from 172.16.1.20: icmp_seq=2 ttl=64 time=0.111 ms
```

```
64 bytes from 172.16.1.20: icmp_seq=3 ttl=64 time=0.116 ms
```

LTFS Setup for Tape Devices

If using tape devices in a LTFS setup, install Linear Tape File System (LTFS) software provided by the tape device manufacturer.

If using iSER with tape devices, set max sectors to 2048 before attempting to mount or create a LTFS partition. To do this enter following two commands:

```
rmmod ib_iser
```

```
modprobe ib_iser max_sectors=2048
```

 **Note** *The `ib_iser` change is not persistent across reboots. To make the changes persistent, you should add a kernel module configuration file. This modification will take place whenever the `ib_iser` module is started.*

Create the file `/etc/modprobe.d/ib_iser.conf`
Add the max sectors modification option the the file options `ib_iser max_sectors=2048`

Discover XstreamCORE Targets

If one-way or two-way CHAP authentication has been configured on the XstreamCORE for the discovery session, open `/etc/iscsi/iscsid.conf` in a text editor and add or modify the following lines:

```
discovery.sendtargets.auth.authmethod = CHAP
discovery.sendtargets.auth.username = username
discovery.sendtargets.auth.password = password
```

 **Note** *username and password must match the CHAP In Account Name and CHAP In Secret configured on the*

XstreamCORE for discovery. Both username and password are case-sensitive.

If two-way CHAP authentication has been configured on the XstreamCORE for discovery, also add or modify the following lines in /etc/iscsi/iscsid.conf:

```
discovery.sendtargets.auth.username_in = username_in
discovery.sendtargets.auth.password_in = password_in
```

 **Note** *username_in and password_in must match the CHAP Out Account Name and CHAP Out Secret configured on the XstreamCORE for discovery. Both username_in and password_in are case-sensitive.*

 **Note** *You must log out of any current sessions and re-perform discovery for the CHAP settings to take effect.*

Discover XstreamCORE targets by entering the following command:

```
iscsiadm -m discovery -t st -p ipaddress
```

 **Note** *ipaddress is the address of the XstreamCORE data port to perform discovery through.*

The command should return a list of all XstreamCORE targets available to this initiator.

 **Note** *If an XstreamCORE target exists but is not returned through discovery, check that this initiator is in the list of Allowed Initiators for that target (see Target Access Control in Section 5).*

If "Login failed to authenticate with target" is returned, check that the credentials set in /etc/iscsi/iscsid.conf match the credentials configured on the XstreamCORE.

Configure Target CHAP

This section only applies when one-way or two-way CHAP authentication has been configured on the XstreamCORE to connect to a target. If not using CHAP, skip to [Connect to the Target](#).

1. Enter the following commands:

```
iscsiadm -m node -T target -o update -n
node.session.auth.authmethod -v CHAP
```

```
iscsiadm -m node -T target -o update -n
node.session.auth.username -v username
```

```
iscsiadm -m node -T target -o update -n
node.session.auth.password -v password
```

 **Note** *target must match the full target IQN returned by the discovery command above. username must match the CHAP*

In Account Name configured on the XstreamCORE for this target. password must match the CHAP In Secret configured on the XstreamCORE for this target. Both username and password are case-sensitive.

2. (Two-way CHAP only) Enter the following commands:

```
iscsiadm -m node -T target -o update -n
node.session.auth.username_in -v username_in
```

```
iscsiadm -m node -T target -o update -n
node.session.auth.password_in -v password_in
```

 **Note** *target must match the full target IQN returned by the discovery command above. username_in must match the full target IQN returned by the discovery command above. password_in must match the CHAP Out Secret configured on the XstreamCORE for this target. Both username_in and password_in are case-sensitive.*

 **Note** *You must log out of any current sessions and re-perform discovery for the CHAP settings to take effect.*

Connect to the Target

1. (ISER only) Change the connection mode to ISER by entering the following command:

```
iscsiadm -m node -T target -o update -n iface.transport_name -v iser
```

 **Note** *target must match the full target name returned from the discovery command above.*

2. Log in to the target by entering the following command:

```
iscsiadm -m node -T target -p ipaddress -l
```

 **Note** *target must match the full target name returned from the discovery command above. ipaddress is the address of the XstreamCORE data port used in the discovery command above.*

You can verify the initiator is connected using the command line interface's DisplayInitiators command (see [Appendix B](#)). If using XstreamVIEW™, click on **Advanced** on the left hand side of the screen, enter **DisplayInitiators** under **Enter a CLI command**, and click **Submit**.

Sample Output:

```
Initiator : Target : Transport
```

```
;=====
```

```
iqn.1994-05.com.redhat:767dbe5a936e : default : ISER
```

```
iqn.1994-05.com.redhat:767dbe5a936e : default : ISER
```

If using an iSER connection, verify that the initiator IQN is listed with "iSER" in the transport column.

Drives mapped to that target should now appear in the /dev/ directory as new SCSI devices, for example /dev/sdc.

To refresh available drives enter the following command:

```
iscsiadm -m session -rescan
```

If "iSCSI login failed due to authorization failure" is reported, ensure the CHAP credentials (if any) entered above match those configured on the XstreamCORE for this target.

LTFS Partition (Tape devices only)

 **Note** *Some manufacturers' drivers use non-standard names for tape devices.*

1. To create an LTFS partition, enter the following command:

```
mklfts /dev/IBMtapeX
```

 **Note** *stX is the tape device to create a partition on.*

Windows

Prerequisites

1. Server with 40GbE adapter using the latest drivers.
2. XstreamCORE data ports configured and connected to the same network as the 40GbE adapter.

Setup Instructions

Configure Data Ports

1. Ports may be auto-configured if connected to a network with DHCP. Otherwise, they will need to be assigned an IP address, which can be done using the netsh command in a command prompt or PowerShell.

 **Note** *If Ethernet ports are direct-connected to the XstreamCORE without the use of a switch and both data ports are used, the XstreamCORE data ports must not be on the same subnet. The default subnet mask for the XstreamCORE is 255.255.0.0*

2. Test the network connection using the 'ping' command. Note the IP address of the XstreamCORE data port and then on the initiator, enter the following command:

```
ping ipaddress
```

 **Note** *ipaddress is the address of the XstreamCORE data port.*

Sample output:

2. To mount an LTFS partition, enter the following command:

```
lfts /path/to/mount -o devname=/dev/IBMtapeX
```

 **Note** */path/to/mount is the desired directory in which to mount the partition. stX is the tape device where the LTFS partition resides.*

Disconnect from the Target

1. To log out from a target, enter the following command:

```
iscsiadm -m node -T target -p ipaddress -u
```

 **Note** *target must match the full target name returned from the discovery command above. ipaddress is the address of the XstreamCORE data port used in the discovery command above.*

 **Note** *You can connect/disconnect to/from all discovered targets by omitting the -T target parameter from the log in/out commands*

Pinging 172.16.1.20 with 32 bytes of data:

```
Reply from 172.16.1.20: bytes=32 time<1ms TTL=64
```

Ping statistics for 172.16.1.20:

```
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
```

Approximate round trip times in milli-seconds:

```
Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

LTFS Setup for Tape Devices

If using tape devices, install Linear Tape File System (LTFS) software provided by your tape device's manufacturer.

For iSCSI to work with LTFS, the iSCSI maximum transfer length must be set to at least 1MiB and the maximum burst length set to 4MiB. This will require modifying the registry. In 'HKEY_LOCAL_MACHINE/SYSTEM/CurrentControlSet/Control/Class/{4D36E97B-E325-11CE-BFC1-08002BE10318}/<instance_number>/Parameters', set MaxTransferLength to 1048576 (decimal) or 100000

(hexadecimal), and MaxBurstLength to 4194304 (decimal) or 400000 (hexadecimal), and restart the server.

Discover XstreamCORE Targets

Using iSCSI Software Initiator GUI

To open the iSCSI Software Initiator GUI, click on the **start** button to open the start menu/screen, type in **iSCSI Initiator** and press **enter**. If prompted to start the iSCSI service, click **Yes**, and type in **iSCSI Initiator** in the start menu again. You should now see a window titled iSCSI Initiator Properties.

Create Discovery Portal

1. (Two-way discovery CHAP only) Click on the **Configuration** tab along the top of the iSCSI Initiator Properties window. Click on the **CHAP...** button on the right hand side. Enter the Initiator CHAP secret.

 **Note** *The Initiator CHAP secret must match the CHAP Out Secret configured for discovery on the XstreamCORE. The secret is case-sensitive.*

2. Click on the **Discovery** tab near the top of the iSCSI Initiator Properties window.
3. Click on the **Discovery Portal...** button.
4. In the **Discover Target Portal** window, under **IP address**, enter the IP address of the XstreamCORE data port to connect through.
5. (Discovery CHAP disabled only) Click **OK** in the **Discovery Target Portal** window.

Discovery CHAP

This section only applies when using one-way or two-way CHAP for discovery sessions.

1. Click on the **Advanced...** button in the lower left corner of the **Discover Target Portal** window.
2. Check the box next to **Enable CHAP log on**.
3. Inside **CHAP Log on** information fill in the Name and Target Secret used for discovery.

 **Note** *The Name and Target Secret must match the CHAP In Account Name and CHAP In Secret configured on the XstreamCORE for discovery. Both Name and Target Secret are case-sensitive.*

4. (Two-way discovery CHAP only) Check the box next to **Perform mutual authentication**.
5. Click **OK** in the **Advanced Settings** window.
6. Click **OK** in the **Discovery Target Portal** window.

The IP address should now be displayed in the list under **Target portals**. If "Connection failure" is reported, make sure that the firewall is configured to pass iSCSI traffic. If using CHAP, ensure the name and secrets are configured correctly

on both the iSCSI Software Initiator GUI and XstreamCORE for discovery.

Using iSCSI PowerShell Module

If not already done, configure the iSCSI service to start automatically. To do this open PowerShell and enter the following two commands:

```
Set-Service -Name msiscsi -StartupType Automatic
```

```
Start-Service msiscsi
```

 **Note** *If an "Access is denied." error is returned, run the PowerShell as an Administrator, and try again.*

Create an iSCSI Target Portal

 **Note** *If "Authentication Failure" is returned check to make sure the credentials and authentication type matches between the XstreamCORE and the initiator.*

No CHAP

1. Enter the following command:

```
New-IscsiTargetPortal -TargetPortalAddress "ipaddress" -AuthenticationType None
```

 **Note** *ipaddress is the address of the data port on the XstreamCORE through which to perform discovery.*

One-way CHAP

1. Enter the following command:

```
New-IscsiTargetPortal -TargetPortalAddress "ipaddress" -AuthenticationType ONEWAYCHAP -ChapUsername Username -ChapSecret Secret
```

 **Note** *ipaddress is the address of the data port on the XstreamCORE through which to perform discovery. Username must match the CHAP In Account Name configured on the XstreamCORE for discovery. Secret must match the CHAP In Secret configured on the XstreamCORE for discovery. Both username and secret are case-sensitive.*

Two-way CHAP

1. (If not already set) Enter the following command:

```
Set-IscsiChapSecret -ChapSecret Secret
```

 **Note** *Secret must match the CHAP Out secret configured on the XstreamCORE for discovery. The secret is case-sensitive.*

2. Enter the following command:

```
New-IscsiTargetPortal -TargetPortalAddress "ipaddress" -AuthenticationType MUTUALCHAP -ChapUsername Username -ChapSecret Secret
```



Note *ipaddress is the address of the data port on the XstreamCORE through which to perform discovery. Username must match the CHAP In Account Name configured on the XstreamCORE for discovery. Secret must match the CHAP In Secret configured on the XstreamCORE for discovery. Both the username and secret are case-sensitive.*

Once the Target Portal is created, refresh the list of available targets by entering the following command:

Update-IscsiTarget

List all available targets by entering the following command:

Get-IscsiTarget

Connect to the Target

Using iSCSI Software Initiator GUI

1. (Two-way CHAP only) If not already done, click on the **Configuration** tab along the top of the **iSCSI Initiator Properties** window. Click on the **CHAP...** button on the right hand side, fill in the Initiator CHAP secret, and click **OK**.



Note *The Initiator CHAP secret must match the CHAP Out secret configured on XstreamCORE for the target. The secret is case-sensitive.*

2. In the **iSCSI Initiator Properties** window, click on the **Targets** tab.
3. Under **Discovered targets**, click on the **Refresh** button.
4. Select the name of the target, and click on the **Connect** button.
5. (CHAP disabled only) Click **OK** in the **Connect To Target** window.

CHAP

This section only applies when using one-way or two-way CHAP to connect to this target.

1. Click on the **Advanced...** button in the **Connect To Target** window.
2. Check the box next to **Enable CHAP log on**.
3. In the CHAP Log on information fill in the **Name** and **Target Secret** used for this target.



Note *The Name and Target Secret must match the CHAP In Account Name and CHAP In Secret configured on the XstreamCORE for this target. The Name and Target Secret are both case-sensitive.*

4. (Two-way CHAP only) Check the box next to Perform mutual authentication.
5. Click **OK** in the **Advanced Settings** window.
6. Click **OK** in the **Connect To Target** window.

In the **Discovered targets** list the Status of the target should now show as Connected. If an "Authentication Failure" error message appears check that the name and secret(s) are configured correctly on both the iSCSI Software Initiator GUI and XstreamCORE for this particular target.

Using iSCSI PowerShell Module

No CHAP

Enter the following command:

```
Connect-IscsiTarget -NodeAddress node -AuthenticationType None
```



Note *node is the full target name of the target you wish to connect to. It is listed under the NodeAddress column returned by the Get-IscsiTarget command.*

One-Way CHAP

1. Enter the following command:

```
Connect-IscsiTarget -NodeAddress node -AuthenticationType ONEWAYCHAP -ChapUsername Username -ChapSecret Secret
```



Note *node is the full target name of the target you wish to connect to. It is listed under the NodeAddress column returned by the Get-IscsiTarget command. Username must match the CHAP In Account Name configured on the XstreamCORE for this target. Secret must match the CHAP In Secret configured on the XstreamCORE for this target. Both the username and secret are case-sensitive.*

Two-Way CHAP

1. (If not already set) Enter the following command:

```
Set-IscsiChapSecret -ChapSecret Secret
```



Note *Secret must match the CHAP Out secret configured on the XstreamCORE for this target. The secret is case-sensitive.*

2. Enter the following command:

```
Connect-IscsiTarget -NodeAddress node -AuthenticationType MUTUALCHAP -ChapUsername Username -ChapSecret Secret
```



Note *node is the full target name of the target you wish to connect to. It is listed under the NodeAddress column returned by the Get-IscsiTarget command. Username must match the CHAP In Account Name configured on the XstreamCORE for this target. Secret must match the CHAP In Secret configured on the XstreamCORE for this target. Both the username and secret are case-sensitive.*

Once connected the attached drives should now appear in Disk Management.

Use Action > Rescan Disks in Disk Management to detect any changes to available drives.

Disconnect from a Target

Using iSCSI Software Initiator GUI

1. Click on the **Targets** tab along the top of the **iSCSI Initiator Properties** window.
2. Under **Discovered targets**, select the name of the target, and click on the **Disconnect** button.

Advisements

Jumbo Frames

Care should be taken to ensure end-to-end path maximum transmission unit (MTU) support. Failure to provide a consistent configuration may result in packet fragmentation. All equipment on the same layer 2 network (the same LAN or VLAN) must support the same frame size. If the MTU is increased on one end device, the switch and receiving end must also be configured for larger MTUs. A mixture of devices configured for jumbo frames and standard frames on the same network can cause performance issues.

Using iSCSI PowerShell Module

1. Enter the following command:

```
Disconnect-IscsiTarget -NodeAddress node
```



Note

node is the full target name of the target you wish to connect to. It is listed under the NodeAddress column returned by the Get-IscsiTarget command. If prompted for confirmation, enter 'A' for Yes to All.



Note

Some vendors include the headers in the size settings while others do not. This may require that equipment from different vendors be configured to different values to make the settings match.

Network Configuration

When configuring the IP address for Data Ports (DP1 & DP2), they should be configured on two different Ethernet LAN segments. The default port for iSCSI is 3260. DHCP should lease two separate subnets. For example:

DP1 at 192.168.1.0/24 and DP2 at 192.168.2.0/24.

7 Remote Monitoring, Management

The Ethernet management port provides monitoring and management using the XstreamVIEW™ System Manager

Remote system monitoring may be set up through the Remote Management page of the XstreamVIEW™ interface (see [XstreamVIEW System Manager](#)) using the Simple Network Management Protocol (SNMP) or Email features.

Various types of problems may create a notification:

- Device errors such as medium errors, aborted commands and hardware errors
- Device transitions from online to offline
- Critical and warning temperature conditions
- Power supply status conditions

Messages may state that a device is not working, a medium has an error, or a command has been stopped.

Exhibit 8 The Remote Management page in the

XstreamVIEW™ System Manager

The screenshot shows the 'REMOTE MANAGEMENT' interface. It is divided into three main sections: 'DNS Configuration', 'SNMP Configuration', and 'Email Configuration'.
1. **DNS Configuration:** Includes a text input for 'IP DNS Server Address' and a status indicator 'Server not configured'.
2. **SNMP Configuration:** Features radio buttons for 'SNMP' (currently 'enabled'), 'SNMP Traps' (currently 'disabled'), and 'SNMP Extended Traps' (currently 'disabled'). It also includes a 'SNMPv3 Engine ID' field with the value '800011C303001086A46402', and fields for 'SNMPv3 Username', 'SNMPv3 Password', and 'Confirm SNMPv3 Password'. Below these is a table for 'SNMP Trap Recipient IP Addresses' with six rows, each containing an IP address field (all set to '0.0.0.0') and a dropdown menu for severity level (all set to 'None').
3. **Email Configuration:** Includes radio buttons for 'Email Notification' (currently 'disabled'), a 'SMTP Server Address (IP or Name)' field (set to '0.0.0.0'), 'Username', 'Password', and 'Sender Address (From)' fields. Below this is a table for 'Recipient Address (To)' with five rows, each containing an IP address field and a dropdown menu for severity level (all set to 'None').
A 'SUBMIT' button is located at the bottom center of the page.

You may designate which warning level a recipient receives. For example, a recipient with a critical severity level only receives critical messages and not warning or informational messages.

In both monitoring systems, you select the warning levels for each recipient:

- **All:** all warnings, critical events and informational messages
- **Warning:** events which are either warnings or critical events
- **Critical:** only events which are critical
- **None:** no messages are sent

Exhibit 9 The Remote Management page in the XstreamVIEW™ System Manager

SNMP-based monitoring

The Simple Network Management Protocol (SNMP) facilitates the exchange of management information between network devices.

An agent residing in the XstreamCORE takes information from the XstreamCORE and translates it into a form compatible with SNMP.



Note

Consult your network administrator for further assistance with SNMP.

SNMP Agent Setup

1. If you are not already in the XstreamVIEW™ interface, type the IP address of your XstreamCORE in a standard browser as found in [Using XstreamVIEW™ System Manager](#), click **Enter Here**, type in your user name and password, and click **OK**.
2. On the left-hand menu, click **Remote Management**.
3. The **Remote Management** page appears.
4. Click on the enabled radio button next to the SNMP heading.
5. Click on the appropriate radio buttons for SNMP Traps and SNMP Extended Traps.
6. SNMP Traps and SNMP Extended Traps are notifications for SNMP functions such as device transitions and device errors.
7. Enter a **SNMPv3 Username**.



Note

This username and password are separate from the Administrator and Read-Only credentials set in the [Modify Password](#) section of the manual. The SNMPv3 credentials are only used for SNMPv3.

8. Enter and confirm a **SNMPv3 Password**.
9. Enter the IP addresses of those who should receive messages (SNMP trap recipients) in the text boxes on the left.
10. Select the type of message you wish each recipient to receive from the drop down box next to each address.
11. Click **Submit**.

SNMP Client Setup

The SNMPv3 client configuration method will depend on your client, but the following information will be needed:

1. The username and password entered above in the **Remote Management** page.
2. The SNMPv3 Engine ID from the **Remote Management** page.
3. The XstreamCORE management IP address.
4. The XstreamCORE uses AES as its SNMPv3 privacy protocol, and SHA as its SNMPv3 authentication protocol.



Note

SNMPv3 trap handlers will require the same information as the client.

Exhibit 10 Events triggering SNMP notification for extended or standard trap generation, severity level and explanation

Event	Severity Level	Extended Traps disabled	Extended Traps enabled	Explanation
Aborted Command	Warning	No	Yes	A command has been aborted.
Device Transition	Info	No	Yes	A target device has failed, become offline or come online.
Ethernet Link Down	Info	Yes	Yes	A loop down event on an Ethernet port has occurred.
Ethernet Link Up	Info	Yes	Yes	A loop up event on an Ethernet port has occurred.
Hardware Error	Critical	No	Yes	An unrecoverable target device failure.
Illegal Request	Info	No	Yes	An illegal SCSI request has been attempted.
Medium Error	Warning	No	Yes	A command terminated with an error condition that may have been caused by a flaw in the target device's physical medium or its recorded data.
Power Supply Down	Critical	Yes	Yes	A power supply has powered down or was down after unit power-up.
Temperature	Info	Yes	Yes	The unit's internal temperature has increased or decreased to within standard operating ranges.
Temperature	Warning	Yes	Yes	Unit's internal temperature has increased to at or within the unit's maximum operating temperature less the unit's temperature warning offset or decreased to at or within the unit's minimum operating temperature plus the unit's temperature warning offset.
Temperature	Critical	Yes	Yes	Unit's internal temperature has increased to at or above the maximum operating temperature or decreased to at or below the minimum operating temperature.
Unit Attention	Info	No	Yes	A unit attention condition has occurred.
Unit Power On	Info	Yes	Yes	The unit has been powered up.

Email messages perform error notification

Email notification allows the XstreamCORE to send an Email message to you, a network administrator or other users when certain events occur. Serious error messages are sent immediately, while messages for less serious errors are sent every 15 minutes.

You may send Emails to up to five Email addresses and designate which conditions prompt each Email notification.

When an event that has been designated as requiring Email notification occurs, the XstreamCORE sends the message; it cannot respond to a rejection by a server for an invalid address. Ensure all Email addresses typed in are valid.

Each Email is time stamped when it leaves as part of the SMTP header information as shown in [Exhibit 10](#).

Exhibit 11 The Email messages sent by the XstreamCORE follow this format.

Subject: [The Type of Event that Occurred]

Message Body:

This is a status message from [XstreamCORE name]. Identifying information as well as the most recent entries from the event log appear below.

***** Unit Information *****

Serial Number : [Serial Number]

IP Addresses: [IP Address1]

[IP Address2]

***** Event Log Entries *****

Redfish and Swordfish monitoring

Redfish is an HTTP-based API used to manage networked devices. Swordfish is a SNIA-designed extension of Redfish that adds management of storage equipment and services. The XstreamCORE controller supports basic Redfish and Swordfish functionality.

The XstreamCORE controller supports both basic authentication and Redfish session authentication. Redfish clients must support HTTPS in order to communicate with the XstreamCORE controller.

1. If you are not already in the XstreamVIEW™ interface, type the IP address of your XstreamCORE in a standard browser as found in [Using XstreamVIEW™ System Manager](#), click **Enter Here**, type in your user name and password, and click **OK**.
2. On the left-hand menu, click **Remote Management**.
3. The **Remote Management** page appears.
4. Click on the enabled radio button next to the Email Notification heading.
5. Type in the SMTP Server IP address.
6. Type in the user name and password of your SMTP Email account if your server requires it.
7. Type in the sender address (Emails show this name in the From field).
8. Type in up to five Email addresses.
9. Choose **All**, **Warning**, or **Critical** for each Email address.
10. When all information is typed in, click **Submit**.



Note **Redfish client setup will vary greatly depending upon which client is used.**

Redfish client setup will require the following information:

1. XstreamCORE management IP address.
2. Administrator Username or Read-Only Username.
3. Password for Administrator or Read-Only account.
4. Redfish and Swordfish Schema. The XstreamCORE controller is monitored using the DMTF DSP8010 schema.

8 Update Firmware

The ATTO XstreamCORE has several processors which control the flow of data. The firmware to control these processors can be upgraded in the field using the PUT command from an SFTP connection. The preferred method is to use ATTO XstreamVIEW™ System Manager.

 **Note** *The recommended method for updating firmware for the XstreamCORE is the Firmware Update page in the ATTO XstreamVIEW™ interface.*

The XstreamCORE firmware is distributed as a .zbd file from the ATTO Technology web site at www.atto.com. Download the file and note the filename.

 **Note** *There is always a backup image in the XstreamCORE, in case the flashing process fails. After updating the firmware, verify the correct program version is executing by viewing the status page and checking the firmware revision number.*

Using XstreamVIEW™

1. If you are not already in the XstreamVIEW™ interface, type the IP address of your XstreamCORE in a standard browser as found in [Using XstreamVIEW™ System Manager](#), click **Enter Here**, type in your user name and password, and click **OK**.

 **Note** *The default user name and password values can be found on the bottom of the unit. The user name is case insensitive and password is case sensitive. It is best practice to change user names and passwords. Refer to [Modify passwords](#). During the first login to XstreamVIEW, the XstreamCORE will prompt you to change the unit's default password. After the new password is accepted, the unit will reboot. Wait up to two minutes for the XstreamCORE Ready LED to light indicating the XstreamCORE has completed its power-on self-test sequence. Re-launch your browser and navigate to the correct IP address. Your browser points to the ATO XstreamVIEW™ welcome screen. Type in the user name and password.*

 **Note** *You can access XstreamVIEW from either data ports or management ports.*

2. Click on the **Firmware Update** menu item on the left-hand side of the page.
3. The **Firmware Update** page appears. Click the **Choose File** button to locate the firmware that you downloaded earlier.
4. Select the file.
5. Click **Upload**.
6. Wait until a success message is displayed.
7. Click on the **Restart** button at the bottom of the page.

Using SFTP

1. Establish an SFTP link to the storage controller that is to be flashed.

 **Note** *The storage controller SFTP server is at port 20, not the default port 22.*

 **Note** *The storage controller only supports one session at a time. If your client uses multiple simultaneous sessions to accelerate data transfer, the SFTP link will not work correctly.*

2. As an example, using OpenSSH, the connection would be made with the following command where username is the username set in [Modify passwords](#), and x.x.x.x is the IP address of the XstreamCORE.
`sftp -P 20 username@x.x.x.x`
3. Enter your password when prompted.
4. Once logged in, upload the zbd file using the “put” command:
`Put c:\firmware\xc8200_3_00_101F.zbd`
5. Once the upload is complete, check the XstreamCORE log to verify successful upload using the **DumpEventLog** command.
6. If the upload and firmware update were logged as successful, cycle power on the XstreamCORE using the **FirmwareRestart** command to apply the new firmware.

9 Interface Options

Alternative methods to the ATTO XstreamVIEW™ Interface may be used to manage the XstreamCORE. ATTO XstreamVIEW™ System Manager is the recommended interface. Access XstreamVIEW using standard browsers Google Chrome, Firefox and Microsoft Edge.

Using XstreamVIEW™ System Manager

Each page in the ATTO XstreamVIEW™ System Manager provides information and/or configuration parameters based on a specific topic.

ATTO XstreamVIEW™ is the recommended management tool for the XstreamCORE. It is a web-based graphical user interface (GUI) that allows you to manage the XstreamCORE by clicking choices and commands in traditional GUI fashion or by entering CLI commands directly.

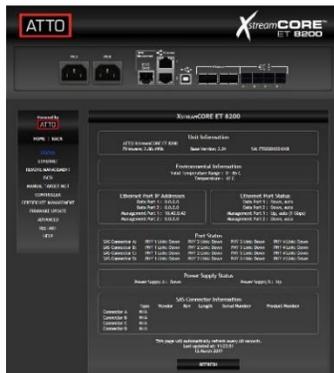
Opening an XstreamVIEW™ session

1. Point your browser at the IP address of the XstreamCORE. Refer to [Discover the IP address](#).
2. The XstreamVIEW™ home page is displayed. Click **Enter**.
3. Enter the user name and password values.

 **Note** *The default user name and password values can be found on the bottom of the unit. The user name is case insensitive and password is case sensitive. It is best practice to change user names and passwords. Refer to [Modify passwords](#). During the first login to XstreamVIEW, the XstreamCORE will prompt you to change the unit's default password. After the new password is accepted, the unit will reboot. Wait up to two minutes for the XstreamCORE Ready LED to light indicating the XstreamCORE has completed its power-on self-test sequence. Re-launch your browser and navigate to the correct IP address. Your browser points to the ATO XstreamVIEW™ welcome screen. Type in the user name and password.*

The Status page appears.

Exhibit 12 Status Page – useful for reporting high-level system ID, environmental, and port connectivity status information



Each page can be reached through the menu at the side of each page. An image on each page's header shows each port in the product faceplate. Each port is clickable and takes you to the appropriate page.

Exhibit 12 Ethernet Port Configuration Page – useful for easy configuration and display of IP settings for all data and management ports



If you have completed configuration operations and have clicked **Submit** on the page you are viewing, go to the **Restart** page and restart the XstreamCORE to save the settings. Some settings may not take effect until the controller is restarted.

If you have not completed configuration changes, go on to the next page.

Using the serial port

1. Connect a cable from XstreamCORE RS-232 serial port to the serial (COM) port on a personal computer.
2. Turn on the XstreamCORE.
3. Start a terminal emulation program on the personal computer, and use it to connect to the XstreamCORE. For example, if you are using HyperTerminal on a computer running a Windows operating system, type **XstreamCORE** in the New Connection dialog box.
4. Click **OK**.
5. In the Connect To dialog box, for the Connect using field, select the COM port number to which your serial cable is connected.
6. Click **OK**.
7. In the COM Properties dialog box select the following values:
 - Bits per second: 115200
 - Data Bits: 8
 - Parity: None
 - Stop Bits: 1
 - Flow Control: None
 - Terminal type: ASCII
 - Echo: on
8. Click **OK**.
9. After you connect to the XstreamCORE, start-up messages are displayed. These messages are only displayed when the controller is starting up (power is connected to the controller but the Ready LED indicator is not yet lit). If the Ready LED indicator is lit before the user connects the serial cable or starts/sets up the terminal program, you will need to press Enter to receive a Ready message prompt.
10. In serial port sessions, there is no prompt on the line below the word Ready. Begin typing commands in the blank line where the cursor is resting. No user name or password is required for serial port access.
11. To verify that you have connected successfully, type **help** after the Ready prompt and press **Enter**.



Note

If a list of all available commands does not appear on the screen, review the steps in this section, check the cable, or contact service personnel until the problem is solved.



Note

If you have difficulty using the serial port, verify that you have the correct settings and that your serial cable is less than two meters in length.

Using SSH

Up to two SSH sessions can be conducted simultaneously. A serial port session can use the CLI while SSH sessions are open. Whichever session issues the first **set** CLI command can continue to issue set commands, while the other sessions can only issue **get** commands or display information. Once a connection is established, refer to [CLI provides ASCII-based Interface](#).

Making an SSH connection

1. Start an SSH client.



Note

There is more than one way to connect to the XstreamCORE using an SSH client. Your SSH client may operate differently than in the following instructions.

2. In your SSH client, connect to the XstreamCORE. As an example, using OpenSSH, the connection would be made with the following command where username is the username set in [Modify passwords](#), and x.x.x.x is the IP address of the XstreamCORE.

```
ssh username@x.x.x.x
```

3. Enter your password.
4. To quit an SSH session, type exit.

Appendix A Cabling

ATTO XstreamCORE SAS connections connect SAS or SATA storage devices into the Ethernet Storage Area Network (SAN). Use an Ethernet connection to use the ATTO XstreamVIEW™ System Manager.

Make sure all cables are anchored securely at both ends with the proper connectors.

SAS/SATA connections

The XstreamCORE supports a wide variety of SAS & SATA storage devices.

 **Note** *The lengths in the table are for passive copper cables*

Each SAS connection is totally independent from the other SAS connections. SAS PHY auto-negotiates the appropriate sync rates with the connected devices. Check the type of cable, cable length limit and number of devices recommended for each port.

Keep cable lengths as short as possible to ensure the highest signal quality and performance. These cable lengths include the wiring inside the devices.

Connectors	Max Cable Length	Max Speed
SFF8644 - SFF8644	6m	12Gb/s
SFF8644 - SFF8088	10m	6Gb/s
SFF8644 - SFF8087	1m	6Gb/s

Ethernet Data Connection

Ethernet technology offers a variety of cabling options. The type of cable required varies depending upon the application, environment and distance.

The 40Gb Ethernet data ports provide host connectivity and are backward compatible with 10Gb Ethernet. The table shows optical connections:

 **Note** *All cable types listed on this page are available on the ATTO web store at www.atto.com/store*

 **Note** *The table shown is for optical cabling with QSFP+ modules*

Cable Type	40Gb/s	10Gb/s	1Gb/s
50 µm OM2	35m	82m	550m
50 µm OM3	100m	300m	>550m
50 µm OM4	150m	400m	
Long wave, Single Mode	10,000m	10,000m	10,000m

 **Note** *Long wave operation requires long wave QSFP+ modules (not supplied).*

 **Note** *1GbE is not supported on the data ports*

Ethernet management connection

The 100/100BASE-T Ethernet ports provide remote monitoring and management using the ATTO XstreamVIEW™ System Manager.

When you connect an Ethernet cable between the XstreamCORE and a 100/100BASE-T connection, you may

need a crossover cable connecting directly to a computer. The ATTO XstreamCORE auto detects the Ethernet speed by default.

 **Note** *It is recommended to use a good quality Cat 5e or better cable.*

Serial port connection

The ATTO XstreamCORE supports remote service operations over the RS-232 serial port using standard terminal emulation software available with most systems.

Connect a RJ45 to DB-9 serial cable (null modem) between the ATTO XstreamCORE serial port and one of the computer's serial COM ports.

A gender changer or DB-9 to DB-25 converter may be needed depending on the cables being used.

Appendix B CLI Provides ASCII-based Interface

The command line interface (CLI) provides access, configuration, and monitoring for ATTO XstreamCORE services through a set of ASCII commands. CLI commands may be entered through a serial port connection, SSH session, or the Advanced page on the XstreamVIEW GUI.

- CLI commands are context sensitive and generally follow a standard format:
[Get|Set] Command [Parameter1|Parameter2] followed by the return or enter key
- CLI commands are case insensitive: you may type all upper or all lower case or a mixture. Upper and lower case in this manual and the help screen are for clarification only.
- Commands generally have three types of operation: get, set and immediate.
- The get form returns the value of a parameter or setting and is an informational command.
- Responses to get commands are followed by Ready.
- The set form is an action that changes the value of a parameter or configuration setting. It may require a SaveConfiguration command and a restart of the system before it is implemented. The restart can be accomplished as part of the SaveConfiguration command or by using a separate FirmwareRestart command. A number of set commands may be issued before the SaveConfiguration command.
- Responses to set commands are either an error message or Ready. *. The asterisk indicates you must use a SaveConfiguration command to finalize the set command. SaveConfiguration asks if you want to restart the system or not.
- Immediate commands are set commands which are executed right away and do not require a Save Configuration command.
- Responses to Immediate commands are either an error message or data results followed by Ready.

Exhibit 13 Symbols, typefaces and abbreviations used to indicate functions and elements of the command line interface used in this manual

Command conventions

Symbol	Indicates
[]	Required entry
<>	Optional entry
	pick one of
...	Ellipses, repetition of preceding item
\n	end of line
-	a range (6 – 9 = 6, 7, 8, 9)
el	Ethernet LUN (0 <= el <= 1024)
dp	Ethernet Data port number (1 <= dp <= 2)
sasConn	SAS connector name (A, B, C, D)
mp	Ethernet Management port number (1 <= mp <= 2)

CLI error messages

The following error messages may be returned by the Command line Interface

ERROR. Invalid Command. Type 'Help' for command list.

ERROR. Wrong/Missing Parameters

Usage: <usage string>

ERROR. Command Not Processed

CLI summary reference

A summary of the Command Line Interface commands, their defaults, and where you can find the specific command. Commands which have no default values associated with them have a blank entry in that column of the table.

Command	Default	Example
AccessControl	disabled	get AccessControl default
AccessEntry		set AccessEntry default iqn.1994-05.com.CENTOS.host
BootEthernetDelay	0	get BootEthernetDelay
BootOldestImage		BootOldestImage
ClearCLILog		ClearCliLog
ClearEventLog		ClearEventLog
ControllerLUN	enabled	get controllerlun
ControllerModel		get controllermodel
ControllerName	“ “	set controllername Omega6
CoreDumpInfo		CoreDumpInfo
DataMoverStats (not supported on the ET 8200T)		get DataMoverStats all
Date	10/25/2016 (with SNTP disabled)	set date 03/03/2019
DeleteAllMaps		deleteallmaps
DisplayInitiators		DisplayInitiators
DPMTU	1514	get DPMTU all
DumpCLILog		DumpCliLog
DumpConfiguration		dumpconfiguration
DumpEventLog		dumpeventlog
EmailFromAddress	“ “	get emailfromaddress
EmailNotify	disabled	get emailnotify

EmailNotifyAddress	“ “	set emailnotifyaddress 5 bw@abc.com
EmailPassword		set emailpassword Password12345
EmailServerAddress	0.0.0.0	get emailserveraddress
EmailUsername	“ “	set emailusername beta321
EthDCBX	disabled	set EthDCBX DP1 auto
EthDpConnectorInfo		get EthDpConnectorInfo all
EthDpStats		get EthDpStats all
EthernetPort	enabled	set EthernetPort mp1 disabled
EthernetSpeed	auto	set ethernetspeed mp1 100
EthETS	0,0,0,0,0,0	set EthETS dp1 0,40,0,40,0,0,20
EthFlowControl	global	set EthFlowControl PFC
EthPFC		set EthPFC 3 enabled
EthPFCBitmap		set EthPFCBitmap 0x8
EthPortList		EthPortList
Exit		exit
FirmwareRestart		firmwarerestart
FlashImages		flashimages
Help		help AccessControl
HttpsCertInfo		HttpsCertInfo
HttpsCertParams	Country (C) = "" State (ST) = "" Locality (L) = "" Organization (O) = "" Organization Unit (OU) = "" Common Name (CN) = ""	get HttpsCertParams
IdentifyController	disabled	set identifycontroller enabled
IdentifyLUN		IdentifyLUN default 3
Info		info
IPAddress	With IPDHCP disabled: DP1 = 10.0.0.1 DP2 = 10.0.0.2 MP1 = 10.0.0.3 MP2 = 10.0.0.4	get ipaddress mp1
IPDHCP	enabled	set ipdhcp mp1 IPv4 enabled
IPDNSServer	127.0.0.1	get ipdnsserver

IPGateway	0.0.0.0	set ipgateway mp1 200.10.22.3
IPSubnetMask	With IPDHCP disabled: 255.255.0.0	get ipsubnetmask mp1
IPV6Prefix		Get ipv6prefix all
iSCSIAlias	“ “	Set iSCSIAlias Backup_Cluster_1
iSCSICHAP	disabled	get iSCSICHAP all
iSCSICHAPSecret		set iSCSICHAPSecret default in iqn.1994-05.com.CENTOS.host Password12345
iSCSICongestionAlgorithm	CUBIC	set iSCSICongestionAlgorithm LBWC
iSCSIDeletedTargets		iSCSIDeletedTargets
iSCSIDSCP	0	set iSCSIDSCP 0x1A
iSCSIFastReTx	Enabled	Set iSCSIFastReTx disabled
iSCSIReceiveAllocation		get iSCSIReceiveAllocation
iSCSIRestoreDeletedTarget		iSCSIRestoreDeletedTarget all
iSCSISACK	Enabled	Set iSCSISACK disabled
iSCSITarget		
iSCSITargetCopy		
iSCSITargetNameDisplay		iSCSITargetNameDisplay
iSCSITargetRename		iSCSItargetrename TargetA targetB
iSERCNPDSCP	0	set iSERCNPDSCP 0x30
iSERDataDSCP	0	set iSERDataDSCP 0x1A
LoginRetentionTimeout	0 (8200); 5 (8200T)	get LoginRetentionTimeout
IsReserved		IsReserved
MaxOpTemp	65	get maxoptemp
MinOpTemp	0	set minoptemp 10
OEMConfigFile	ATTO	get oemconfigfile
OpTempWarn	10	set optempwarn 15
Password		set password Password12345
Performance		get performance
Ping		ping mp1 192.42.155.155
ReadOnlyPassword	P@SSw0rd	set readonlypassword Password12345
ReadOnlyUsername	user	get readonlyusername

Reserve		reserve
RestoreConfiguration		restoreconfiguration default
ResvRelRetryLim	6	set ResvRelRetryLim 10
Route		Route TargetA default 3
RouteDisplay		routedisplay iscsi
SASConnectorInfo		get sasconnectorinfo all
SASEnclosures (not supported on the ET 8200T)		sasenclosures
SASMapByTopology (not supported on the ET 8200T)	enabled	set sasmapbytopology enabled
SASPortList		sasportlist
SASTargets		sastargets
SaveConfiguration		saveconfiguration restart
SendEOMDeferredError	disabled	Set SendEOMDeferredError enabled
SerialNumber		get serialnumber
SNMP	disabled	set SNMP enabled
SNMPDumpEngineID		snmpdumpengineid
SNMPDumpMIB		snmpdumpmib
SNMPExtendedTraps	disabled	get snmpextendedtraps
SNMPTrapAddress	0.0.0.0 none	set snmptrapaddress 6 192.42.155.155 all
SNMPTraps	disabled	set snmptraps enabled
SNMPUsername		snmpusername
SNTP	enabled	get sntp
SNTPServer	MAIN - 129.6.15.30 AUX1 - 128.138.140.44 AUX2 - 128.138.141.172	set sntpserver 129.6.15.30
StopIdentifyLUN		StopIdentifyLUN default 3
Temperature		get temperature
Time		set time 03:32:30
TimeZone	EST (-05)	set timezone pst
Uptime		get uptime
Username	admin	set username Barbara
VerboseMode	enabled	set verbosemode disabled

Command explanations

AccessControl (OEM Configurable, Supported In-Band)

AccessControl enables or disables access control on a target node. Access to the target node is keyed to the iSCSI qualified name of whitelisted initiators.

```
set AccessControl [default | Target Name] [enabled | disabled]
get AccessControl [default | Target Name | all]
```

AccessEntry (OEM Configurable, Supported In-Band)

AccessEntry allows the addition or deletion of an initiator entry from the access control list of a target node. The initiator name must be formatted as an iSCSI qualified name and must be between 16 and 223 characters, is case sensitive and cannot be 'all'.

```
set AccessEntry [default | target name] [initiator name <delete>
| all [delete]]
get AccessEntry [default | target name | all]
```

BootEthernetDelay (OEM Configurable, Supported In-Band)

BootEthernetDelay sets the delay (in seconds) after startup before enabling the Ethernet ports. The value "0" disables the delay.

```
set BootEthernetDelay [0 - 255]
get BootEthernetDelay
```

BootOldestImage (Supported In-Band)

The BootOldestImage command allows the user to boot the appliance using the oldest stored flash image.

```
BootOldestImage
```

ClearCLIlog (Supported In-Band)

Clears the contents of the CLI command log.

```
ClearCliLog
```

ClearEventLog

ClearEventLog clears the contents of the event log.

```
ClearEventLog
```

ControllerLUN (OEM Configurable, Supported In-Band)

ControllerLun controls the automatic generation of a controller device at LUN 0.

```
set ControllerLun [enabled | disabled]
get ControllerLun
```

ControllerModel (Supported In-Band)

ControllerModel reports the specific model and firmware information to the CLI.

```
get ControllerModel
```

ControllerName (OEM Configurable, Supported In-Band)

ControllerName provides a descriptive ASCII name assigned to the unit. This field is used by applications to identify individual units. The specified name can be up to a maximum of 32 characters. If the name contains spaces, it must be enclosed in quotation marks. Unlike other non-immediates, changes to ControllerName take effect immediately.

```
set ControllerName [name]
get ControllerName
```

CoreDumpInfo (Supported In-Band)

Displays information concerning a core dump stored by a prior fault.

```
CoreDumpInfo
```

DataMoverStats (OEM Configurable, Supported In-Band, Not supported on the ET 8200T)

Displays statistics on aggregate data copied by the Data Mover. Shows the previous hour and minute. Use "all" to display statistics over the entire 24 hour period.

```
get DataMoverStats [all]
```

Date (Supported In-Band)

Date sets/displays the current date. The date range is 10/25/2016 to 01/18/2038.

```
set Date [MM/DD/YYYY]
get Date
```

DeleteAllMaps (OEM Configurable, Supported In-Band)

Removes all mapped devices from the map table. Upon the subsequent POST, if no maps are present the default maps will be loaded.

```
DeleteAllMaps
```

DisplayInitiators (Supported In-Band)

Displays a list of currently logged-in iSCSI initiators the target they are logged into and the transport type. No WWN.

```
DisplayInitiators
```

DPMTU (OEM Configurable, Supported In-Band)

DPMTU controls the MTU, or maximum transmission unit (Frame Size), used by the data port. Changes to these settings are applied when a SaveConfiguration command is executed.

```
set DPMTU [dp[n] | all] [576 – 9216]
get DPMTU [dp[n] | all]
```

DumpCLILog (Supported In-Band)

Dumps the contents of the CLI command log to the current CLI session. The column EvLog# is the current event log number as seen in DumpEventLog. The keyword EXCEPT indicates an exception occurred while processing the command, and the keyword RESTART indicates the unit was restarted.

```
DumpCLILog <NumEntries | all>
```

DumpConfiguration (Supported In-Band)

Dumps the system's configuration.

```
DumpConfiguration
```

DumpEventLog

DumpEventLog can be used to dump the contents of the event log to an RS-232, or telnet session. With no parameters, the last 2048 entries will be displayed. The optional parameter "all" specifies all entries will be displayed. An optional numeric parameter specifies the maximum number of entries to display from the end of the log.

```
DumpEventLog <NumEntries | all>
```

EmailFromAddress (OEM Configurable, Supported In-Band)

EmailFromAddress configures the email address that this system will use to talk to the email server. Full email address is a fully qualified Internet email address, not more than 128 characters long.

```
set EmailFromAddress [full email address]
get EmailFromAddress
```

EmailNotify (OEM Configurable, Supported In-Band)

EmailNotify turns on and off email notification. Default is disabled.

```
set EmailNotify [enabled | disabled]
get EmailNotify
```

EmailNotifyAddress (OEM Configurable, Supported In-Band)

EmailNotifyAddress configures notification addresses. Index is a number between 1 and 5, inclusive. Full email address is a fully qualified Internet email address, not more than 128 characters long. The level can be "all", "informational", "warning", "critical" or "none". This is the minimum level of severity in order for the event to trigger an email notification.

```
set EmailNotifyAddress [index] [full email address]
[warning level]
get EmailNotifyAddress <index | all>
```

EmailPassword

EmailPassword sets the password used to authenticate the login to the SMTP email server. The password must not be more than 64 characters. A password is not required if the email server does not require authentication.

```
set EmailPassword
```

EmailServerAddress (OEM Configurable, Supported In-Band)

EmailServerAddress configures the address of the server that should be contacted in order to send out emails. Either an IP address or a fully qualified domain (e.g. mail.myserver.com) may be specified.

```
set EmailServerAddress [IP address | name]
get EmailServerAddress
```

EmailUsername (OEM Configurable, Supported In-Band)

EmailUsername sets the username used to authenticate the login to the SMTP email server. The username must not be more than 128 characters. A username is not required if the email server does not require authentication.

```
set EmailUsername [username]
get EmailUsername
```

EthDCBX (Supported In-Band)

Toggles the status for DCBX link layer data protocol on the given data port(s). A reboot is required for changes to take effect. Choose 'auto' for auto-negotiate mode.

```
set EthDCBX [dp[n] | all] [auto | enabled | disabled]
get EthDCBX [dp[n] | all]
```

EthDpConnectorInfo (Supported In-Band)

EthDpConnectorInfo displays information about the specified Ethernet Data Port QSFP Connector. Valid connector names are DPO, DP1, etc.

```
get EthDpConnectorInfo [ethConn | all]
```

EthDpStats (Supported In-Band)

Displays port statistics for the selected data port.

```
get EthDpStats [dp[n] | all]
```

EthernetPort (OEM Configurable, Supported In-Band)

The EthernetPort command is used to enable or disable an ethernet port.

```
set EthernetPort [dp[n] | mp[n]] [enabled | disabled]
get EthernetPort [dp[n] | mp[n] | all]
```

EthernetSpeed (OEM Configurable, Supported In-Band)

EthernetSpeed determines the speed of any Ethernet port(s). If Auto is enabled then the Ethernet speed will be negotiated and the value in parentheses returned by the 'get' command indicates the current speed of the Ethernet connection. Changes to these settings are applied when a SaveConfiguration command is executed.

```
set EthernetSpeed [dp[n] [10Gb | 40Gb | auto] | mp[n] [100Mb | 1Gb | auto] | all auto]
get EthernetSpeed [dp[n] | mp[n] | all]
```

EthETS (Supported In-Band)

Sets the ETS bandwidth max percentage for the priority flow number where 0 means strict priority (ETS is disabled for that priority). The first percentage parameter applies to priority flow 0, the second to flow 1, etc. ETS bandwidths must be all 0 or add up to 100.

```
set EthETS [dp[n] | all] [%,%,%,%,%,%,%,%]
get EthETS [dp[n] | all]
```

EthFlowControl (Supported In-Band)

Sets the PAUSE frame behavior for the given port(s).

```
set EthFlowControl [dp[n] | all] [global | PFC | disabled]
get EthFlowControl [dp[n] | all]
```

EthPFC (Supported In-Band)

Toggles flow pause frames for the priority flow number on the given data port(s). Only takes effect if EthFlowControl for a port is set to PFC mode.

```
set EthPFC [dp[n] | all] [0-7] [enabled | disabled]
get EthPFC [dp[n] | all]
```

EthPFCBitmap (Supported In-Band)

Sets flow pause frames for the priority flows on the given data port(s) using the bit map provided. Only takes effect if EthFlowControl for a port is set to PFC mode.

```
set EthPFCBitmap [dp[n] | all] [0-0xff]
get EthPFCBitmap [dp[n] | all]
```

EthPortList

Lists the available Ethernet ports and their current status. Valid status values are: Up or Down

```
EthPortList
```

Exit

Exit terminates the current CLI session over SSH. This command has no effect if used during a serial RS-232 session connection.

```
Exit
```

FirmwareRestart (Supported In-Band)

FirmwareRestart resets and reinitializes the firmware.

```
FirmwareRestart
```

FlashImages (Supported In-Band)

FlashImages displays the metadata for software images currently stored in the Flash device. The optional parameter "validate" also validates the CRC of the flash images. Note that the CRC validation causes a multi-second delay.

```
FlashImages <validate>
```

Help (Supported In-Band)

The Help command issued with no parameters displays a list of available CLI commands. When a CLI Command name is specified, a command usage string and command description is presented on the CLI.

```
Help <command name>
```

HttpsCertInfo (Supported In-Band)

Displays information about the current HTTPS certificate.

HttpsCertInfo

HttpsCertParams (Supported In-Band)

Displays or sets the attributes used to generate the HTTPS certificate. All attributes are optional. C is Country with a fixed length of 2 characters. ST is State with a max length of 128 characters. L is Locality with a max length of 128 characters. O is Organization with a max length of 64 characters. OU is Organization Unit with a max length of 64 characters. CN is Common Name with a max length of 64 characters. Changes made to the HTTPS attributes will take effect on reboot.

set HttpsCertParams [C | ST | L | O | OU | CN] [nn...nn]
get HttpsCertParams

IdentifyController (Supported In-Band)

IdentifyController causes the 'Alert' LED to blink to enable identification of this system. Disable this option to cancel the blinking.

set IdentifyController [enabled | disabled]
get IdentifyController

IdentifyLUN (Supported In-Band)

Lights the LED of a disk drive associated with an iSCSI Target LUN.

IdentifyLUN [targetname] [lun]

Info (Supported In-Band)

Info displays version numbers and other product information for key components. Use the optional 'brief' parameter to show a more concise subset of system information.

Info <brief>

IPAddress (OEM Configurable, Supported In-Band)

IPAddress controls the current IP address of any Ethernet port(s). If IPDHCP is enabled, then the 'get' command reports the current IP address assigned by the network DHCP server, followed by the (DHCP) identifier. Changes to these settings are applied when a SaveConfiguration command is executed.

set IPAddress [dp[n] | mp[n] | all] [IP Address]
get IPAddress [dp[n] | mp[n] | all]

IPDHCP (OEM Configurable, Supported In-Band)

IPDHCP allows acquisition of an IP address from a network DHCP server. When this option is disabled, the IP address used will be specified by the IPAddress CLI command. Changes to these settings are applied when a SaveConfiguration command is executed.

set IPDHCP [dp[n] | mp[n] | all][IPv4 | IPv6] [enabled | disabled]
get IPDHCP [dp[n] | mp[n] | all] <IPv4 | IPv6 | >

IPDNSServer (OEM Configurable, Supported In-Band)

Controls the current DNS Server address. If IPDHCP is disabled, then this value must be manually set. Only the manually set DNS Server address is displayed.

set IPDNSServer [xxx.xxx.xxx.xxx]
get IPDNSServer

IPGateway (OEM Configurable, Supported In-Band)

IPGateway controls the current default gateways used by any Ethernet port(s). If IPDHCP is enabled, the 'get' command reports the current IP gateway assigned by the network DHCP server. Changes to these settings are applied when a SaveConfiguration command is executed.

set IPGateway [dp[n] | mp[n] | all] [IP Address]
get IPGateway [dp[n] | mp[n] | all]

IPSubnetMask (OEM Configurable, Supported In-Band)

IPSubnetMask controls the current subnet masks used by any Ethernet port(s). If IDHCP is enabled, the 'get' command reports the current IP subnet mask assigned by the network DHCP server. Changes to these settings are applied when a SaveConfiguration command is executed.

set IPSubnetMask [dp[n] | mp[n] | all] [xxx.xxx.xxx.xxx]
get IPSubnetMask [dp[n] | mp[n] | all]

IPv6Prefix (OEM Configurable)

IPv6Prefix controls the current IPv6 prefix of any Ethernet port(s).

set IPv6Prefix [dp[n] | mp[n]] [Prefix length]
get IPv6Prefix [dp[n] | mp[n] | all]

iSCSIAlias (OEM Configurable, Supported In-Band)

iSCSIAlias assigns a human-readable name to this system. Aliases may be 1 to 64 characters in length and may contain spaces if enclosed in quotes.

set iSCSIAlias [alias]
get iSCSIAlias

iSCSICHAP (OEM Configurable, Supported In-Band)

Specifies the type of CHAP (Challenge-Handshake Authentication Protocol) to be used for initiator logins. In 'One-way' authentication, the target authenticates the initiator using the 'in' CHAP secret, but the initiator does not authenticate the target. In 'Two-way' authentication, an additional level of security enables the initiator to authenticate the target using the 'out' CHAP secret. 'Disabled' means no authentication will be enforced and any initiator will have access to the target. If 'discovery' is specified, the selected CHAP authentication will apply to discovery sessions. NOTE: Access Control must be enabled on the target for CHAP authentication to occur.

set iSCSICHAP [default | Target Name | discovery] [disabled | one-way | two-way]
get iSCSICHAP [default | Target Name | discovery | all]

iSCSICHAPSecret (OEM Configurable, Supported In-Band)

Specifies the incoming and outgoing passwords for iSCSI CHAP sessions. Secrets are case sensitive, 12 to 32 characters, and cannot contain spaces. 'In' and 'out' secrets must be different for each name. The 'in' secret is for authentication of the initiator by the target. It is used for both one-way and two-way authentication. There is only one 'out' secret per target. The default account name for out secret is 'root'. If 'discovery' is specified, the setting will apply to CHAP during discovery sessions. There is a single account name for discovery CHAP, which is overwritten when the discovery account name is changed. NOTE: Access Control must be enabled and iSCSICHAP set to one-way or two-way for the CHAP secret to apply.

```
set iSCSICHAPSecret [default | target name | discovery] [in
[Account Name | all] | out [Account Name] | delete [Account
Name | all]] <Secret>
get iSCSICHAPSecret [default | target name | discovery] [in
[Account Name | all] | out [root]]
```

iSCSICongestionAlgorithm (OEM Configurable, Supported In-Band)

Switches the congestion algorithm for accelerated iSCSI traffic.

```
set iSCSICongestionAlgorithm [BBR | CUBIC | LBWC]
get iSCSICongestionAlgorithm
```

iSCSIDeletedTargets (Supported In-Band)

Displays a list of deleted iSCSI target names.

```
iSCSIDeletedTargets
```

iSCSIFastReTx (OEM Configurable, Supported In-Band)

Configures TCP fast retransmits for iSCSI connections.

```
set iSCSIFastReTx [enabled | disabled]
get iSCSIFastReTx
```

iSCSIReceiveAllocation (Supported In-Band)

Enables tuning of the advertised window size based on the expected number of initiators that will simultaneously access the bridge.

```
set iSCSIReceiveAllocation [1-64 | disabled]
get iSCSIReceiveAllocation
```

iSCSIRestoreDeletedTarget (Supported In-Band)

Enables the controller to automatically recreate a deleted iSCSI target after the next system reboot.

```
iSCSIRestoreDeletedTarget [target name | all]
```

iSCSISACK (OEM Configurable, Supported In-Band)

Configures TCP Selective ACK for new iSCSI connections. Selective ACK must be configured on both the host and the target in order to be enabled. This command only affects new connections. To change existing iSCSI connections use the host to log out, then log back in.

```
set iSCSISACK [enabled | disabled]
get iSCSISACK
```

iSCSITarget (OEM Configurable, Supported In-Band)

iSCSITarget creates/deletes an iSCSI target. The target name is appended to the standard iSCSI qualified name and may not exceed 16 characters. The 'default' target cannot be deleted.

```
iSCSITarget [target name] <delete>
```

iSCSITargetCopy (OEM Configurable, Supported In-Band)

iSCSITargetCopy creates a copy of an iSCSI target.

```
iSCSITargetCopy [original target name] [copy target name]
```

iSCSITargetNameDisplay (Supported In-Band)

iSCSITargetNameDisplay displays the iSCSI target names.

```
iSCSITargetNameDisplay
```

iSCSITargetRename (OEM Configurable, Supported In-Band)

iSCSITargetRename renames an iSCSI target.

```
iSCSITargetRename [original target name] [new target name]
```

IsReserved (Supported In-Band)

IsReserved displays the reservation status of the current services session/interface.

```
IsReserved
```

LoginRetentionTimeout (OEM Configurable, Supported In-Band)

Sets the delay (in seconds) after initiator logout before the logout is fully cleaned up. The value "0" disables the delay.

```
set LoginRetentionTimeout [0 - 300]
get LoginRetentionTimeout
```

MaxOpTemp (OEM Configurable, Supported In-Band)

Regulates/displays the maximum enclosure temperature alarm of the XstreamCORE in degrees Celsius. If the temperature of the XstreamCORE rises above the maximum MaxOpTemp, thermal control event handling occurs.

```
set MaxOpTemp [55-65]
get MaxOpTemp
```

MinOpTemp (OEM Configurable, Supported In-Band)

Regulates/displays the minimum enclosure temperature alarm of the XstreamCORE in degrees Celsius. If the temperature of the XstreamCORE falls below the minimum MinOpTemp, thermal control event handling occurs.

```
set MinOpTemp [0-30]
get MinOpTemp
```

OEMConfigFile (Supported In-Band)

Returns the "name" (the contents of the first record) of the OEM configuration file stored in persistent memory.

```
get OEMConfigfile
```

OpTempWarn (OEM Configurable, Supported In-Band)

Regulates/displays the number of degrees in Celsius before a warning is sent to the user.

```
set OpTempWarn [0-15]
```

```
get OpTempWarn
```

Password

Password specifies the password used for all sessions: SSH, SFTP and XstreamVIEW. The password must be 8 to 32 characters long, must contain at least one numeric character {0-9}, and may not contain the following: {space,tab,',\;,}.

```
set Password
```

Performance (Supported In-Band)

Returns system performance data for the user-specified data port(s). Data consists of the average rate (MB/s) and number of I/Os (IO/s) measured over the previous sampling period (approximately one second). Successful SCSI Read (28h, 88h, A8h) and Write (2Ah, 8Ah, AAh) commands are considered I/Os. Factors that may affect reported performance include port availability and saturation, transfer size, target device speeds, and overall system utilization.

```
get Performance <dp>
```

Ping (Supported In-Band)

Ping will send an ICMP echo request to the specified host.

```
Ping [dp[n] | mp[n]] [IP Address] <count <size>>
```

ReadOnlyPassword

ReadOnlyPassword specifies the password used for all sessions: SSH, SFTP and XstreamVIEW. The password must be 8 to 32 characters long, must contain at least one numeric character {0-9}, and may not contain the following: {space,tab,',\;,}.

```
set ReadOnlyPassword
```

ReadOnlyUsername (OEM Configurable, Supported In-Band)

ReadOnlyUsername specifies the username used for all sessions: SSH, SFTP and XstreamVIEW. Username must be all lowercase, 1 to 32 characters long, start with an alphabetical character, and may only contain the following: {a-z,0-9,-,_,.}.

```
set ReadOnlyUsername [username]
```

```
get ReadOnlyUsername
```

Reserve (Supported In-Band)

Prevents other CLI sessions from modifying the XstreamCORE. When the XstreamCORE services interface is reserved, set commands are unavailable to other sessions, but get commands

are available. Executing a SaveConfiguration or RestoreConfiguration command releases the XstreamCORE so that other CLI sessions may make setting changes.

```
Reserve
```

RestoreConfiguration (Supported In-Band)

Restores configuration to either the default configuration or the configuration last saved into non-volatile memory. The saved option undoes any changes made since the last save.

```
RestoreConfiguration [Default | Saved]
```

ResvRelRetryLim (OEM Configurable, Supported In-Band)

Sets the number of attempts after an initiator logout to retry failed reservation releases before resetting the target device. The value "0" disables retries.

```
set ResvRelRetryLim [0 - 128]
```

```
get ResvRelRetryLim
```

Route (8200) (OEM Configurable, Supported In-Band)

Route assigns a SAS or SATA destination device to an iSCSI protocol address on the specified target from the default target's map list. The device is mapped at the target's next available LUN. The "delete" identifier removes the map from the specified target. In verbose mode, overwriting a map requires secondary confirmation of the action.

```
Route <iSCSI> [target name] [default [LUN] | [LUN] delete]
```

Route (8200T) (OEM Configurable, Supported In-Band)

Route assigns a SAS or SATA destination device to an iSCSI protocol address on the specified target from the default target's map list. The "delete" identifier removes the map from the specified target. In verbose mode, overwriting a map requires secondary confirmation of the action.

```
Route <iSCSI> [target name] [LUN] [default [LUN] | delete]
```

RouteDisplay (Supported In-Band)

RouteDisplay will display a list of iSCSI to SAS address mappings. The optional 'Target Name' parameter will display all mappings for that target.

```
RouteDisplay <iSCSI> <target name>
```

SASConnectorInfo (Supported In-Band)

SASConnectorInfo displays information about the specified SAS connector. Valid connector names are A through D.

```
get SASConnectorInfo [sasConn | all]
```

SASEnclosures (Supported In-Band, Not supported on the ET 8200T)

Displays a list of attached enclosures. If no arguments are specified, only the enclosure summary table is displayed. If PHYID is specified, this displays connection details for active PHYs. If SlotMap is specified, device details for enclosure slots are displayed. EnclDx displays details for the specified enclosure.

SASEnclosures < [PHYID | SlotMap] <EnclDx>>

SASMapByTopology (OEM Configurable, Supported In-Band, Not supported on the ET 8200T)

SASMapByTopology specifies how target devices are mapped to LUNs. When enabled, LUNs are numbered based on the SAS topology, with gaps where there are open slots. When disabled, LUNs are assigned to devices as they are discovered, which may change over time.

set SASMapByTopology [enabled | disabled]

get SASMapByTopology

SASPortList (Supported In-Band)

Lists the status of all available SAS ports.

SASPortList

SASTargets (Supported In-Band)

Lists the physical devices that are connected to all SAS connectors and PHYs.

SASTargets

SaveConfiguration (Supported In-Band)

*Many commands require a SaveConfiguration command to be executed as indicated by the return Ready. *. When you invoke a SaveConfiguration command, the current configuration is permanently saved in the XstreamCORE and the new configuration becomes the active configuration. If a firmware restart is required to make the requested change permanent, you are asked to confirm the restart. You can override this request by indicating the override value on the command line. You may make several changes through commands before implementing the restart, but once you have restarted the XstreamCORE, all the command changes created before the restart and save are implemented. If you select the restart option, the XstreamCORE executes its complete start up cycle.*

SaveConfiguration <Restart | NoRestart>

SendEOMDeferredError

Controls early warning deferred errors generated by SpeedWrite. If there are issues with end of tape handling, enable this setting.

set SendEOMDeferredError [enabled | disabled]

get SendEOMDeferredError

SerialNumber (Supported In-Band)

Reports the XstreamCORE serial number. The serial number, unique for each XstreamCORE, is a 13-character field. The first seven alphanumeric characters are an abbreviation of the XstreamCORE name while the remaining six numbers are the individual XstreamCORE board number.

get SerialNumber

SNMP (OEM Configurable, Supported In-Band)

Enables/disables SNMP functionality.

set SNMP [enabled | disabled]

get SNMP

SNMPDumpEngineID

Dumps the SNMPv3 Engine ID of this device.

SNMPDumpMIB (Supported In-Band)

Dumps the contents of the specified private SNMP MIB to the current CLI session. If no parameter is specified, the Controller private MIB is dumped. For further assistance with SNMP, consult your network administrator.

SNMPDumpMIB <Controller | Product | ISCSI | SMI | TC>

SNMPExtendedTraps (OEM Configurable, Supported In-Band)

Enables and disables Extended (i.e., Device Error) SNMP trap functionality.

set SNMPExtendedTraps [enabled | disabled]

get SNMPExtendedTraps

SNMPTrapAddress (OEM Configurable, Supported In-Band)

Sets/displays the IP trap addresses and levels. Consult your network administrator for further assistance with SNMP.

Index: value between 1 and 6

IPAddress: standard IPv4 address for the host receiving messages; must be in the same subnet as the XstreamCORE

Trap Level: event severity required to trigger a trap

None: no traps are sent to configured IP addresses

All: traps are sent for all triggering events

Warning: only warning and critical events are sent

Critical: only critical events are sent

set SNMPTrapAddress [Index] [IPAddress] [Trap Level]

get SNMPTrapAddress <Index | All>

SNMPTraps (OEM Configurable, Supported In-Band)

Enables/disables SNMP trap functionality. Consult your network administrator for further assistance with SNMP.

set SNMPTraps [enabled | disabled]

get SNMPTraps

SNMPUsername

Sets the SNMPv3 username and password or displays the SNMPv3 username. The username must be 1 to 32 characters long, and may only contain the following: {a-z, A-Z, 0-9}. The password must be 8 to 32 characters long, and may only contain the following: {a-z, A-Z, 0-9}. SNMP must be enabled to run this command.

```
SNMPUsername  
get SNMPUsername
```

SNTP (OEM Configurable, Supported In-Band)

SNTP controls whether SNTP time server functionality is enabled.

```
set SNTP [enabled | disabled]  
get SNTP
```

SNTPServer (OEM Configurable, Supported In-Band)

SNTPServer sets/displays the IP addresses used to retrieve the SNTP time. Index range is 1-3 indicating the server slot to set/display. Enter 0.0.0.0 to disable a time server slot.

```
set SNTPServer [Index] [IP address]  
get SNTPServer <Index | All>
```

StopIdentifyLUN (Supported In-Band)

Stops lighting the LED of a disk drive associated with an iSCSI Target LUN.

```
StopIdentifyLUN [target name] [lun]
```

Temperature (Supported In-Band)

Displays the current internal temperature of the XstreamCORE in degrees Celsius.

```
get Temperature
```

Time (Supported In-Band)

Sets/displays the current time in a 24-hour format. If SNTP is enabled and at least one ethernet port is connected to a reachable SNTP time server, the time is retrieved from one of the configured SNTP time servers, and manual attempts to change the time will have no effect. If SNTP is disabled or SNTP server synchronization is not possible, the system time starts from XstreamCORE's last known system time stamp, and the time may be changed manually.

```
set Time [HH:MM:SS]  
get Time
```

TimeZone (OEM Configurable, Supported In-Band)

Sets/displays the time zone. Setting may be EST, CST, MST, PST, or a numerical offset from GMT in the format +/- HH. When SNTP is enabled, XstreamCORE applies the time zone setting to the time retrieved from a specified SNTP time server to determine the local time.

```
set TimeZone [[EST | CST | MST | PST] | [[+|-][HH]]]  
get TimeZone
```

Uptime (Supported In-Band)

Returns the time [days hrs:min:sec] since the last reboot.

```
Uptime
```

Username (OEM Configurable, Supported In-Band)

Specifies the username used for all sessions: SSH, SFTP and XstreamVIEW. Username must be all lowercase, 1 to 32 characters long, start with an alphabetical character, and may only contain the following: {a-z,0-9,-,_,.}.

```
set Username [username]  
get Username
```

VerboseMode (OEM Configurable, Supported In-Band)

Controls the level of feedback returned by the command line interface. Disabling this option removes CLI Help command descriptions and removes CLI command display headers and parameter names from get and immediate commands.

```
set VerboseMode [enabled | disabled]  
get VerboseMode
```

Appendix C Standards and Compliances

The equipment described in this manual generates and uses radio frequency energy. If this equipment is not used in strict accordance with the manufacturer's instruction, it can and may cause interference with radio and television reception.

Regulatory Notices

FCC Notices (US only)

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: • Reorient or relocate the receiving antenna. • Increase the separation between the equipment and receiver. • Connect the equipment into an outlet on a circuit different from that to which the receiver is connected. • Consult the dealer or an experienced radio/TV technician for help. Modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment under FCC rules.

Compliance with ICES-003

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Compliance with EN Regulations

Marking by the symbol  indicates compliance of this ATTO device to the EMC Directive and the Low

Voltage Directive of the European Union.



The ATTO XstreamCORE ET 8200 complies with Directive 2011/65/EC on the Restriction of the Use of Hazardous Substances in Electrical and Electronic Equipment RoHS2 (recast) and take the following exemptions:

6(c)- Copper allot containing up to 4% lead by weight.

7(a) -Lead in high melting temperature type solders (i.e. lead based alloys containing 85% by weight or more lead).

7(c)-I -Electrical and electronic components containing lead in a glass or ceramic other than dielectric ceramic in capacitors, e.g. piezoelectronic devices, or in glass or ceramic matrix compound.

UL60950-1/CSA C22.2 No. 60950-1

UL62368-1/CSA C22.2No.62368-1



The product has been certified and bears the Mark, as applicable, of the EMC and Product Safety authorities as indicated below:

Safety: TUV 72141224/72171382, EN 60950-1/62368-1, CE, CSA 60950-1, UL 60950-1/62368-1 CB IEC60950-1/IEC62368-1 (all national deviations)

Emissions/Immunity: **FCC Part 15 Class A**, ICES-003, CE - EN55032, EN55024, IEC61000-3-2, IEC61000-3-3

Appendix D Warranty Information

ATTO Technology, Inc. limited warranty

ATTO Technology, Inc. ("ATTO") warrants to the original purchaser of this product ("Product") that the Product is free from defects in material and workmanship for the term described for this specific Product on ATTO's website (www.atto.com). ATTO's liability shall be limited to replacing or repairing any defective product at ATTO's option. There is no charge for parts or labor if ATTO determines that this product is defective.

PRODUCTS WHICH HAVE BEEN SUBJECT TO ABUSE, MISUSE, ALTERATION, NEGLIGENCE, OR THOSE PRODUCTS THAT HAVE BEEN SERVICED, REPAIRED OR INSTALLED BY UNAUTHORIZED PERSONNEL WILL NOT BE COVERED UNDER THIS WARRANTY. DAMAGE RESULTING FROM INCORRECT CONNECTION OR AN INAPPROPRIATE APPLICATION OF THIS PRODUCT SHALL NOT BE THE RESPONSIBILITY OF ATTO. LIABILITY UNDER THIS LIMITED WARRANTY IS LIMITED TO ATTO PRODUCT(S). DAMAGE TO OTHER EQUIPMENT CONNECTED TO ATTO PRODUCT(S) IS THE CUSTOMER'S RESPONSIBILITY. THIS LIMITED WARRANTY IS MADE IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED. ATTO DISCLAIMS ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE TO THE EXTENT IMPLIED WARRANTIES CANNOT BE EXCLUDED, SUCH IMPLIED WARRANTIES ARE LIMITED IN DURATION TO THE EXPRESS WARRANTY PERIOD APPLICABLE TO THE PRODUCT. BECAUSE SOME STATES OR JURISDICTIONS DO NOT ALLOW LIMITATIONS ON THE DURATION OF IMPLIED WARRANTIES, THE ABOVE MAY NOT BE APPLICABLE. ATTO'S RESPONSIBILITY TO REPAIR OR REPLACE A DEFECTIVE PRODUCT IS THE SOLE AND EXCLUSIVE REMEDY PROVIDED TO THE CUSTOMER FOR BREACH OF THIS WARRANTY.

ATTO IS NOT RESPONSIBLE FOR DAMAGE TO OR LOSS OF ANY DATA, PROGRAMS OR ANY MEDIA. THE PRODUCTS ARE NOT INTENDED FOR USE IN: (I) MEDICAL DEVICES OR THE MEDICAL FIELD; OR (II) USE IN RUGGED APPLICATIONS.

ATTO IS NOT LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, IRRESPECTIVE OF WHETHER ATTO HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. NO ATTO DEALER, AGENT OR EMPLOYEE IS AUTHORIZED TO MAKE ANY MODIFICATION, EXTENSION OR ADDITION TO THIS WARRANTY.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.