ATTO Technology, Inc.

ATTO FibreBridge
Fibre to SAS Bridge
Troubleshooting Guide

1. OVERVIEW

This document describes troubleshooting techniques that can be used to identify and resolve issues associated with the ATTO FibreBridge 6500/7500.

Before continuing with this guide, verify that the latest firmware is installed. If you are experiencing an interoperability or protocol issue, chances are that other users have already reported the same thing. ATTO releases firmware updates numerous times a year and there is a good chance your issue has already been resolved. The latest firmware can be obtained from the "Download" section of the ATTO web site.

Also verify that you are using the latest versions of third party applications and storage devices.
In addition to the steps listed below, we highly recommend you explore the following additional technical resources:
Read the information posted in the support section of the ATTO web site [www.attotech.com/support]. The known issues and workarounds are listed.
The known issues section of the Product Release Notes document may also be helpful in identifying a potential issue. Product Release Notes can be obtained in the "Download" section of the ATTO web site.
The "Installation and Operations Manual" explains proper techniques and tips used for installation, operation, and configuration of the bridge. It also explains how the ATTO "ExpressNav" management GUI can be used to monitor operation of the FibreBridge and the connections to your storage targets. This manual can be found in the download section of the ATTO web site.
ATTO spends a great deal of time testing third party applications and products. This testing ensures that each supported configuration performs as indicated and operates successfully. Interoperability matrices are available in the support section of the ATTO web site. While these are not all inclusive, the listed products are a good baseline for assuring that they have been tested and should work in your system. Storage and system providers' web sites are the best sources for detailed configuration information including hardware and firmware/drivers/software for each component supported.

ExpressNav is a great utility that can be used to monitor the connections between the host and the FibreBridge and between the FibreBridge and your storage. It will list and provide details on each connected device. It will also allow you to configure the FibreBridge for specific modes of operation. However, changing these settings can have adverse effects. ATTO recommends you leave the settings at their default values unless instructed to change them by an ATTO Technical Support representative or you have advanced knowledge of the Fibre Channel and SAS protocols.

2. TROUBLESHOOTING TECHNIQUES

There are a few categories that failures can be placed in:
- Hardware: A component completely or intermittently fails.
- Interoperability: One or more devices in the system interpret the protocol specification different than the others resulting in undesirable behavior.
- Design: There is an error in the implementation of the software or firmware that prevents or limits functionality.
- User Error: The system is unable to achieve expected behavior due to improper installation or configuration or the desired behavior is simply not achievable due to unrealistic expectations.

Troubleshooting steps need to be taken to isolate hardware failures and user errors, which can easily be remedied by replacing a piece of hardware or changing something, from interoperability or design errors which could require code changes and take considerable time to resolve.

Some of the following techniques may seem simplistic or overly obvious, but these are the ones that are commonly overlooked and can take several hours of frustration to locate. It is important to try only one technique at a time. While changing multiple variables may seem to be a time saver, it usually complicates the troubleshooting process. The goal is to observe the issue and systematically isolate it to identify the least common factors that cause it to occur. If the problem goes away, there is no sure way of knowing what actually resolved it. If the problem does re-occur, you may have actually fixed it with one change, but another change may have caused a similar symptom.

3. OBSERVATIONS

Take a step back and think about what is being observed. Ask the following questions:
- Has the configuration been working and all of a sudden now fails? If you can absolutely assure that nothing has changed, the issue is most likely due to a hardware failure. However, there are some very subtle changes that could have been made (maybe by a colleague) that could affect overall system behavior. What has changed? Has the switch or storage firmware been upgraded? Has something been added or taken away? Even something as seemingly innocuous as an upgrade to disk drive firmware in a storage system can have unexpected effects.
- What is the observed behavior compared to the expected behavior? When reporting an issue to ATTO, try to observe and report the overall "high level" problem as well as the details. For example, an overall problem may be that drives disappear during heavy I/O. The details would include if the FibreBridge reported or logged an error when this occurred. Providing enough detail is important towards achieving a quick resolution.
- Is the problem repeatable? If yes, can it be repeated on a non-production test system? Collecting information such as system error logs is often needed. Since production systems are not generally set up to collect this information in normal operation, it is important to be able to configure the system to collect data and recreate the problem on a non-production test system.
- What do the status LEDs indicate? Refer to the appropriate product manuals to gain an understanding of what the LEDs indicate, but they are usually a good source of information towards identifying root cause.
- Once the problem is observed, attempt to determine where the problem originates. Begin by eliminating problem sources at a high level.

4. PROBLEMS DURING INITIAL SETUP

4.1 FibreBridge 6500/7500 fails to power on or become Ready

When the FibreBridge 6500/7500 is powered on, the power LED on the front panel should illuminate. The bridge begins a series of system checks and auto configuration before becoming ready. These processes take approximately 45 seconds after power up. After this time, the bridge 'Ready' LED should light.
If either the 'Power' or 'Ready' LEDs fail to illuminate, power off the unit and connect a serial cable to the FibreBridge 6500/7500 serial port. Attach the other end of the serial cable to a PC. Open a serial port connection to the bridge and begin 'logging' the serial port output. Power on the FibreBridge 6500/7500 and observe the bridge POST (Power On Self Test) messages for any errors.
- If the bridge appears to hang during POST and you do not see the 'Ready' prompt, wait 5 minutes to see if the bridge automatically reboots. If the bridge does reboot but continually fails POST after each reboot, stop logging the serial port output and contact ATTO Technical Support for an RMA to return the bridge for repair. Be prepared to provide the output from the serial port logging to ATTO support.
- If the bridge appears to hang during POST, the 'Fault' LED is illuminated, and the bridge does not reboot after the 5 minute timeout period, then the bridge may be faulty. Contact ATTO Tech Support and request an RMA to return the bridge for repair. Be prepared to provide the output from the serial port logging to ATTO support.

- If the bridge successfully boots and you see the 'Ready' prompt on the serial connection, issue the '**coredumpinfo**' CLI command to verify the coredump occurred recently (use 'Date/Time' field to determine if coredump is current).
- If the coredump is current, continue to the section on Obtaining FibreBridge 6500/7500 'coredump' file.
- If the coredump is not current, continue to the section on Forcing FibreBridge 6500/7500 to 'coredump'

4.2 Cannot find FibreBridge 6500/7500 in QuickNAV

- If your configuration PC is directly attached to the FibreBridge 6500/7500, verify the bridge Ethernet LEDs are lit and blinking.
- If your configuration is connected through a switch (or more than 1 switch), verify that both the configuration PC and the FibreBridge 6500/7500 have a valid link with the switch. Also if the PC and FibreBridge 6500/7500 are not on the same switch, verify that each switch has a valid path to the other switch.
- Verify that the Ethernet port you are connected to is enabled. Use CLI command "**get ethernetport mpN**" where "N" is the port number you are connected to. Use the "set" version of the command to enable the port if necessary.
- Reseat the Ethernet cable, then power cycle the bridge to force the bridge Ethernet port to auto-sense the cable type.
- Verify your cable is good. Replace with known good Ethernet cable.
- Verify that the Ethernet port speed is set to "auto" using the CLI command "**get ethernetspeed mpN**" where "N" is the port number you are connected to. Use "set" version of the command to set port to "auto".
- Verify all VPNs are disabled on the configuration PC.
- If the FibreBridge 6500/7500 network port is directly attached to an older Apple computer with 10/100 Ethernet port, verify you are using a straight through cable. A cross-over cable will not work in this configuration.
- If the Ethernet LEDs continue to fail to illuminate after the above steps and you still cannot see your bridge via QuickNAV, then the Ethernet port controller may be faulty. Before replacing the bridge, connect a serial cable to the bridge and follow the instructions in the section on Forcing FibreBridge 6500/7500 to 'coredump'.

NOTE: When changing any setting on the FibreBridge, the configuration must be saved by using '**saveconfiguration**' CLI command. The FibreBridge 6500/7500 will notify you if the system needs to be rebooted to initiate a change.

4.3 Cannot connect to FibreBridge 6500/7500 via Serial port

- Verify you are using a Cisco type serial port management cable (refer to FibreBridge 6500/7500 Installation and Operation Manual for wiring table). Verify your terminal session is connecting to the correct COM port on your configuration PC.
- Verify your serial port settings are set to the following settings:
  Baud Rate = 115200
  Data = 8 bits
  Parity = none
  Stop = 1 bit
  Flow Control = none
  Echo = On
- Using ExpressNAV GUI Advanced page or a Telnet session, verify the FibreBridge 6500/7500 serial port baud rate is set to 115200 using the "**get serialportbaudrate'** CLI command.

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5. EXPRESSNAV ISSUES

5.1 Cannot connect to ExpressNAV configuration GUI

- If you have a good link between two ports, but are unable to communicate directly between them or with other devices on the IP subnet, verify the following.
    o IP address is correct
    o Netmask is correct
    o Default gateway (if any) is configured and can be `pinged`
- If you are using Internet Explorer to connect, verify you are using the proper security settings:
    o Open your browser
    o Select Internet Options.
    o In the **Internet Options** screen, select the **Security** tab.
    o Click on the **Trusted Sites** icon.
    o Click on the **Sites** button.
    o In the text box "**Add this web site to the zone"**, add the IP address of the appliance. You may use wild cards.
    o Click on "**Add".**
    o Uncheck the "Require server verification" check box.
    o Click "**OK".**
    o At the bottom of the "**Internet Options"** box, click on "**OK"** and close the box.

5.2 ExpressNAV GUI images appear out of place or missing

- Verify Microsoft Internet Explorer is configured properly.
    o Go to the browser toolbar and select **Tools.**
    o Select Internet Options.
    o Select the **Security** tab.
    o Select the **Custom Level** button.
    o Go to the Miscellaneous topic and enable ALLOW METAREFRESH.

6. MY HOST DOES NOT SEE ANY OF MY DEVICES

When troubleshooting this kind of problem, the best approach is to troubleshoot using the inside-out method. You begin with the SAS device(s) connected to the bridge first and work your way out to the Fibre Channel nodes connected on the SAN.

6.1 SAS Devices:

NOTE: Use FibreBridge 6500/7500 "**sastargets**" command in the "Advanced" page in ExpressNAV or via telnet or serial port CLI to confirm that the FibreBridge 6500/7500 can see all SAS Devices. If all SAS devices appear in the "**sastargets**" output, proceed to the [FibreBridge Configuration](#) section below. If you are missing SAS devices in the "**sastargets**" list, then verify the following:

- Verify the SAS/SATA devices are powered on.
- Check cable integrity. Cables are the number one cause of problem in any SAS/SATA system. Cables that work on one SAS/SATA system does not necessarily mean they will work on all SAS/SATA systems. There are many low cost, but low quality cables that will not work well with the high speed signaling of the FibreBridge 6500/7500. Check the cables for solid connections. Try swapping the cables with known good ones. Verify the length of the cable is appropriate for the signal type and speed. Cables that are too long may result in intermittent drive issues.

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- Check the cables for solid connections. Make sure they are securely fastened to the SAS device(s). Use one of the following CLI commands to verify that the cables are properly detected by the FibreBridge 6500/7500.
  - For FibreBridge 6500 use "**get sasqsfpinfo**"
  - For FibreBridge 7500 use "**get sasconnectorinfo**"
- Use "**sasportlist**" CLI command to verify you have a valid link between the FibreBridge 6500/7500 and the SAS storage devices.
- Try attaching SAS/SATA devices one at a time with different cables, adding drives and cables until the problem occurs. This will help pinpoint the device or cable causing the problem.
- Watch the LED indicators on the SAS/SATA devices before, during, and after startup. Drive lights should also flash at startup as the SAS/SATA bus is scanned. This may give a clue as to the root cause of the issue.
- Try updating the firmware on the FibreBridge 6500/7500 as described in the "Installation and Operations" manual.
- If there is an Expander in the Array verify the following:
  - **Zoning**: Verify the Expander(s) are zoned properly so that the FibreBridge 6500/7500 and the SAS/SATA drives have access to one another. If there are pre-existing zones setup, be sure to add the FibreBridge 6500/7500 to the zone.
  - **Port Visibility**: Verify the Expander can see the FibreBridge 6500/7500 on the port(s) in question. Refer to the Expanders manufacturer's guide for more detail on this step.
  - **Speed Auto negotiation**: Verify the Expander is set to "Auto" negotiate transfer speed.
- If the FibreBridge 6500/7500 continues to not see SAS devices, you may have a faulty bridge. Before swapping the bridge for a new one, follow instructions in section: Forcing FibreBridge 6500/7500 to 'coredump'**.**
- This procedure will do two things:
  - It will force the bridge to reboot and force rediscovery of devices. When the bridge completes the reboot, check '**sastargets**' output to verify all devices are seen.
  - It will log the state of the bridge at the time of the issue to a file. The coredump file can help ATTO support determine why the bridge was not seeing all devices. Follow instructions in the section on Obtaining FibreBridge 6500/7500 'coredump' file for instructions on how to obtain the file and send it to ATTO support.
- If the SAS devices appear to be in working order and the SAS devices are all listed in the '**sastargets**' CLI output, then move on to the FibreBridge Configuration section.

6.2 FibreBridge Configuration

6.2.1   SAS Device Mapping

- Verify that the SAS devices are mapped properly. Use the '**routedisplay fc'** CLI command to show mappings.
- Follow instructions in the section on Forcing FibreBridge 6500/7500 to 'coredump'**.** This procedure will do two things:
  1. It will force the bridge to reboot and force re-mapping of devices. When the bridge completes the reboot, check '**sastargets**' output to verify all devices are seen.
  2. It will log the state of the bridge at the time of the issue to a file. The coredump file can help ATTO support determine why the bridge was not mapping the devices properly. Follow instructions in the section on Obtaining FibreBridge 6500/7500 'coredump' file for instructions on how to obtain the file and send it to ATTO support.

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6.2.2   FibreBridge Fibre Channel Connectivity:

Check FibreBridge 6500/7500 Fibre Channel Link LEDs are illuminated. If you do not see the link lights, check the following items:

- Issue "**fcportlist**" CLI command to verify port status is consistent with LED status.
- Check Fibre Channel cable integrity. Check cables for solid connections. Try swapping cables.
- If the FibreBridge 6500/7500 is attached to a switch, check to see if a valid connection is made via the switch nameserver.
- Issue '**get fcdatarate all**' to verify that the FibreBridge 6500/7500 is set to 'auto'.
- Issue '**get fcconnmode all**' to verify that the FibreBridge 6500/7500 is set to 'ptp-loop'
- Auto-negotiation between the FibreBridge 6500/7500 and switch/HBA at the desired speed may not work properly on poorer quality cables and some older switches/HBAs. Many times this issue can be resolved by either forcing the host/switch or FibreBridge 6500/7500 to the desired speed using '**fcdatarate**' CLI command and/or desired connection mode using '**fcconnmode**' CLI command.
- Check for faulty SFP+ modules by installing a known good SFP+ in the FibreBridge 6500/7500.
- If the FibreBridge 6500/7500 continues to not connect to FC devices, you may have a faulty bridge. Before swapping the bridge for a new one, follow instructions in the section on Forcing FibreBridge 6500/7500 to 'coredump'**.**

*NOTE: When changing any setting on the FibreBridge, the configuration must be saved by using '**saveconfiguration restart**' CLI command. The FibreBridge 6500/7500 will notify you if the system needs to be rebooted to initiate a change.*

6.3 Switch Configuration

- Verify that the switch(es) are zoned properly so that the hosts and FibreBridge 6500/7500 have access to each other. If there are existing zones on the switch, the FibreBridge 6500/7500 must be added to the zones that require access to the bridge.
- Verify that the switch can see the FibreBridge 6500/7500 on the port(s) in question. See switch vendor's user's guide for more information.
- Verify that the switch port is set for auto detection of the data rate. Hard set to preferred speed if desired.
- Some switches cannot detect and convert loop / fabric (PTP) login. If your switch is one of those, make sure the FibreBridge 6500/7500 is set to the mode the switch supports using '**fcconnmode**' CLI command.

6.4 Fibre Channel Host Adapter Configuration

- Fibre Channel Host Adapters are adapters that appear as a type of storage controller to the host Operating System (OS). Configuration of these adapters is usually done though the vendor's own utility and not through the OS itself.
- Check cable integrity.
- Verify that the hosts are running the recommended driver and firmware level for the FC host adapter.
- Verify that the host is in the same zone as the FibreBridge 6500/7500.
- Some adapters do not automatically detect new devices, but have to be manually mapped. Check with the FC adapter vendor for further details.
- On rare occasions, on some older switches, auto negotiation between the host and the switch at the desired data rate and connection mode does not work properly. Many times this issue can be resolved by forcing the host and/or switch to the desired speed and/or connection mode.

7. PROBLEMS FLASHING FIRMWARE

- The FibreBridge 6500/7500 performs validations on the structure of the file. If it does not pass these validations, the file is rejected. The image file may be corrupted. Try downloading the image file again.

- The FTP session may have timed out during transfer due to a slow network connection, bad network cable, or high network traffic. Retry the transfer until successful in these cases. Sometimes using a different FTP client can help too.

8. FIBREBRIDGE 6500/7500 'FAULT' LED IS ILLUMINATED

1. If the FibreBridge 6500/7500 'Fault' LED is illuminated, it means that the bridge is in 'critical mode'.
2. Wait 5 minutes. If the 'Fault' is caused because the bridge is stuck in a loop, then the FibreBridge 6500/7500 will automatically reboot itself.
   - If the bridge reboots, wait for it to become 'Ready' then issue '**coredumpinfo**' CLI command to verify the coredump occurred recently (use 'Date/Time' field to determine if coredump is current).
     - If coredump is current, continue to the section on Obtaining FibreBridge 6500/7500 'coredump' file.
     - If coredump is not current, continue to the section on Forcing FibreBridge 6500/7500 to 'coredump'.
   - If the bridge does not reboot after the 5 minute timeout period, then the bridge may be faulty. Contact ATTO Technical Support and be prepared to give a detailed description of the issue and provide the appropriate coredump or event log files.

9. FIBREBRIDGE 6500/7500 SPONTANEOUSLY REBOOTED

If you noticed that the FibreBridge 6500/7500 has unexpectedly rebooted, issue "**dumpeventlog**" CLI command and search for the latest instance of: '**INFO Reset. Reason:**'
- If the reason code states "Power Cycle", "FirmwareRestart Command" or "Extended POST Complete" then there is no problem with the bridge. You can continue operation.
- If the reason code does not state "Power Cycle", "FirmwareRestart Command" or "Extended POST Complete" and it is preceded by **'INFO Exception occurred'** then issue the '**coredumpinfo**' CLI command to verify coredump occurred recently (use 'Date/Time' field to determine if coredump is current).
  - If coredump is current, continue to the section on Obtaining FibreBridge 6500/7500 'coredump' file.
  - If coredump is not current, continue to the section on Forcing FibreBridge 6500/7500 to 'coredump'

10. FORCING FIBREBRIDGE 6500/7500 TO 'COREDUMP'

WARNING: If the FibreBridge 6500/7500 has spontaneously rebooted or 'Faulted', DO NOT force a coredump. If you do, you will overwrite all information about the reboot or 'Fault' event. Therefore, if you encounter a bridge reboot or 'Fault' condition, wait for the bridge to complete the reboot
1. Using a terminal emulation program with logging capabilities, connect to the bridge via serial port or telnet.
2. Issue '**info**' CLI command. **Note the FibreBridge 6500/7500 serial number which will be needed in step 3 of the section on** Obtaining FibreBridge 6500/7500 'coredump' file**.**

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3. In CLI type '**coredump**' command. The system will fault and reboot. This process may take up to 3 minutes.
4. Continue to the section on Obtaining FibreBridge 6500/7500 'coredump' file.

11. OBTAINING FIBREBRIDGE 6500/7500 'COREDUMP' FILE

1. FTP to the FibreBridge IP address.
2. Type '**dir**' command.
3. In the directory list, find the file with the extension MEM. The filename should be based off the serial number of the bridge. Use FTP 'get' command to save the MEM file to your local system. For example: 'get 0N1000172.mem'
4. Type '**bye**' to exit the FTP session.
5. Include the coredump file when sending issue information to ATTO support.
6. Continue to the section on Obtaining FibreBridge 6500/7500 eventlog to gather the bridge eventlog.

12. OBTAINING FIBREBRIDGE 6500/7500 EVENTLOG

1. Using a terminal emulation program with logging capabilities, connect to the bridge via serial port or telnet and begin a logging session to capture the terminal screen output to a file.
2. If connected via telnet, wait for 'Ready' LED to illuminate and reconnect to the FibreBridge 6500/7500. If connected via serial port, wait for the 'Ready' prompt.
3. Issue '**dumpconfiguration**' CLI command. Wait for 'Ready' prompt.
4. Issue '**dumpeventlog all**' CLI command. Wait for 'Ready' prompt.
5. Stop the logging session in your terminal.
6. Include the terminal output log and coredump file when sending issue information to ATTO support.
7. Contact ATTO Technical Support and be prepared to give a detailed description of the issue and provide the appropriate coredump or event log files.

13. CONTACT INFORMATION

You may receive customer service, sales information, and technical support by phone Monday through Friday, 8:00 am to 6:00 pm Eastern Standard Time, or by email and web site contact form.

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