



FXT Series Field Service Guide

Avere Systems, Inc.
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Chapter 1. Introduction

The *FXT Series Field Service Guide* is written for qualified service personnel who are familiar with the FXT Series product. Only those people who are familiar with the FXT Series products and are trained in the potential hazards involved with servicing this type of equipment should attempt the procedures in this guide. It includes information that is needed to remove and replace field-replaceable units, and to perform system maintenance procedures.

The procedures in this guide assume you have the following skills and experience:

- Working familiarity with accepted tools and procedures for safely installing, operating, and maintaining commercial information technology equipment
- Working familiarity with computer server hardware theory and operation
- Basic understanding of common networking concepts and practices

Use this guide after you familiarize yourself with the Avere FXT system by reading the following documents:

- *FXT Series Installation Guide*
- *Daily Operations Guide*

The Daily Operations Guide is written for system administrators who need to manage an Avere cluster. It assumes that you have a basic knowledge of networked storage, including network access protocols such as the Network File System (NFS) and the Common Internet File System (CIFS). It assumes that you have an Avere cluster installed and configured as described in the Quick Start Guide.

The following highlights are used in this document:



A warning indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury.



A caution indicates a potentially hazardous situation that, if not avoided, could result in minor or moderate injury.



A notice indicates information considered important, but not related to personal harm or injury.



A note presents commentary, sidelights, or interesting points of information.

Chapter 2. Precautions for Product Service and Use

This section discusses considerations you must take before servicing and using FXT Series edge filers.

2.1. Unpacking and Handling FXT Equipment

To prevent damage to the edge filer or components, carefully unpack and handle the FXT Series edge filer and components.

Inspect the boxes the edge filer or component was shipped in and note whether there is any damage. If the shipment shows evidence of damage, file a damage claim with the carrier that delivered it.

2.1.1. Restricted Access



The FXT Series edge filer nodes must be installed in a restricted-access location. A restricted-access location is defined as a location that can be accessed only by use of a tool, lock and key, or other means of security and is controlled by the authority responsible for the location. Anyone entering the restricted-access location, or installing or replacing modules in an FXT Series node, must be trained in the potential hazards associated with the FXT Series node, including but not limited to exposure to hazardous energy levels when the cover is removed, when modules have been removed, or when modules are being replaced.

2.1.2. Preventing Condensation



Condensation can occur when exposing a colder product to a warmer and/or more-humid environment.

If an item has been moved from an environment that is colder and less humid than the current installation and operating environment, allow it to reach the same temperature as the current environment before unpacking it, and before installing it or powering it on.

If you notice condensation on any part of the item, Avere Systems recommends a minimum of 24 hours for it to acclimate before installation and use.

2.2. Electrical Considerations

This section lists guidelines for safe electrical handling of the FXT Series edge filer node.

2.2.1. Electrical Code Compliance



To avoid the possibility of an electrical shock hazard, the electrical installation of an FXT Series edge filer and its associated rack(s) and power distribution units (*PDU*s) must comply with all applicable local, state, and national electrical codes and regulations. Contact a qualified electrician if you are unsure about proper electrical installation.

2.2.2. Earth Grounding



- The building site, rack, and PDU electrical receptacles powering the FXT Series edge filer must be properly grounded during the lifetime of the installation.
- The earth-ground connection for the rack must be designed and installed specifically for the rack, and must not rely solely on unintentional grounding connections made through FXT Series nodes and other equipment installed into the rack.
- The Avere FXT Series node has been approved only for use with TN-type earth grounding systems. It has not been approved for use with IT-type earth grounding systems. Do not connect the node to any non-TN type of earth grounding system.
- To avoid the possibility of an electrical shock hazard, the FXT Series edge filer must be properly connected to earth ground during the lifetime of the installation. The edge filer receives its earth ground connection through the AC power cords. To ensure the integrity of the ground connection, observe the following guidelines:
 - Use only power cords with a grounding plug.
 - Inspect the ground pins of each power cord before initial use.
 - Never remove or disable the grounding pin on a power cord or use an adapter that might affect the integrity of the ground connection.

2.2.3. AC Mains Disconnect



- The AC power cords serve as AC mains disconnect for the FXT Series edge filer and therefore must remain readily accessible during the lifetime of the installation.
- The FXT Series edge filer is provided with multiple power cords, and has a power-on/standby-type power switch. This switch does not function as an AC mains disconnect. To disconnect all power for maintenance or an electrical emergency, remove *all* power cords.

2.2.4. Power Supply Replacement



The power supply units for FXT Series nodes have detachable power cords. Disconnect the power cord at the power supply unit before removing it from the node. When installing a power supply unit, insert the unit into the node before connecting the power cord.



When running on a single power supply unit, the node has an increased probability of losing all power as a result of the single unit failing. Always replace a failed power supply unit as soon as possible after failure.

2.2.5. Hazardous Energy Levels



- To avoid potential injury, remove all chains, rings, watches, and other metal jewelry before performing maintenance on powered-on equipment. Burns and other injuries can be caused by the flow of current through a metallic object if the metallic object comes in contact with powered circuits.
- When replacing externally accessible components while power is applied to the node, *never* reach into the empty space created by the removed components, because hazardous energy levels may be present.

2.3. Racked FXT Series Nodes



To avoid the potential of serious injury and equipment damage, observe the following precautions before installing nodes into racks or before removing them from racks:

- Ensure that the node's weight is fully supported by two people at all times while it is being installed into or removed from a rack.
- The rack installation must be designed to remain stable while supporting the full weight of the installed equipment in its maximum extended position.
- Follow the rack manufacturer's recommendations and use the appropriate load calculator if available when designing and installing rack systems.
- Contact the rack manufacturer or an engineering consultant if you require assistance determining the stability of the rack for its intended purpose.
- For single-rack installations, specify and install stability options such as ballast kits, bolt-down kits, and extensible or permanent stabilizing mechanisms.
- In multiple-rack installations, specify and install a multirack tie-kit option. If the multirack tie kit is not sufficient to guarantee stability, then install ballast kits, bolt-down kits, and extensible or permanent stabilizing mechanisms.
- Unless the rack installation is designed otherwise, extend only one piece of equipment from the rack at a time.
- Install the first piece of equipment into the bottom of the rack, with future equipment installed above that.
- For installing multiple pieces of equipment at the same time, first install the heavier equipment at the bottom, then install the lighter equipment sequentially above that.

2.4. General Precautions

Observe the following precautions to prevent injury to yourself and damage to the FXT Series edge filer:

2.4.1. Service Area Clearance



To permit you to perform maintenance procedures on the FXT Series edge filer, a minimum of 24 inches of clearance must be provided in front of and behind the immediate area being serviced.

2.4.2. California Perchlorate Warning



This product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

The following notice is provided in accordance with California Code of Regulations Title 22, Division 4.5 Chapter 33. Best Management Practices for Perchlorate Materials. This product includes a lithium manganese dioxide battery that contains a perchlorate substance.

Perchlorate Material – special handling may apply. See www.dtsc.ca.gov/hazardouswaste/perchlorate.

2.4.3. Two-Person Lift



Each node weighs between 58 and 66 pounds (26.3 and 29.9 kilograms) and requires at least two people to lift and handle. When lifting a node, handle it in such a way that the weight is evenly distributed and stabilized. Be sure to comply with any personal lifting limits that may be in effect for your locale.

2.4.4. Battery Replacement



DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER. DISPOSE OF USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.

ATTENTION. IL Y A RISQUE D'EXPLOSION SI LA BATTERIE EST REMPLACÉE PAR UNE BATTERIE DE TYPE INCORRECT. METTRE AU REBUT LES BATTERIES USAGÉES CONFORMÉMENT AUX INSTRUCTIONS.

The motherboard battery maintains clock and CMOS settings when the node is without power for any reason. Contact Avere Global Services if you suspect that the motherboard battery needs to be replaced.

First generation NVRAM adapters contain lithium-ion batteries. The NVRAM I adapters and batteries are not field-replaceable or user-serviceable. The NVRAM I adapter must be replaced as a complete assembly

by trained service personnel only. Do not attempt to replace or remove the NVRAM I adapter or the batteries on the adapter.

2.5. Laser Radiation

NOTICE

CLASS 1 LASER PRODUCT

FXT Series nodes that contain optical networking ports may emit invisible laser radiation from those ports. When no fiber-optic cable is connected, do not stare into the open apertures. In addition, install protective covers over any optical ports that will not have a cable connected.

Some models of the FXT Series node are equipped with a DVD-ROM drive. If you have a FXT Series node with a DVD-ROM drive, to prevent direct exposure to the laser beam and potentially hazardous radiation exposure, do not attempt to disassemble the drive, defeat its safety interlocks, or use the drive in any unconventional way.

2.6. Thermal Considerations

NOTICE

- FXT Series nodes use front-to-back cooling airflow. If the FXT Series node is installed in a rack, the installer is responsible for ensuring that adequate airflow is available through the rack to effectively cool the node.
- Environmental ambient temperature requirements apply to the area immediately around the node. For an node installed into an enclosed rack or a rack with perforated doors, the ambient temperature requirement applies to the area inside the rack or door, immediately around the node.
- Operating the FXT Series node in a rack with open EIA U spaces can cause unintended airflow paths and associated temperature inconsistencies. To maintain proper airflow and temperatures, cover all open rack spaces with blank panels.
- Ensure that the node cover is in place when the node is operating to assure proper airflow and cooling. Thermal damage to the system can occur if this practice is not strictly followed.
- Do not remove disk drives or power supply units unless a replacement component is immediately available. If you remove a replaceable component, replace it immediately after removing the original component to ensure proper airflow and cooling. Damage to the system can occur if this practice is not strictly followed.

2.7. Electrostatic Discharge (ESD) Precautions

NOTICE

An ESD event occurs when two objects with different electrical charges come into contact with each other. Electronic devices can be severely damaged by ESD.

When handling electronic modules such as disk drives, printed circuit boards (PCBs), and power supplies, observe the following basic ESD precautions to prevent damage.

- If possible, perform service or maintenance functions at an approved ESD-safe workstation.
- Do not unpack or install electronic modules without using a properly grounded wrist or heel strap.
- Keep all electronic modules such as power supplies, PCBs, and disk drives in their original ESD-protective packaging until you are ready to install them.
- Handle all electronic modules carefully. Do not touch connectors, contacts, or components leads.
- Ensure that electronic modules do not come into contact with insulators such as clothing and plastics.

Chapter 3. FXT Series Edge Filer Overview

The Avere *edge filer* is a cluster of network-attached storage (NAS) devices, called *nodes*, that is installed between one or more existing NAS devices and clients to increase file operation performance.

The node, the FXT Series platform, is a server that runs the Avere OS software. Each node in the series contains and uses multiple types of storage media. If a part fails, any combination of the following will happen:

- An alert will appear on the Avere OS Dashboard
- An LED will light on the node
- An alarm will sound.

For more information on alerts, refer to Chapter 9, *Monitoring the Cluster (Dashboard Tab)* of the *Daily Operations Guide*. For more information on LEDs, refer to the following sections:

- Section 3.3, “FXT 2x00 Series Nodes: Front and Rear Illustrations” on page 12.
- Section 3.4, “FXT 2x50, FXT 3xx0, or FXT 4xx0 Series Nodes: Front and Rear Illustrations” on page 13.
- Section 3.5, “LEDs for the FXT 2x00 Series” on page 19.
- Section 3.6, “LEDs for the FXT 2x50, FXT 3xx0, and FXT 4xx0 Series” on page 20.

Some devices can be replaced without opening the node. Refer to Chapter 10, *Unracking and Opening an FXT Node* on page 51 for more information on opening the node, and whether it is necessary for that part.

3.1. Field-Replaceable Units

The following FXT Series system-level units and components can be serviced in the field:

- Power supply units. Refer to Chapter 4, *Replacing Power Supply Units* on page 23.
- Data drives and system drives. Refer to Chapter 5, *Replacing Drives* on page 25.
- Fans. Refer to Chapter 6, *Replacing a Fan* on page 35.
- Motherboard batteries. Refer to Chapter 7, *Replacing the Motherboard Battery* on page 41.
- Complete node. Refer to Chapter 9, *Replacing a Complete Node* on page 49.

Other components must be serviced at Avere Systems.

3.2. Attaching a Console to an FXT Series Node

Attach a console to the node’s serial port, either if the Avere Control Panel becomes unresponsive and SSH terminal access to a cluster or node fails, or if you have replaced a system drive on an FXT 3xx0 or FXT 4xx0, and thus need to update the boot settings.

➤ To attach the console:

1. Locate the serial (COM1) port on the rear of the appropriate FXT Series node, as shown in Section 3.3, “FXT 2x00 Series Nodes: Front and Rear Illustrations” on page 12 or Section 3.4.10, “Rear view of the FXT 2x50, FXT 3xx0, and FXT 4xx0 Series models” on page 18.



The serial port on the front of the FXT 2x00 Series node is the COM2 port. You cannot access the console by using this port.

2. Use a null modem cable to connect the COM1 serial port to a terminal configured for ANSI-115200-8N1.
3. Log in to the console.

3.3. FXT 2x00 Series Nodes: Front and Rear Illustrations

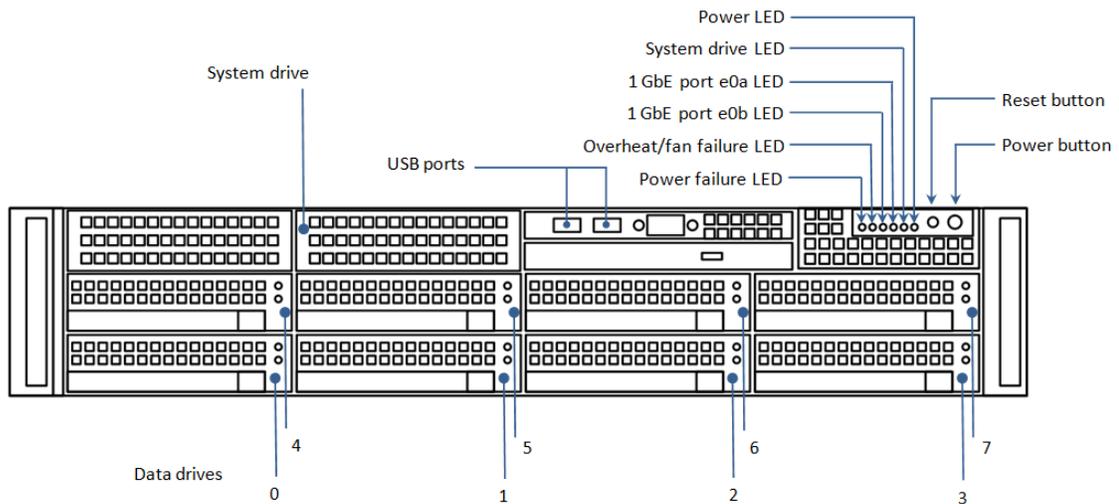


Figure 3.1. Front view of the FXT 2x00 Series node without bezel (all FXT 2x00 Series models)

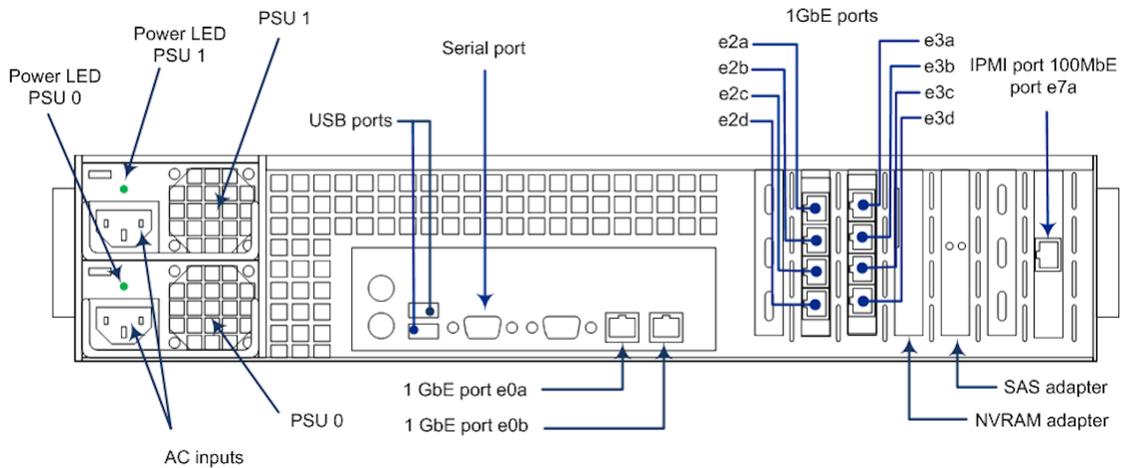


Figure 3.2. Rear view of the FXT 2x00 Series node with 1GbE network adapters

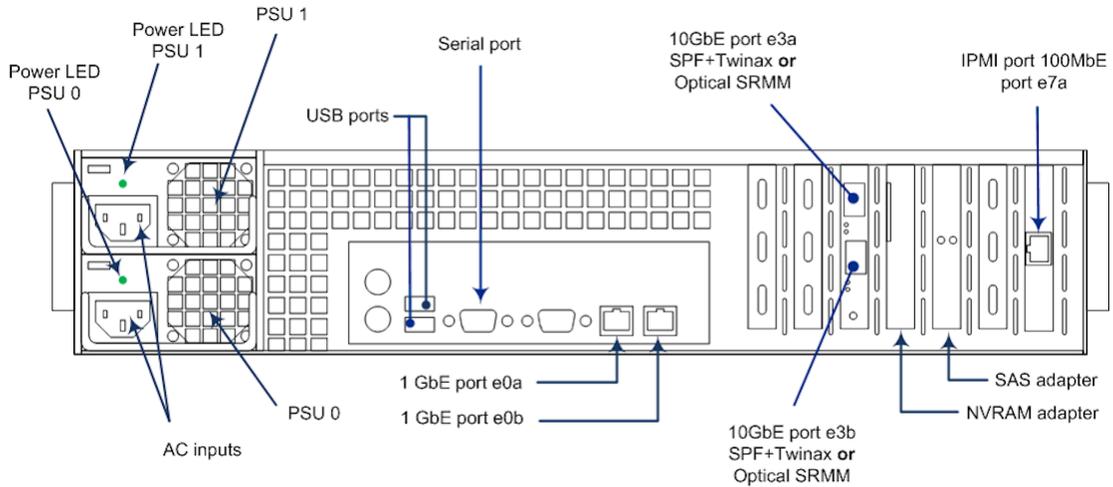
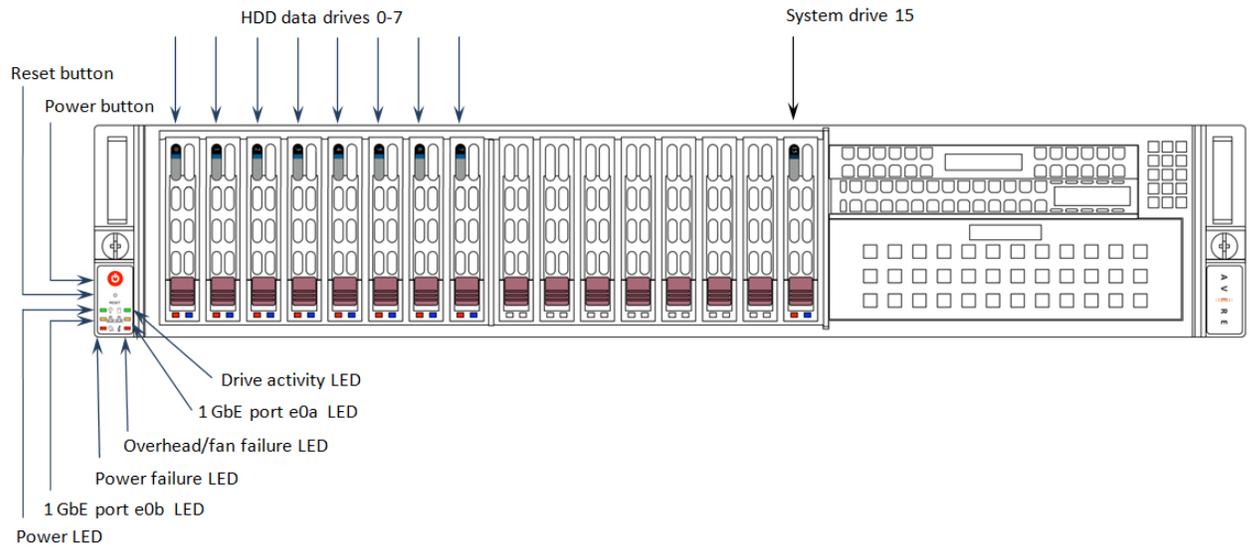


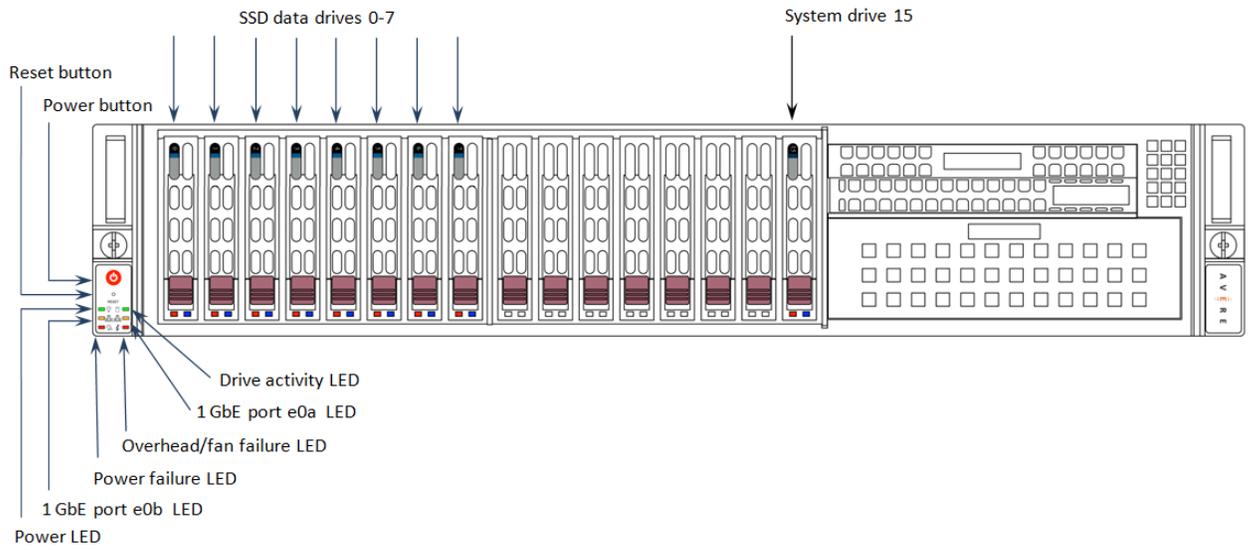
Figure 3.3. Rear view of the FXT 2x00 Series node without adapters

3.4. FXT 2x50, FXT 3xx0, or FXT 4xx0 Series Nodes: Front and Rear Illustrations

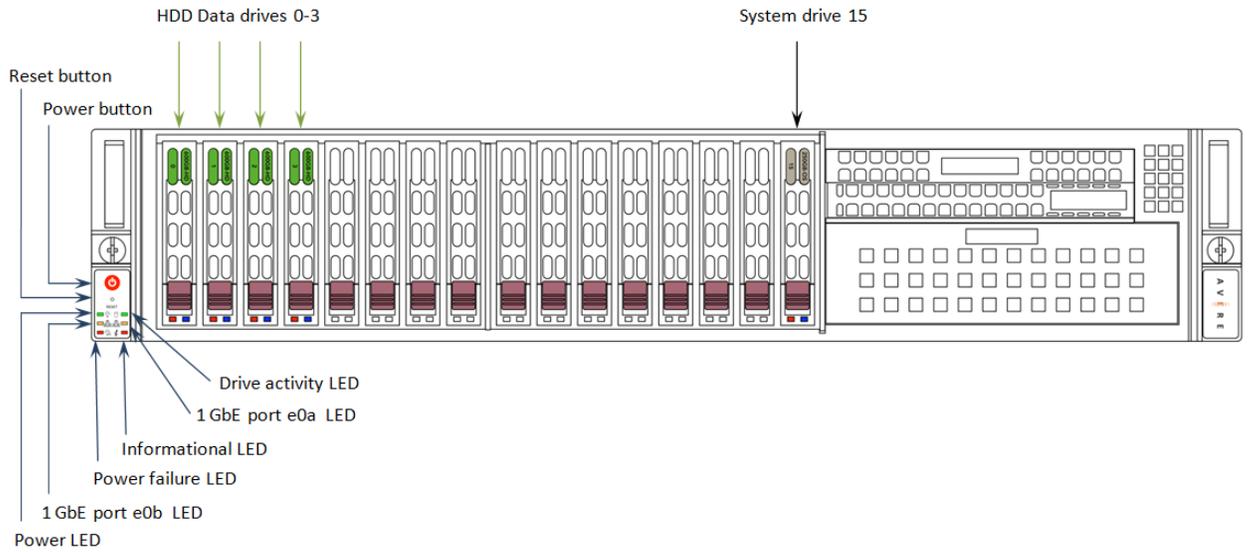
3.4.1. FXT 2x50 Front Illustration



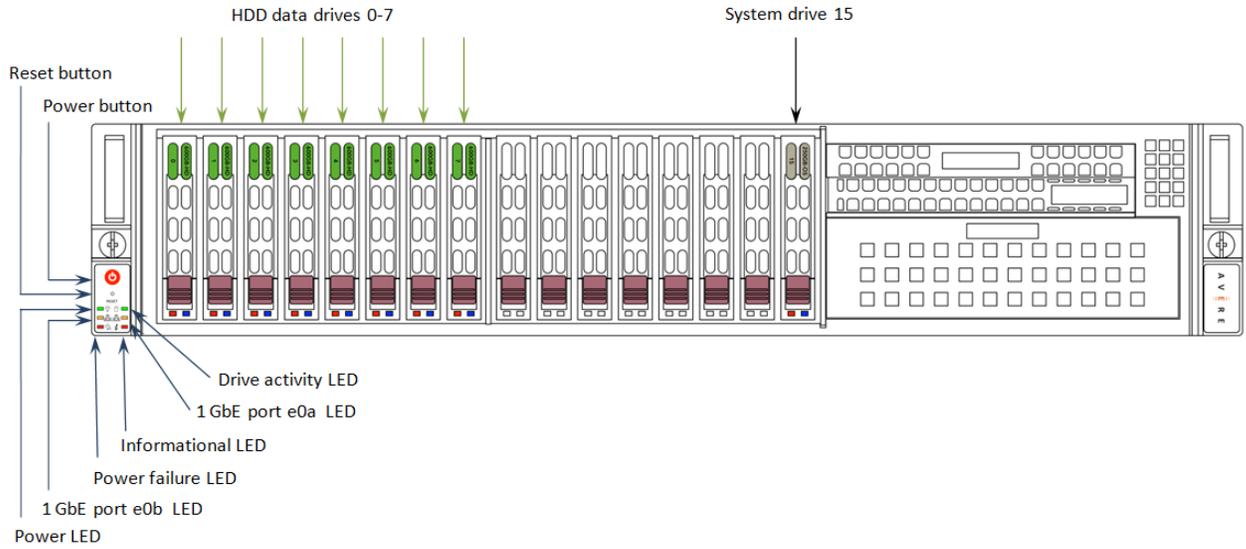
3.4.2. FXT 2750 Front Illustration



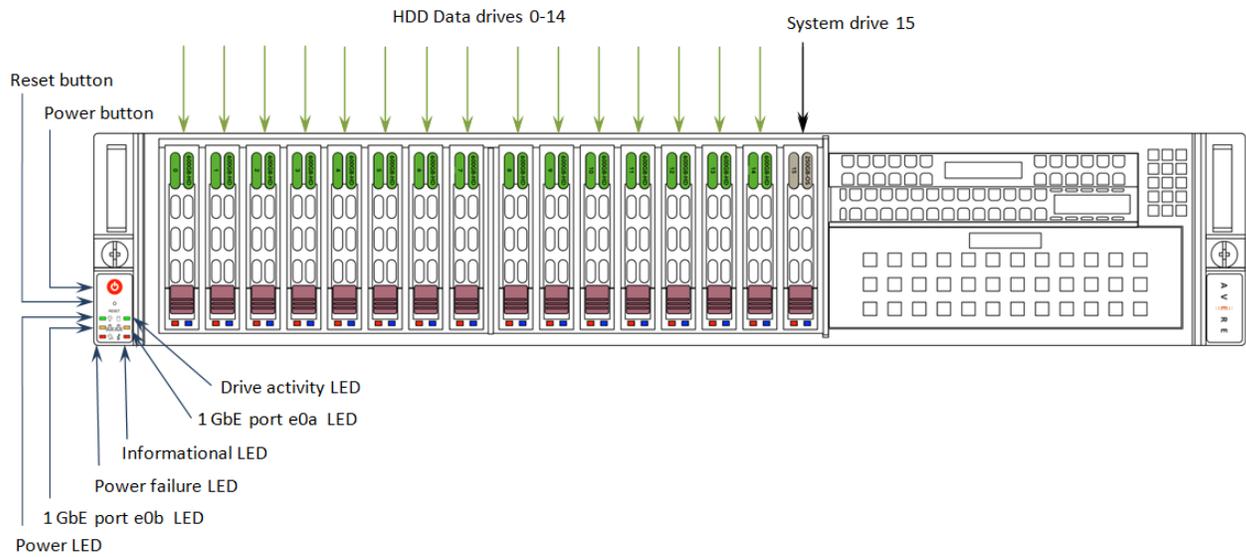
3.4.3. FXT 3100 Front Illustration



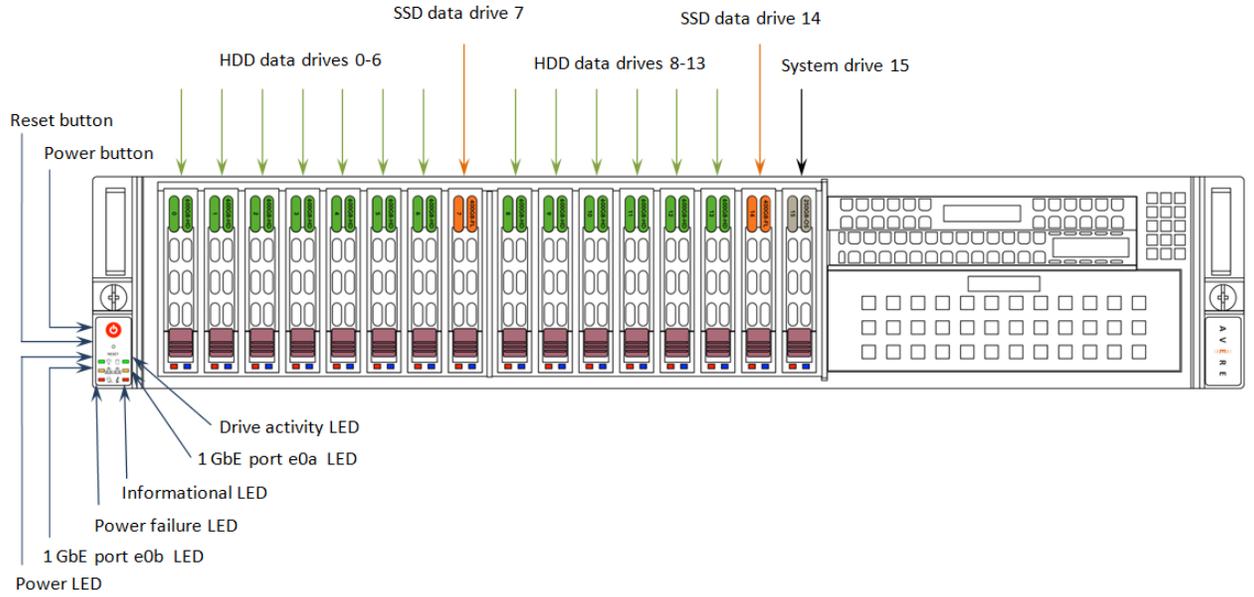
3.4.4. FXT 3200 Front Illustration



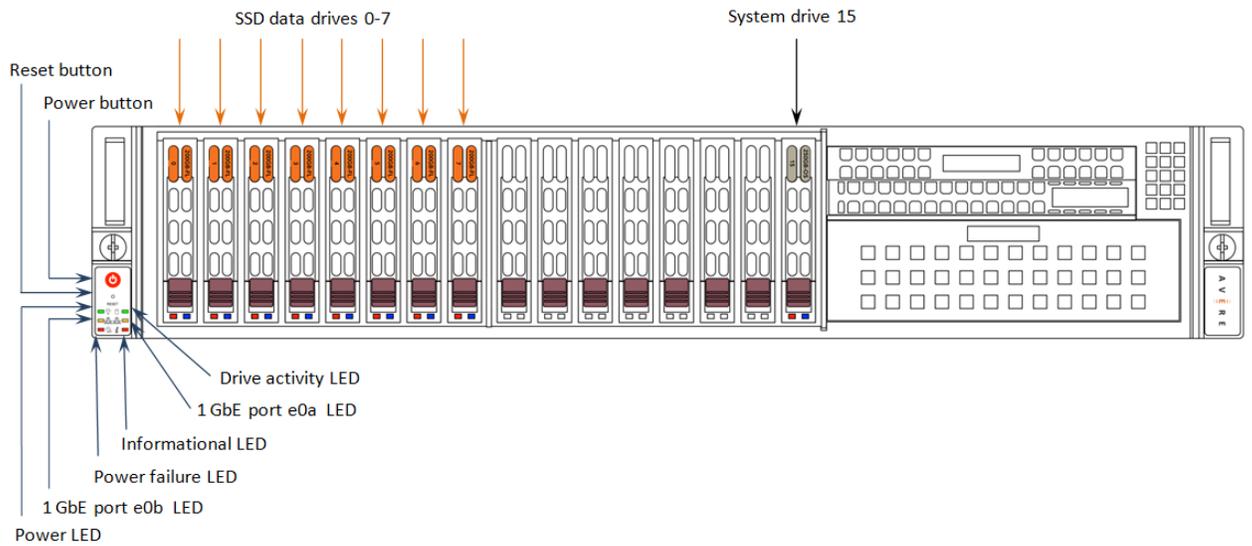
3.4.5. FXT 3500 Front Illustration



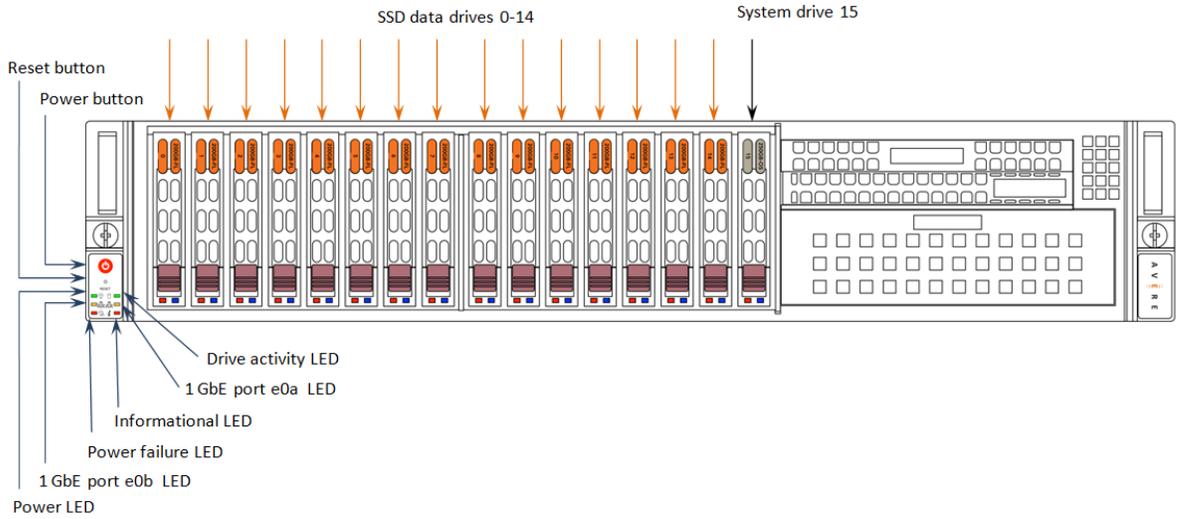
3.4.6. FXT 3800 and 3850 Front Illustrations



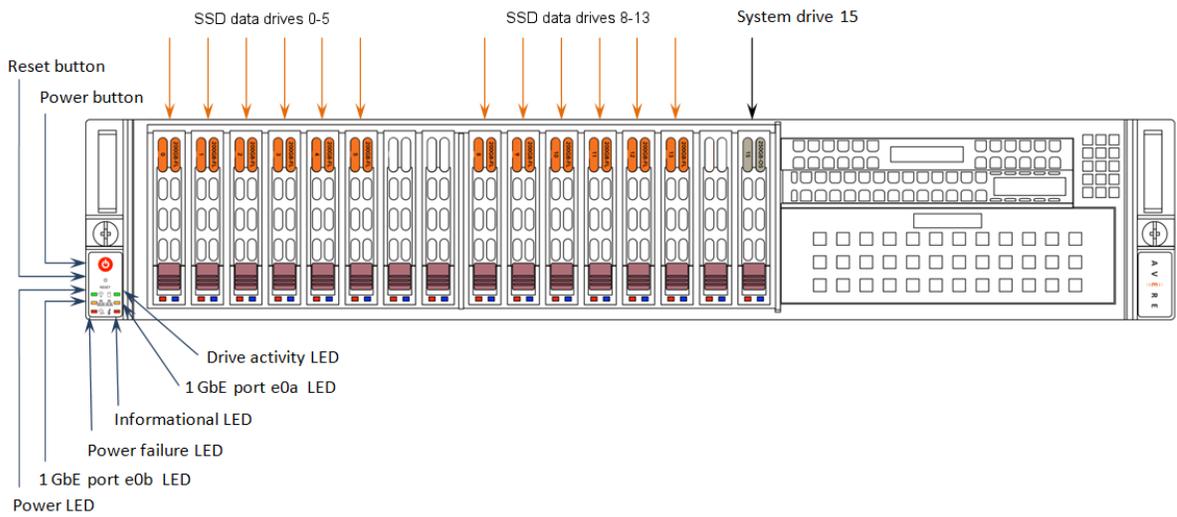
3.4.7. FXT 4200 Front Illustration



3.4.8. FXT 4500 Front Illustration

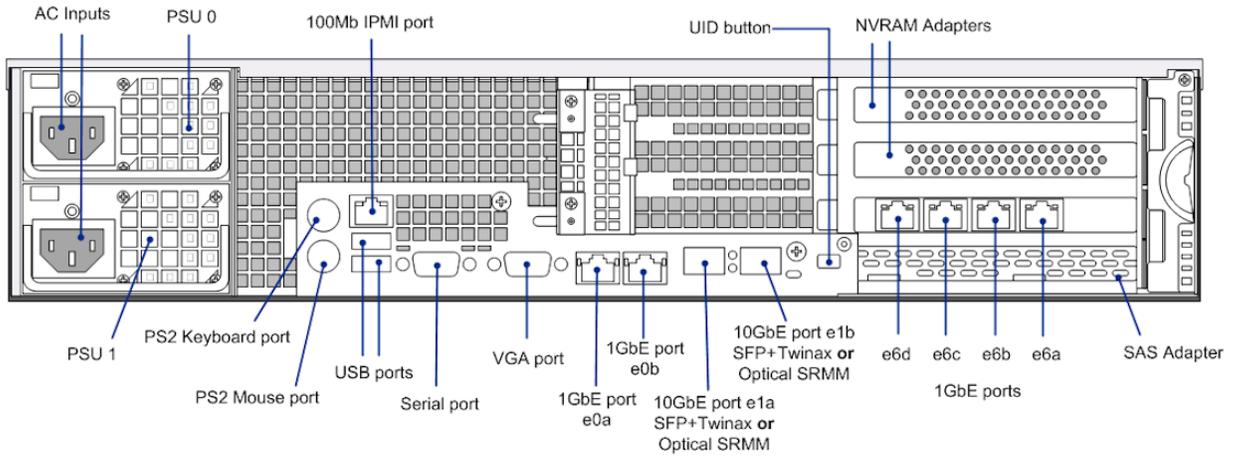


3.4.9. FXT 4800 and 4850 Front Illustrations



3.4.10. Rear view of the FXT 2x50, FXT 3xx0, and FXT 4xx0 Series models

The NVRAM adapter and PCIe clamp mechanisms may vary.



3.5. LEDs for the FXT 2x00 Series

This section describes the meanings of the LEDs on the FXT 2x00 Series; edge filer. See Section 3.3, “FXT 2x00 Series Nodes: Front and Rear Illustrations” on page 12 for the locations of LEDs.

| FXT 2x00 Series LEDs | | | |
|---|--|---|--|
| LED name | State | Meaning | Action (if applicable) |
| Front Panel | | | |
| Power LED | Green | Power is being supplied to the node’s power supply units. | N/A |
| | Unlit | Power is not being supplied to the node’s power supply units. | To power on the system, press the Power button. |
| Drive activity LED | Blinking amber | <ul style="list-style-type: none"> Activity on one or more data drives in slots 0 - 7. (All FXT Series) Activity on slot 15 (system drive) (FXT 2x50 Series only) | N/A |
| NIC1 LED | Blinking green | Ethernet port e0a is active. | N/A |
| NIC2 LED | Blinking green | Ethernet port e0b is active. | N/A |
| Informational LED (Overheat/fan fail LED on FXT 2x50 series) | Unlit | Cooling system is working properly. | N/A |
| | Blinking red, once per second | Fan failure. | Check for a failed fan. If needed, replace it as described in Chapter 6, <i>Replacing a Fan</i> on page 35 of the <i>FXT Series Field Service Guide</i> . |
| | Blinking red, once every four seconds (not on FXT 2x50 series) | Power failure. | Check for a failed power supply unit. If needed, replace it as described in Chapter 4, <i>Replacing Power Supply Units</i> on page 23 of the <i>FXT Series Field Service Guide</i> . |
| | Solid red | System temperature is too high. | Check ambient room temperature and correct if too high. Otherwise, contact Avere Global Services for assistance. |
| | Solid blue (not on FXT 2x50 series) | UID has been activated locally. | Use this LED to locate the server in a rack mount environment. |
| | Blinking blue (not on FXT 2x50 series) | UID has been activated from a remote location. | Use this LED to locate the server in a rack mount environment. |

3.6. LEDs for the FXT 2x50, FXT 3xx0, and FXT 4xx0 Series

This section describes the meanings of the LEDs on the FXT 2x50, FXT 3xx0, and FXT 4xx0 Series edge filers. See Section 3.4, “FXT 2x50, FXT 3xx0, or FXT 4xx0 Series Nodes: Front and Rear Illustrations” on page 13 for the locations of LEDs.

| FXT 2x50, FXT 3xx0, and FXT 4xx0 Series LEDs | | | |
|---|----------------|--|---|
| LED name | State | Meaning | Action (if applicable) |
| Power fail LED | Unlit | Both power supply units are working correctly. | N/A |
| | Solid red | A power supply unit has failed. The other power supply unit will continue to supply power to the node, but redundancy is lost. | Check for a failed power supply. If needed, replace it as described in Chapter 4, <i>Replacing Power Supply Units</i> on page 23 of the <i>FXT Series Field Service Guide</i> . |
| Data or System drive, right-hand LED | Unlit | Drive inactivity (SATA drives only) | N/A |
| | Blinking blue | Drive is being accessed (SAS or SATA drives) | N/A |
| | Solid blue | <ul style="list-style-type: none"> SAS drives – drive is either idle or being accessed SATA drives – drive is being accessed | N/A |
| Data or system drive, left-hand LED | Red | Drive failure. | Check for a failed drive. If needed, replace it as described in Chapter 5, <i>Replacing Drives</i> on page 25 of the <i>FXT Series Field Service Guide</i> . |
| Rear Panel | | | |
| Power Supply Unit LED | Green | The FXT Series node is powered on and the power supply unit is operating normally. | N/A |
| | Amber | Power is being supplied to the power supply unit but the FXT Series node is powered off. | To power on the system, press the Power button. |
| | Unlit | Power is not being supplied to the power supply unit. | Attach power cords and verify that power is available from the power source. |
| IPMI left-hand LED | Green | IPMI port is connected. | N/A |
| IPMI right-hand LED | Blinking amber | Activity on IPMI port. | N/A |
| 1GbE e0a or e0b, left-hand LED | Amber | Port is connected. | N/A |
| 1GbE e0a or e0b, right-hand LED | Blinking green | Activity on port. | N/A |
| 10GbE upper LED | Blinking green | Activity on port e1a | N/A |

FXT 2x50, FXT 3xx0, and FXT 4xx0 Series LEDs

| LED name | State | Meaning | Action (if applicable) |
|--------------------------------|-----------------|--|---|
| 10GbE lower LED | Blinking green | Activity on port e1b | N/A |
| 1GbE e6a-e6d left-hand LED | Amber | Port is connected at 1GbE. | N/A |
| | Green | Port is connected at 100MbE. | If connectivity speed is lower than expected, check network connections and infrastructure. |
| | Not illuminated | Port is connected at 10MbE. | If connectivity speed is lower than expected, check network connections and infrastructure. |
| | Blinking orange | Identity problem on the port. | Contact Avere Global Services if the condition does not clear itself. |
| 1GbE e6a-e6d right-hand LED | Blinking green | Activity on port. | N/A |
| | Solid green | Link established on port but no activity is occurring. | N/A |
| | Not illuminated | No link. | Check network connections and infrastructure. |

Chapter 4. Replacing Power Supply Units

This section describes how to detect and replace a failed power supply unit on an FXT Series node.



Before replacing a power supply unit, review the following warnings:

- Section 2.2.3, “AC Mains Disconnect” on page 5.
- Section 2.2.4, “Power Supply Replacement” on page 5.
- Section 2.2.5, “Hazardous Energy Levels” on page 5.
- Section 2.4.1, “Service Area Clearance” on page 7.

4.1. Detecting a Failed Power Supply Unit

An FXT Series node has two power supply units. If either unit fails, the other continues to provide full power to the node, which continues to operate without interruption.

During a single power supply unit failure, the node emits an audible alarm, the red “Power Fail” LED on the front of the node is illuminated, and a warning (yellow) alert indicating a power supply unit error appears on the Avere Control Panel’s Status page. These conditions will continue until the failed power supply unit is replaced.

The front “Power Fail” LED does not indicate which of the two power supply units has failed. As an aid to determining which unit has failed, check the LED above the node’s power cord connection. On a functioning power supply, the LED will be green. If the power supply has failed, the LED will be amber or off.

4.2. Replacing a Failed Power Supply Unit



You can replace a failed power supply unit without powering down the node.

➤ To replace a failed power supply unit:

1. Unplug the power cord from the failed power supply unit.
2. Wait one minute for the internal circuitry to discharge.
3. Press the red latch on the power supply unit to the right.
4. Use the unit’s handle to pull it straight out of the node.
5. With the red latch on the upper left, insert the replacement power supply unit into the node.
6. Push the replacement power supply unit into the power bay until the red latch engages.
7. Pull on the unit to ensure that it is properly seated in the node.
8. Plug the power cord into the newly replaced power supply unit.
9. Ensure that the “Power Fail” LED on the front of the node is no longer illuminated.
10. Log in to the Avere Control Panel and dismiss any alerts associated with the power supply unit failure.
11. Return the failed power supply unit to Avere Systems. Instructions for returning the failed unit are included in the replacement part’s shipping box, or can be emailed from Avere Global Services.

Chapter 5. Replacing Drives

This section describes how to detect and replace a faulty drive on an FXT Series node.

5.1. Identifying a Failed Data or System Drive

If a drive fails, an alert will appear on the Avere Control Panel's Dashboard, with text similar to the following:

- The storage device `Drivex` is reporting an error. Go to Node settings to reformat the node if a drive has to be replaced.
- Drive missing or down. (This will probably be in the alert Details.)

The drive ID is shown in the alert. Refer to Section 3.3, "FXT 2x00 Series Nodes: Front and Rear Illustrations" on page 12 and Section 3.4, "FXT 2x50, FXT 3xx0, or FXT 4xx0 Series Nodes: Front and Rear Illustrations" on page 13 for more information on the location of the drives.

When a replacement drive becomes available, locate the failed drive in the node. A failed drive typically has either no illuminated LEDs or an illuminated red LED. However, a drive can fail without the red LED being triggered.

Refer to Section 3.5, "LEDs for the FXT 2x00 Series" on page 19 and Section 3.6, "LEDs for the FXT 2x50, FXT 3xx0, and FXT 4xx0 Series" on page 20 for more information.



If you cannot locate the failed drive, contact Avere Global Services for assistance before proceeding.

5.2. Replacing Failed Data Drives

Perform the following steps to replace a data drive. Note that the illustrations are of FXT 2x50 Series, FXT 3xx0 Series, or FXT 4xx0 Series nodes, but the same mechanical principles apply to drives on FXT 2x00 Series nodes. FXT 2x00 Series nodes use horizontally installed 3.5-inch drives, while the other nodes use vertically installed 2.5-inch drives.



Note

If you do not have a replacement data drive immediately available, or you are using Avere OS 2.1.0.x, the node will need to be reformatted. This will allow the drive's node to participate in cluster operations until there is a drive available.

- If you are using Avere OS 3.1.x, automated drive failure recovery will often be enabled. If you see the following condition:

```
Node node_name has been reformatted to run without replacing failed drive drive_name. Please replace the failed drive as soon as possible. After replacing it, go to Node settings to reformat the node to include the replacement drive.
```

then the drive has automatically been removed from the node, and you do not need to manually reformat the node.

- If you are using Avere OS 2.1.0.x or 3.0, or if automated drive failure recovery is *not* enabled, you will need to manually reformat the node, as described in Section 5.2.2, "Reformatting a Node with a Failed Drive" on page 28.

5.2.1. Replacing a Failed Data Drive



Before replacing a failed data drive, review the following warnings:

- Section 2.2.5, “Hazardous Energy Levels” on page 5.
- Section 2.4.1, “Service Area Clearance” on page 7.



You can replace a failed data drive without powering down the node.

➤ To replace a failed data drive:

1. As shown in the following illustration, press the maroon button on the drive assembly of the failed drive to release it. A black lever is released from the front of the drive assembly.
2. Grasp the lever of the drive assembly and rotate it out to eject the drive.

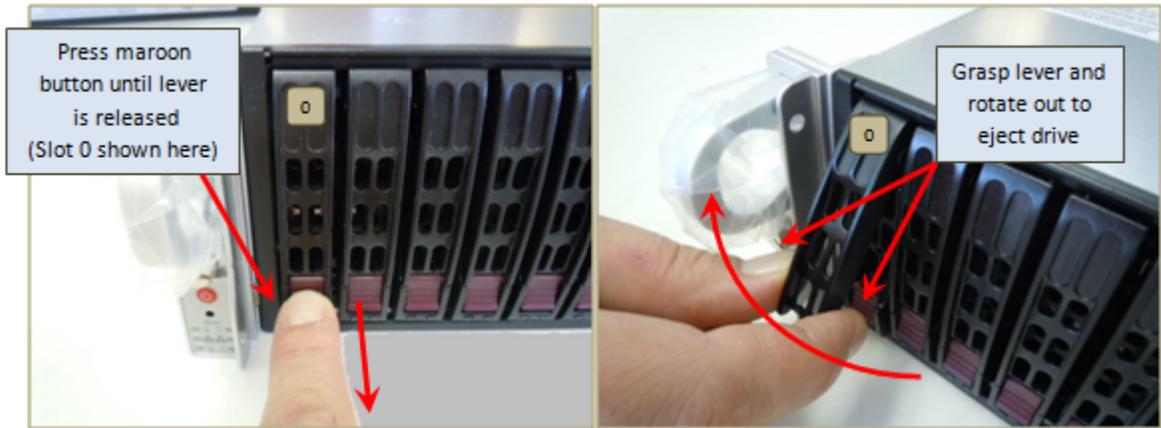


Figure 5.1. Unlatching a data drive

3. Use the lever to pull the assembly from the node, and note the number on the label applied to the assembly lever.
4. From the set of labels that is supplied with the replacement drive assembly, select the label with the same number as the drive being replaced.
5. Apply the numbered label to the lever of the replacement drive assembly in the same orientation and the same location as the original label. Press the label firmly to make sure that it sticks to the drive. See Section 3.3, “FXT 2x00 Series Nodes: Front and Rear Illustrations” on page 12 for an illustration of how drives are labeled.

6. As shown in the following illustration, insert the replacement drive assembly into the slot of the drive being replaced, then slide the assembly into the slot by pushing firmly on the bezel until the lever begins to close. Completely seat the drive assembly into place by pressing the replacement drive assembly's lever until it locks into place.

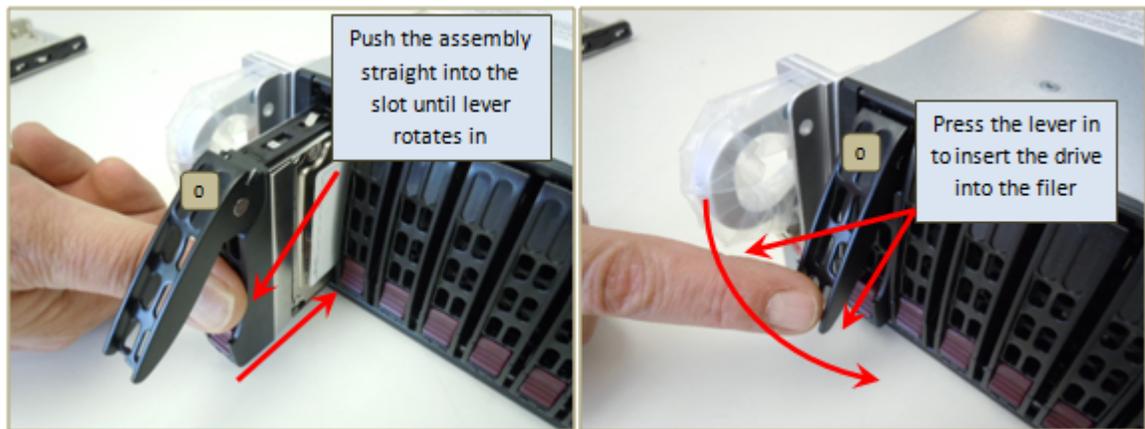


Figure 5.2. Inserting and latching a replacement drive

7. Ensure that the drive is seated correctly, as shown in the following illustration.

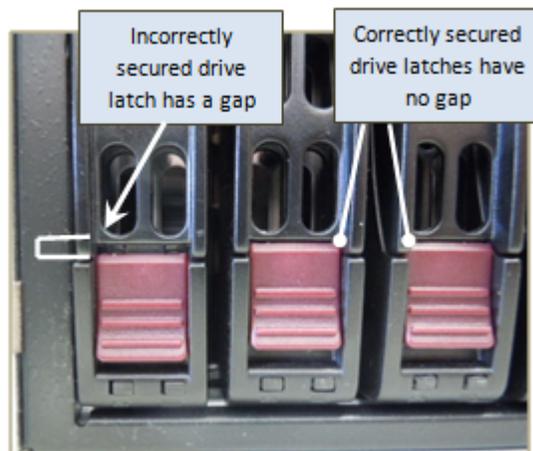


Figure 5.3. Correctly and incorrectly seated drives in an FXT Series node

8. Reformat the node, as described in Section 5.2.2, “Reformatting a Node with a Failed Drive” on page 28.
9. Return the failed drive to Avere Systems. Instructions for returning the failed drive are included in the replacement part’s shipping box, or can be emailed from Avere Global Services.

5.2.2. Reformatting a Node with a Failed Drive

If you do not have a replacement drive immediately available, you can reformat the node to remove it from the cluster, so that you can add the replacement drive at a later time. This will allow you to operate the node containing the failed drive in a “degraded” mode, with reduced capacity and performance.

➤ To reformat a node:

1. Navigate to the **FXT Nodes** page under the **Cluster** heading on the **Settings** tab.
2. Locate the nodes in your cluster in the **FXT Nodes** table.



Failed nodes will have the **Reformat** button available; this button will not appear in active healthy node listings.

The screenshot shows the Avere dashboard with a 'System Error' and 'ALERT' banner at the top. The 'Settings' tab is active, and the 'FXT Nodes' page is selected in the left sidebar. The main content area displays two tables:

| Name | Model | Status | Actions |
|--------|---------------------|---------------------|---|
| camant | FXT2300 | up | Modify settings, Restart services, Reboot, Power down, Remove, Offline, Suspend |
| vaunt | FXT3x00/4x00 Series | pending / bad drive | Modify settings, Restart services, Reboot, Power down, Remove, Reformat |

| Name | Address | Software Version | Status | Actions |
|-------|------------|------------------|---------------|---|
| armad | 10.1.2.242 | V3.0.0.1-1d69c4e | Wants to join | Allow to join, Upgrade software version |

Figure 5.4. Nodes (with healthy and failed drives) listed on the Dashboard

3. Choose **Reformat** for the failed node. The node will reboot as part of the reformatting process.

NOTICE

You might see a yellow alert that says “Drive from other node detected”. However, the node is still part of the cluster (running with one less drive) and working. If you have formatted the node in order to exclude the bad drive, you can ignore this alert and continue to use the cluster.

5.3. Replacing a Failed System Drive

This section describes how to replace a failed system drive on an FXT 2x00 Series node. Note that the procedure is different from the procedure for the FXT 2x50, FXT 3xx0, and FXT 4xx0 Series nodes.

5.3.1. Replacing a Failed System Drive on an FXT 2x00 Series Node



Before replacing a failed system drive, review the following warnings:

- Section 2.2.3, “AC Mains Disconnect” on page 5.
- Section 2.3, “Racked FXT Series Nodes” on page 6.
- Section 2.4.1, “Service Area Clearance” on page 7.



In addition, observe the following caution:

- Section 2.4.3, “Two-Person Lift” on page 7.

➤ To replace a failed system drive on an FXT 2x00 Series node:

1. Remove the node from the cluster, as described in Section 10.1, “Removing Nodes from and Adding Nodes to the Cluster” on page 51.
2. Turn off the node by pressing the power button on the front. The “Power” LED will either be not illuminated or illuminated red.



- The AC power cords serve as AC mains disconnect for the FXT Series node and therefore must remain readily accessible during the lifetime of the installation.
 - The FXT Series node is provided with multiple power cords, and has a power-on/standby-type power switch. This switch does not function as an AC mains disconnect. To disconnect all power for maintenance or an electrical emergency, remove *all* power cords.
3. Remove all power cords from the node.
 4. Remove the node from the rack, as described in Chapter 10, *Unracking and Opening an FXT Node* on page 51.
 5. Remove the node’s top cover as described in Section 10.3, “Opening the Node” on page 53.
 6. Locate the system drive. For more information, refer to Section 3.3, “FXT 2x00 Series Nodes: Front and Rear Illustrations” on page 12.

7. Remove the drive's combination data/power cable/connector, shown in the following illustration. No tools are required for this step.

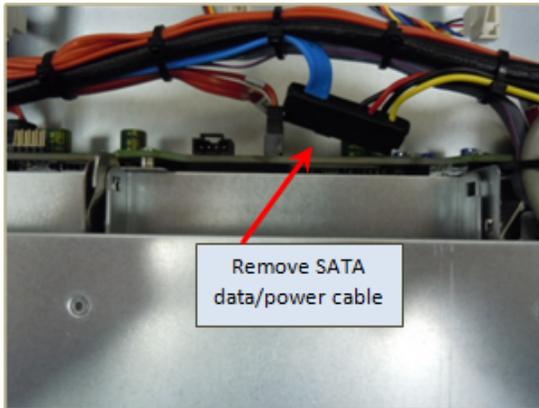


Figure 5.5. Removing system drive cables in an FXT 2x00 Series node

8. As shown in the following illustration, unlatch the drive and remove the failed drive's assembly.



Figure 5.6. Unlatching and removing the system drive assembly from an FXT 2x00 Series node

9. As shown in the following illustration, insert the replacement drive's assembly into the node and attach the SATA data/power cable to the replacement system drive.



Figure 5.7. Inserting an FXT 2x00 Series node's system drive and attaching the SATA cable

10. Verify that the replacement system drive is latched, as shown in the following illustration.

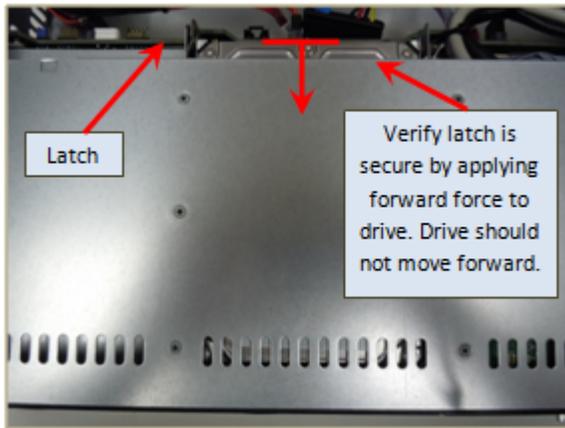


Figure 5.8. Latching an FXT 2x00 Series node

11. Replace the node's top cover as described in Section 10.4, "Replacing the Cover of the Node" on page 56.
12. Reinstall the node into the rack, as described in Section 10.5, "Reinstalling an Node into a Rack" on page 58.
13. Add the node back to the cluster, as described in Section 10.1, "Removing Nodes from and Adding Nodes to the Cluster" on page 51.
14. Return the failed drive to Avere Systems. Instructions for returning the failed drive are included in the replacement part's shipping box, or can be emailed from Avere Global Services.

5.3.2. Replacing a Failed System Drive on an FXT 2x50, FXT 3xx0, or FXT 4xx0 Series Node



Before replacing a failed system drive, review the following warnings:

- Section 2.2.5, “Hazardous Energy Levels” on page 5.
- Section 2.4.1, “Service Area Clearance” on page 7.

- To replace a failed system drive on an FXT 2x50, FXT 3xx0, or FXT 4xx0 Series node:
1. Remove the node from the cluster, as described in Section 10.1, “Removing Nodes from and Adding Nodes to the Cluster” on page 51.
 2. Turn off the node by pressing the power button on the front until the Power light turns off.
 3. As shown in the following illustration, press the maroon button on the drive assembly of the failed drive to release it. A black lever is released from the front of the drive assembly.
 4. Grasp the lever of the drive assembly and rotate it out to eject the drive.

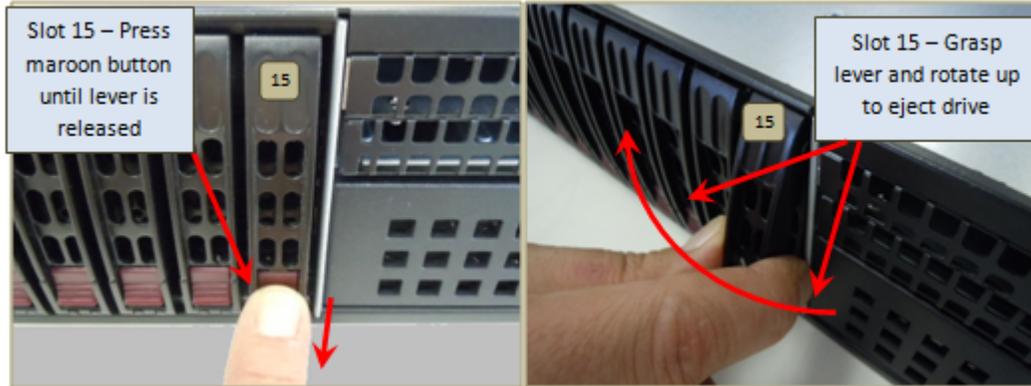


Figure 5.9. Unlatching and ejecting a system drive

5. Use the lever to pull the assembly from the node, and note the number on the label applied to the assembly lever.
6. From the set of labels that is supplied with the replacement drive assembly, select the label with the same number as the drive being replaced.
7. Apply the numbered label to the lever of the replacement drive assembly in the same orientation and the same location as the original label. Press the label firmly to make sure that it sticks to the drive. See Section 3.4, “FXT 2x50, FXT 3xx0, or FXT 4xx0 Series Nodes: Front and Rear Illustrations” on page 13 for an illustration of how the drives are labeled.

- As shown in the following illustration, insert the replacement drive assembly into the slot of the drive being replaced, then slide the assembly into the slot by pushing firmly on the bezel until the lever begins to close. Completely seat the drive assembly into place by pressing the replacement drive assembly's lever until it locks into place.

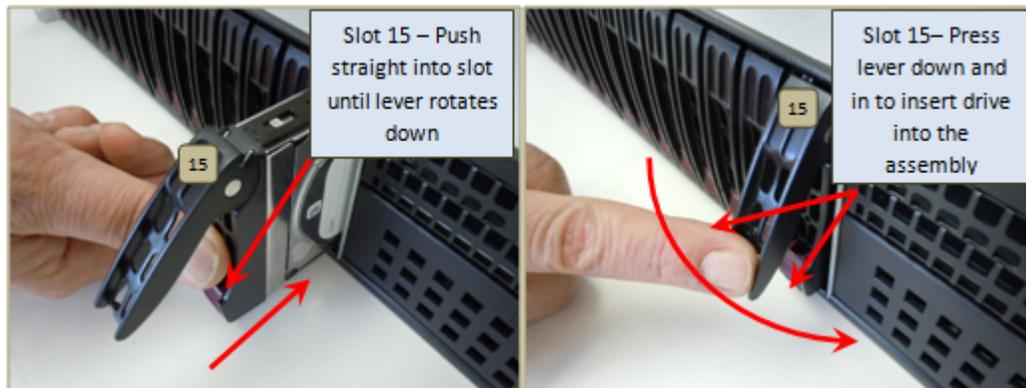


Figure 5.10. Inserting and latching a replacement drive

- Ensure that the drive is seated correctly, as shown in the following illustration.

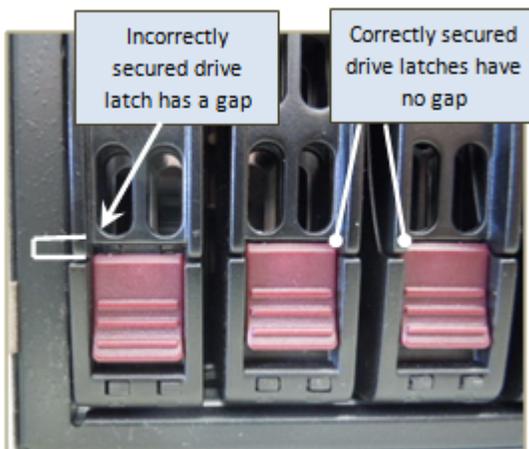


Figure 5.11. Correctly and incorrectly seated drives in an FXT 2x50 Series node

- If you have replaced a system drive in an FXT 3xx0 or FXT 4xx0 (not in an FXT 2x50) node, attach a console to the node, as described in Section 3.2, “Attaching a Console to an FXT Series Node” on page 11. This will allow you to update the boot settings.
- Power on the FXT node by pressing the power button on the front of the node.
- If you have replaced a system drive in an FXT 3xx0 or FXT 4xx0, update the boot settings, as described in Section 5.3.3, “Updating the Node Boot Settings” on page 34.
- Add the node back to the cluster, as described in Section 10.1, “Removing Nodes from and Adding Nodes to the Cluster” on page 51.
- Return the failed drive to Avere Systems. Instructions for returning the failed drive are included in the replacement part’s shipping box, or can be emailed from Avere Global Services.

5.3.3. Updating the Node Boot Settings

For FXT 3xx0 and FXT 4xx0 Series nodes *only*, you will need to update the BIOS, using an attached console.

1. Soon after the node starts booting, the LSI MFI BIOS will display information about the SAS controllers and attached drives. The following prompt appears at the end of this information:

```
Press <Ctrl><H> for WebBIOS or press <Ctrl><Y> for Preboot CLI
```

2. Press <Ctrl><Y> (CTRL key + Y key at the same time) to enter the Preboot CLI (command-line interface).

- **The prompt does not wait for input, so you must press the keys before the prompt times out (usually for 3-5 seconds).** If you miss this window, the node will try to network boot using PXE. Depending on your network configuration, the output will look like the following:

```
Intel(R) Boot Agent GE v1.3.24  
Copyright (C) 1997-2008, Intel Corporation
```

```
PXE-E61: Media test failure, check cable  
PXE-M0F: Exiting Intel Boot Agent.  
Reboot and Select proper Boot device  
Insert Boot Media in selected Boot device and press a key
```

In this case, reboot as shown in Step 4, and return to Step 1.

- If the command-line interface starts correctly, output similar to the following will be displayed:

```
MegaPCLI SAS RAID Management Tool.  
Copyright(c) LSI Corporation, 2008.  
Use -h -a<n> for controller specific help, where n is the controller index  
Use -v -a<n> for controller specific version, where n is the controller index  
Use q to exit from $ prompt
```

```
Controller(s) Found  
HA-0 (Bus 4 DevFn 0)  
HA-1 (Bus 5 DevFn 0)  
$
```

3. At the \$ prompt, enter the following exactly as shown, including the dash at the beginning:

- For an FXT 4800 or FXT 4850 node: `-AdpBootDrive -Set -L6 -aALL`
- For all other FXT 3x00 and FXT 4x00 Series nodes: `-AdpBootDrive -Set -L7 -aALL`

and press ENTER.



If this command fails, you might need to reboot the node to allow the new system drive to be imported by the controller. Use one of the methods described in Step 4, and return to Step 1 as the node reboots.

4. Reboot the node in one of the following ways:

- Press the reset button on the front of the node, as shown in the diagrams in Section 3.4, “FXT 2x50, FXT 3xx0, or FXT 4xx0 Series Nodes: Front and Rear Illustrations” on page 13.
- (VGA interface) Simultaneously press the <CTRL><ALT> keys.
- (IPMI interface) Use IPMI to reboot the node from a connected computer.

The node should now boot normally from the new system drive.

Chapter 6. Replacing a Fan

This section describes how to detect and replace a failed fan on an FXT Series node. An FXT Series node has three (FXT 2x00 Series) or four (FXT 2x50, 3xx0, and 4xx0 Series) internal fans to maintain proper airflow and cooling.



Before replacing a failed fan, review the following warnings:

- Section 2.2.3, “AC Mains Disconnect” on page 5.
- Section 2.3, “Racked FXT Series Nodes” on page 6.
- Section 2.4.1, “Service Area Clearance” on page 7.



In addition, observe the following caution:

- Section 2.4.3, “Two-Person Lift” on page 7.

6.1. Detecting a Failed Fan

If a fan fails, the red “Overheat/Fan fail” LED on the front of the node flashes until all of the node’s fans are working. A critical (red) alert indicating a fan failure appears on the Avere Control Panel’s Status page. These conditions will continue until the failed fan unit is replaced.



The “Overheat/Fan fail” LED lights up steadily if the internal temperature exceeds a preset limit. In this case, ensure that the temperature around the node is within the specifications listed in the *FXT Series Installation Guide*.



It is important to replace a failed fan as soon as possible. For more information, review the thermal considerations listed in Section 2.6, “Thermal Considerations” on page 8.

6.2. Replacing a Failed Fan

➤ To replace a fan:

1. Remove the node from the cluster, as described in Section 10.1, “Removing Nodes from and Adding Nodes to the Cluster” on page 51.
2. Turn off the node by pressing the power button on the front. The “Power” LED will either be not illuminated or illuminated red.



The FXT Series node is provided with multiple power cords, and has a power-on/standby-type power switch. This switch does not function as an AC mains disconnect. To disconnect all power for maintenance or an electrical emergency, remove *all* power cords.

3. Remove all power cords from the node.
4. Remove the node from the rack, as described in Chapter 10, *Unracking and Opening an FXT Node* on page 51.
5. Remove the node’s top cover as described in Section 10.3, “Opening the Node” on page 53.
6. Locate the failed fan. The locations of system fans are shown in the following illustrations.

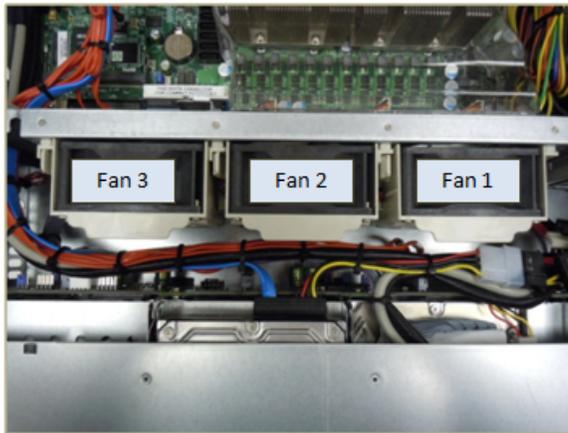


Figure 6.1. Fan locations in FXT 2x00 Series nodes

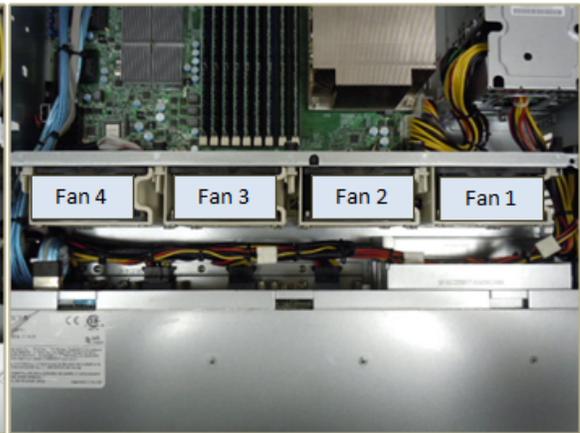


Figure 6.2. Fan locations in FXT 2x50, FXT 3xx0, and FXT 4xx0 Series nodes

7. Press the tab on the left side of the failed fan to unlock and remove the fan and its housing. The fan's power connections automatically detach. The following illustration shows the left-side fan being ejected and removed from an FXT 2x00 Series node.



Figure 6.3. Unlatching and removing a fan

8. Insert the replacement fan into the empty slot, as shown in the following illustration. Press down until the fan clicks into place.

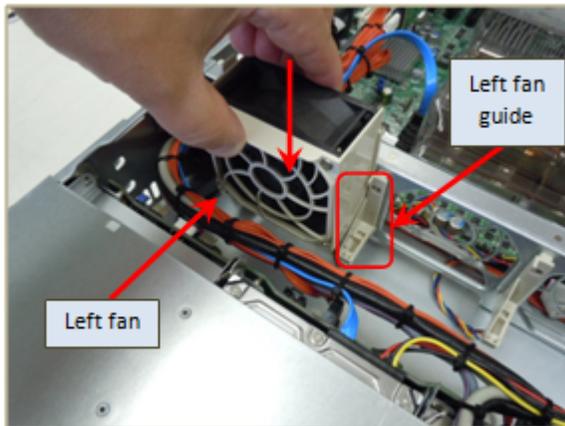


Figure 6.4. Installing a fan

9. Ensure that the replacement fan is latched correctly, as shown in the following illustrations. An incorrectly installed fan can work its way loose and disconnect, causing additional problems with the node.

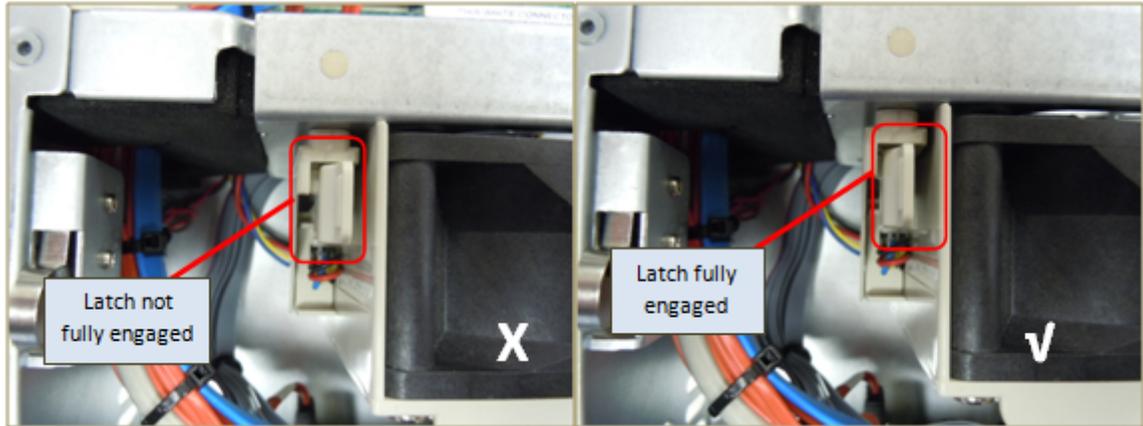


Figure 6.5. Badly latched fan in an FXT 2x00 Series node

Figure 6.6. Correctly latched fan in an FXT 2x00 Series node

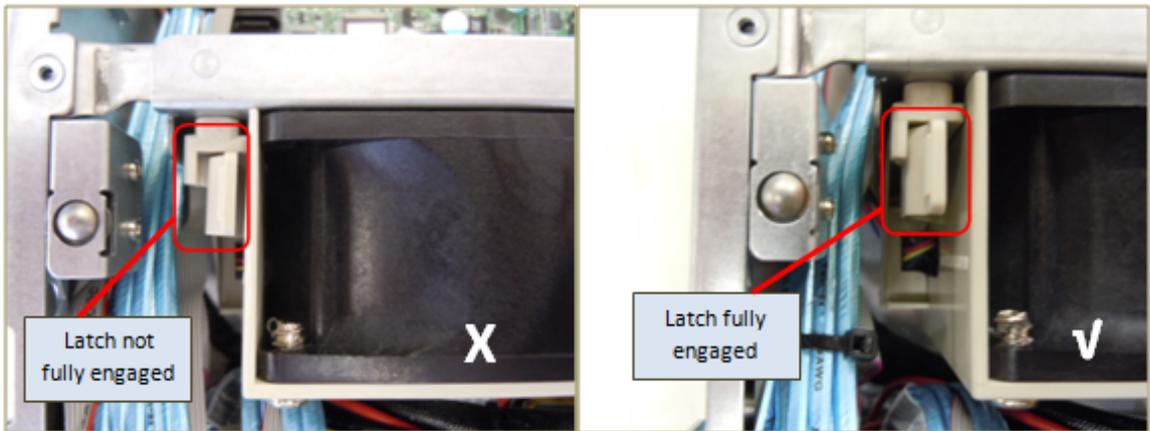


Figure 6.7. Badly latched fan in an FXT 2x50, 3xx0, or 4xx0 Series node

Figure 6.8. Correctly latched fan in an FXT 2x50, 3xx0, or 4xx0 Series node

The following illustration shows the three fans correctly installed in an FXT 2x00 Series node.

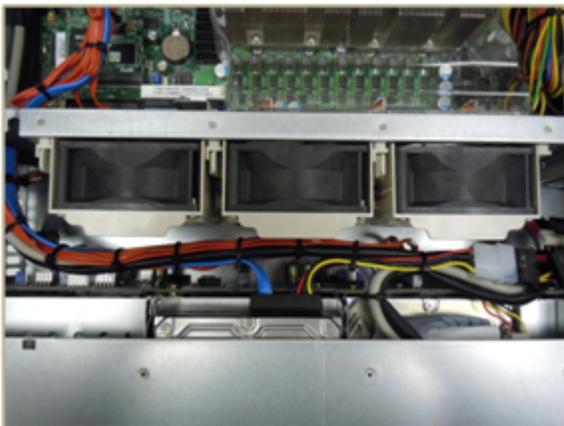


Figure 6.9. Installed fans

10. Replace the node's top cover as described in Section 10.4, "Replacing the Cover of the Node" on page 56.
11. Reinstall the node into the rack, as described in Section 10.5, "Reinstalling an Node into a Rack" on page 58.
12. Reattach all power cables, and power on the node by pressing the Power button on the front of the node.
13. Add the node back to the cluster, as described in Section 10.1, "Removing Nodes from and Adding Nodes to the Cluster" on page 51.

Chapter 7. Replacing the Motherboard Battery

This section describes how to replace the motherboard's onboard battery on an FXT 2x00 Series node. The motherboard battery maintains clock and CMOS settings when the node is without power for any reason.



Before replacing a failed data drive, review the following warnings:

- Section 2.2.3, “AC Mains Disconnect” on page 5.
- Section 2.3, “Racked FXT Series Nodes” on page 6.
- Section 2.4.1, “Service Area Clearance” on page 7.
- Section 2.4.2, “California Perchlorate Warning” on page 7.



In addition, observe the following cautions:

- Section 2.4.3, “Two-Person Lift” on page 7.
- Section 2.4.4, “Battery Replacement” on page 7.

➤ To replace a failed motherboard battery:

1. Remove the node from the cluster, as described in Section 10.1, “Removing Nodes from and Adding Nodes to the Cluster” on page 51.
2. Turn off the node by pressing the power button on the front. The “Power” LED will either be not illuminated or illuminated red.



The FXT Series node is provided with multiple power cords, and has a power-on/standby-type power switch. This switch does not function as an AC mains disconnect. To disconnect all power for maintenance or an electrical emergency, remove *all* power cords.

3. Remove all power cords from the node.
4. Remove the node from the rack, as described in Chapter 10, *Unracking and Opening an FXT Node* on page 51.
5. Remove the node's top cover as described in Section 10.3, “Opening the Node” on page 53.

6. Locate the motherboard battery, shown in the following figure

- On an FXT 2x00 Series node, the battery is located toward the front of the node and to the left of the motherboard's center.
- On an FXT 2x50, FXT 3xx0, or FXT 4xx0 Series node, the battery is located toward the rear of the node and to the right of the motherboard's center.

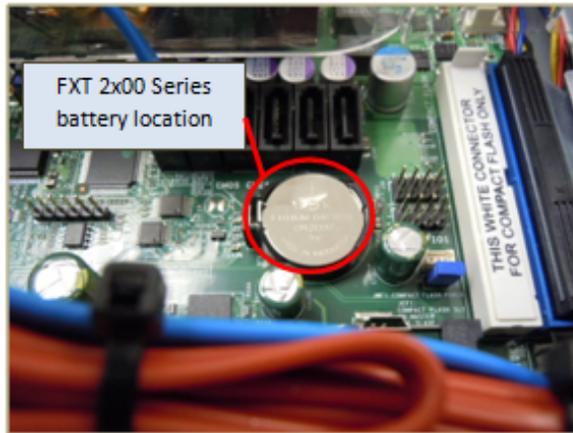


Figure 7.1. Location of the motherboard battery on an FXT 2x00 Series node

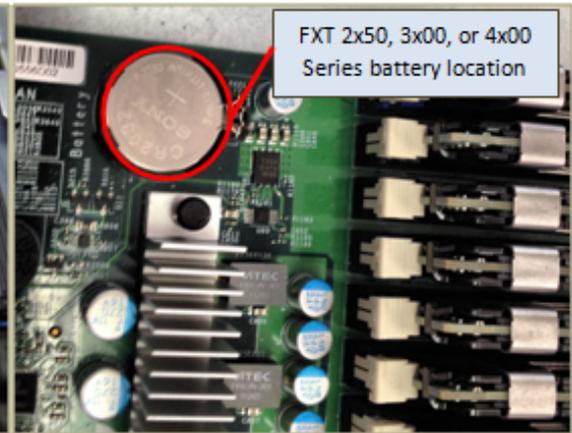


Figure 7.2. Location of the motherboard battery on an FXT 2x50, FXT 3xx0, or FXT 4xx0 Series node

7. Place the tip of a *non-metallic* tool on the battery socket's latch tab, as shown in the first following figure. Apply pressure in the indicated direction until the battery releases from its socket, as shown in the following figure:

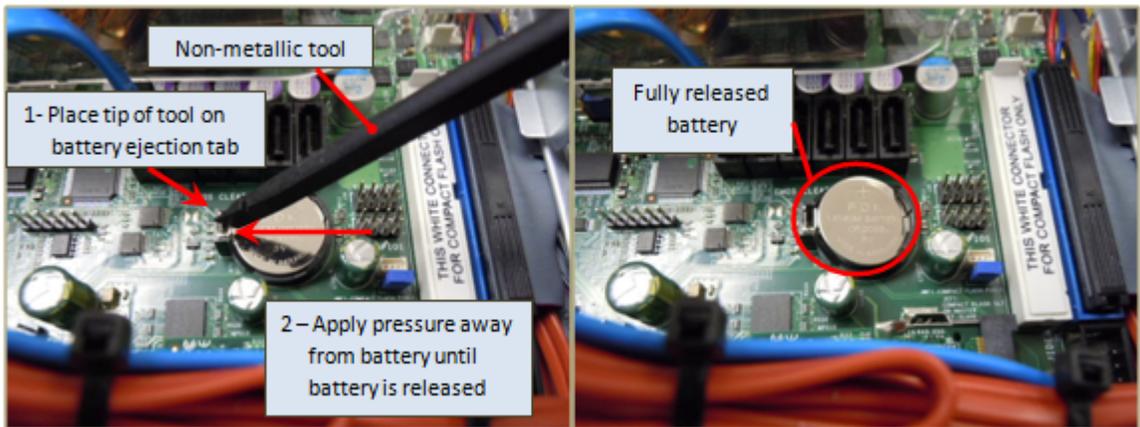


Figure 7.3. Ejecting the battery from its socket

- Remove the failed battery by using two fingers, as shown in the following figure. Dispose of it according to your site's battery-disposal requirements.

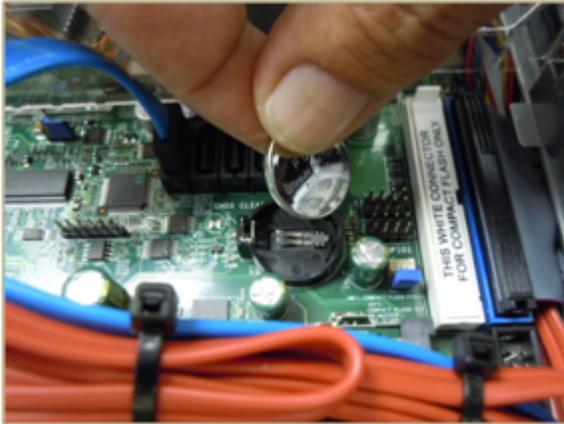


Figure 7.4. Removing the battery

- Verify that the replacement battery's type is CR2032. Note which side of the battery has the plus (+) polarity indicator, as shown in the following figure:

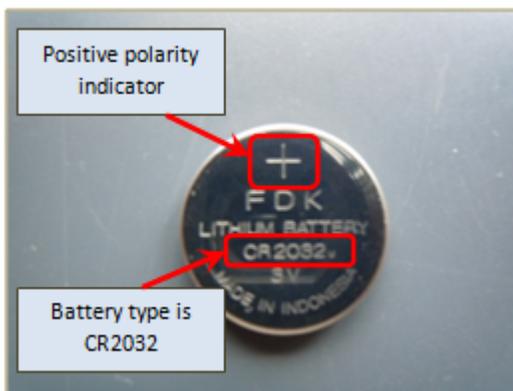


Figure 7.5. Replacement battery, type CR2032, with plus polarity indicator on top

- Orient the battery so the plus (+) polarity indicator is facing up. Use two fingers to angle the battery slightly and insert it into the side of the battery socket opposite the latch mechanism, as shown in the following figure. Remove your fingers to release the battery.



The battery is not yet fully installed at this point.

11. Use a finger to apply downward pressure to the top of the battery near the latch until the battery snaps into the socket, as shown in the following figure.

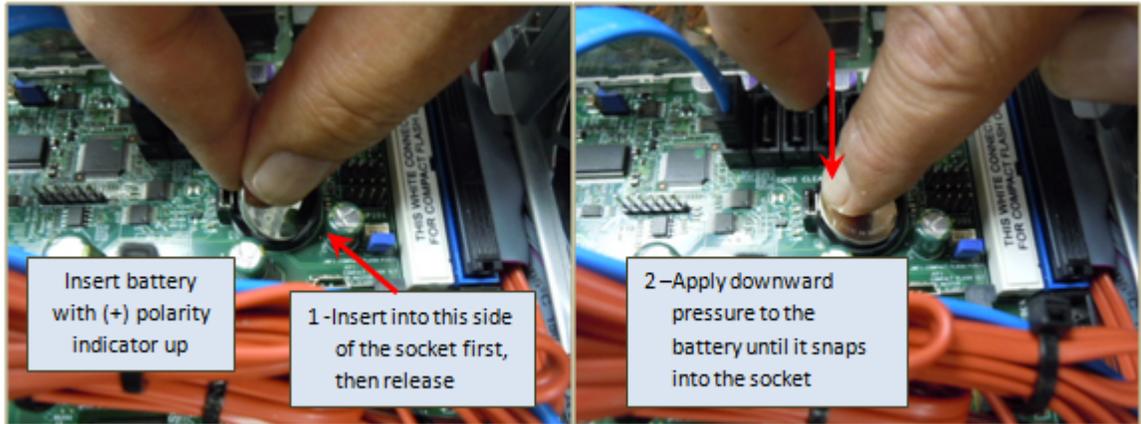


Figure 7.6. Inserting the replacement battery into the socket

12. Verify that the plus (+) polarity indicator is facing up and that the battery socket's latch tabs have captured the top of the battery, as shown in the following figure.

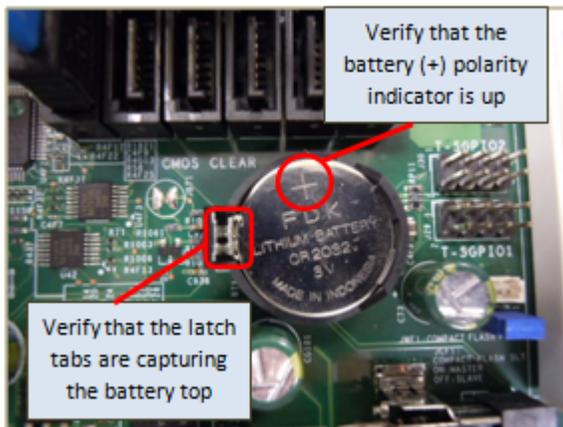


Figure 7.7. Verifying the correct placement of the battery

13. Replace the node's top cover as described in Section 10.4, "Replacing the Cover of the Node" on page 56.
14. Reinstall the node into the rack, as described in Section 10.5, "Reinstalling an Node into a Rack" on page 58.
15. Reattach all power cables, and power on the node by pressing the Power button on the front of the node.
16. Add the node back to the cluster, as described in Section 10.1, "Removing Nodes from and Adding Nodes to the Cluster" on page 51.

Chapter 8. Replacing SFP+ Modules

This section describes how to replace a SFP+ module on an FXT Series node. This procedure applies to Avere FXT 2x50, FXT 3xx0, and FXT 4xx0 models only.

NOTICE

Before replacing an SFP+ module, read Section 2.5, “Laser Radiation” on page 8.

8.1. Replacing an SFP+ Module

- To remove an SFP+ module:
 1. Extend the release handle of the module outward.
 2. Gently pull on the release handle. The module should release and be removable.

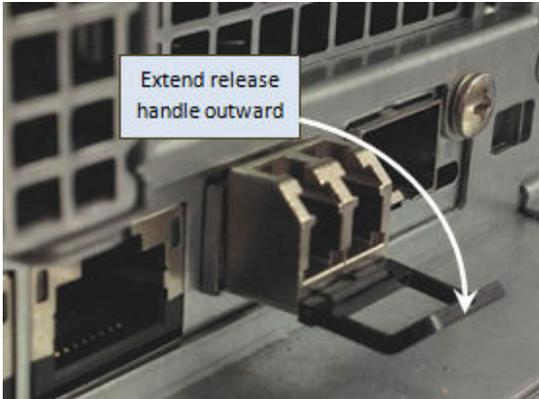


Figure 8.1. Extending the handle

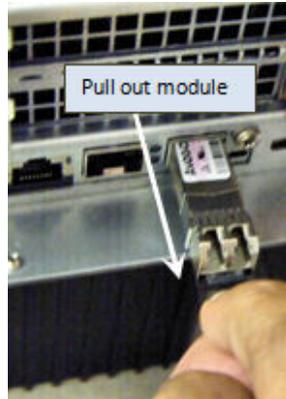


Figure 8.2. Detaching the SFP+ module

- To replace the module:
 1. Orient the replacement module so that the edge card connector is facing down.
 2. With the handle closed, slide the module into the SFP+ port until it is firmly seated.

8.2. Extracting Stuck SFP+ Modules

Occasionally, SFP+ modules can become stuck in the FXT chassis. This can prompt service personnel to use inappropriate hand tools or excessive force to extract the module, potentially causing the handle to break off or otherwise damaging the module and the motherboard. This section explains how to safely extract a stuck module.

8.2.1. Extracting a Stuck Module Using the Handle

- To remove an SFP+ module that still has the handle attached:
 1. Extend the release handle of the module outward. Do *not* pull on the handle at this time.
 2. Using your thumb, firmly push in on the body of the module.
 3. While continuing to push on the body of the module, simultaneously pull on the release handle.

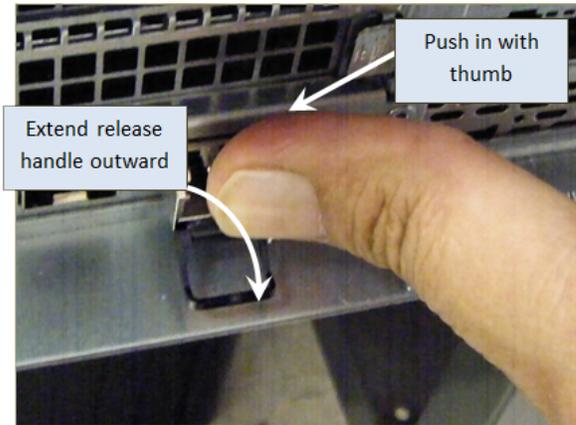


Figure 8.3. Loosening the SFP+ module

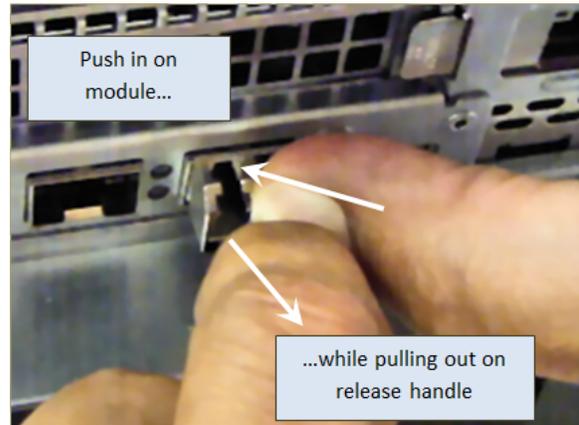


Figure 8.4. Detaching the SFP+ module

4. Release the thumb that is pushing on the module body. The module should release and be removable.



Figure 8.5. Removing the SFP+ module

5. If this method is unsuccessful, continue to Section 8.2.2, “Extracting a Module Using a Tool for Assistance”.

8.2.2. Extracting a Module Using a Tool for Assistance

- To remove an SFP+ module that could not be removed using the handle, or where the handle has broken off:
 1. Locate the locking tab under the module, and find a miniature flat-head screwdriver no wider than 3/16" (4.5mm).

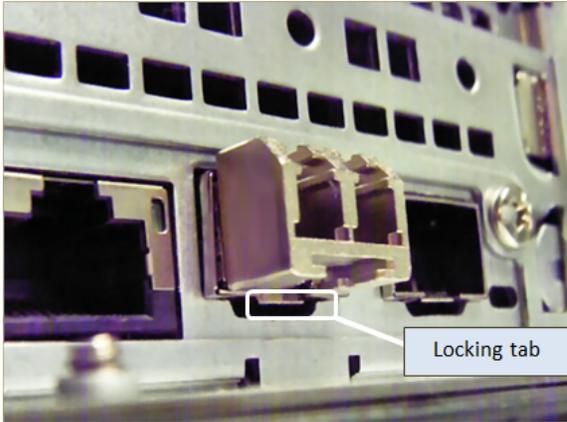


Figure 8.6. Locking tab on the module

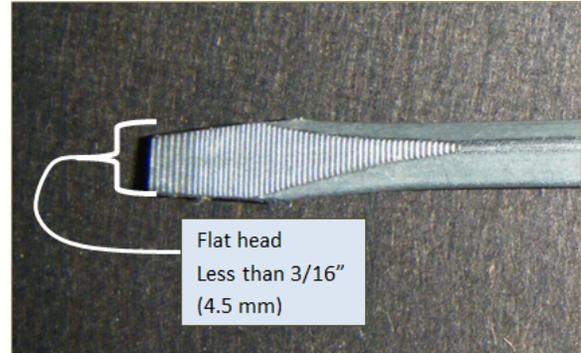


Figure 8.7. Screwdriver dimensions

2. Insert the head of the screwdriver between the module and the locking tab, and gently pull up on the screwdriver to pry the locking tab down. Be careful to not permanently deform the tab.

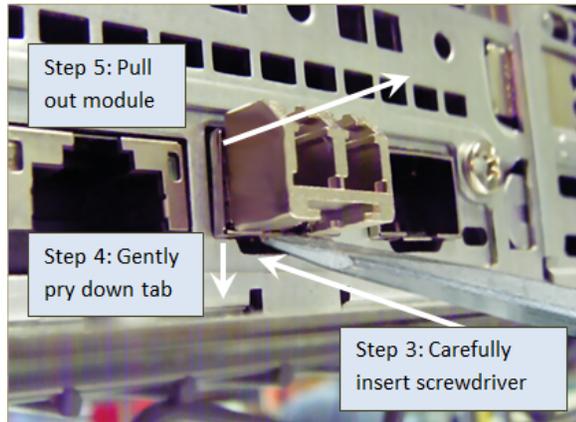


Figure 8.8. Removing the SFP+ module

3. While executing Step 2, pull out on the module body. The module should release and be safely removable. If this method does not work, contact Avere Global Services for further instructions, as described in Appendix A .

Chapter 9. Replacing a Complete Node

An FXT Series node must be replaced if any of the following non-replaceable components fail:

- Motherboard, including any onboard disk, networking, and IPMI ports and controllers
- Power distributor
- SAS midplane
- CPUs and heatsinks
- DRAM modules (DIMMs)
- PCIe drive controller adapters
- PCIe Ethernet networking adapters
- PCIe NVRAM adapters
- Front control panel
- DVD drive (FXT 2x00 Series nodes only)
- IPMI card (FXT 2x50 Series nodes only)



Before opening an node, review the following warnings:

- Section 2.1.1, “Restricted Access” on page 3.
- Section 2.2.1, “Electrical Code Compliance” on page 4.
- Section 2.2.2, “Earth Grounding” on page 4.
- Section 2.2.3, “AC Mains Disconnect” on page 5.
- Section 2.3, “Racked FXT Series Nodes” on page 6.
- Section 2.2.5, “Hazardous Energy Levels” on page 5.
- Section 2.4.1, “Service Area Clearance” on page 7.



Note the following:

- Section 2.5, “Laser Radiation” on page 8.
- Section 2.1.2, “Preventing Condensation” on page 3.

NOTICE

- FXT Series nodes use front-to-back cooling airflow. If the FXT Series node is installed in a rack, the installer is responsible for ensuring that adequate airflow is available through the rack to effectively cool the node.
- Environmental ambient temperature requirements apply to the area immediately around the node. For an node installed into an enclosed rack or a rack with perforated doors, the ambient temperature requirement applies to the area inside the rack or door, immediately around the node.
- Operating the FXT Series node in a rack with open EIA U spaces can cause unintended airflow paths and associated temperature inconsistencies. To maintain proper airflow and temperatures, cover all open rack spaces with blank panels.
- Ensure that the node cover is in place when the node is operating to assure proper airflow and cooling. Thermal damage to the system can occur if this practice is not strictly followed.
- Do not remove disk drives or power supply units unless a replacement component is immediately available. If you remove a replaceable component, replace it immediately after removing the original component to ensure proper airflow and cooling. Damage to the system can occur if this practice is not strictly followed.

➤ To replace a failed node:

1. Remove the node from the cluster, as described in Section 10.1, “Removing Nodes from and Adding Nodes to the Cluster” on page 51.
2. Turn off the node by pressing the power button on the front. The “Power” LED will either be not illuminated or illuminated red.

WARNING

The FXT Series node is provided with multiple power cords, and has a power-on/standby-type power switch. This switch does not function as an AC mains disconnect. To disconnect all power for maintenance or an electrical emergency, remove *all* power cords.

3. Remove all cords from the node.
4. Remove the node from the rack, as described in Chapter 10, *Unracking and Opening an FXT Node* on page 51.
5. Install the replacement node into the rack, as described in Section 10.5, “Reinstalling an Node into a Rack” on page 58.
6. Reattach all network cables to the new node as they were connected to the failed node, and then reattach the power cords to the AC inputs on the new node’s power supply units.
7. Power on the FXT Series node by pressing the power button on the front of the node.
8. Add the node back to the cluster, as described in Section 10.1, “Removing Nodes from and Adding Nodes to the Cluster” on page 51.
9. Return the failed node to Avere Systems. Instructions for returning the failed node are included in the replacement part’s shipping box, or can be emailed from Avere Global Services.

Chapter 10. Unracking and Opening an FXT Node

You should fully remove the node from the rack in the following instances:

- If you are replacing a system drive for a FXT 2x00 Series node, as described in Section 5.3.1, “Replacing a Failed System Drive on an FXT 2x00 Series Node” on page 29.
- If you are replacing a fan, as described in Chapter 6, *Replacing a Fan* on page 35.
- If you are replacing the motherboard battery, as described in Chapter 7, *Replacing the Motherboard Battery* on page 41.
- If you are replacing the complete node, as described in Chapter 9, *Replacing a Complete Node* on page 49.



Before unracking or opening an node, review the following warnings:

- Section 2.2.3, “AC Mains Disconnect” on page 5.
- Section 2.3, “Racked FXT Series Nodes” on page 6.
- Section 2.4.1, “Service Area Clearance” on page 7.



In addition, observe the following caution:

- Section 2.4.3, “Two-Person Lift” on page 7.

10.1. Removing Nodes from and Adding Nodes to the Cluster

For certain maintenance operations, you will need to use the Avere Control Panel to remove the node with a failed part from the cluster, and to add it back when you have replaced the part.

➤ To remove a node or add it back to the cluster:

1. Navigate to the **FXT Nodes** page under the **Cluster** heading on the **Settings** tab.
2. Locate the nodes in your cluster in the **FXT Nodes** table.



Failed nodes will have the **Reformat** button available; this button will not appear in active healthy node listings.

The screenshot shows the Avere dashboard with a navigation menu on the left and a main content area. At the top, there are status indicators for 'System Error' and 'ALERT', along with a 'Logout' button and the 'AVERE' logo. The navigation menu includes 'Dashboard', 'Settings', 'Analytics', 'Data Management', and 'Support'. The 'Settings' menu is expanded to show 'VServer', 'MASS', 'Cluster', 'General Setup', 'Administrative Network', 'Cluster Network', 'FXT Nodes' (highlighted), 'High Availability', 'Monitoring', 'Schedules', 'Directory Services', 'Kerberos', 'Login Services', 'Active Directory', 'Optimization', 'IPMI', 'Support', 'Licenses', and 'Administration'.

The main content area displays 'FXT Nodes' and 'Unconfigured FXT Nodes' tables.

| Name | Model | Status | Actions | |
|--------|---------|--------|-----------------|------------------|
| camant | FXT2300 | up | Modify settings | Restart services |
| | | | Power down | Remove |
| | | | Suspend | Offline |

| Unconfigured FXT Nodes | | | | |
|------------------------|------------|------------------|---------------|---|
| Name | Address | Software Version | Status | Actions |
| armad | 10.1.2.242 | V3.0.0.1-1d89c4e | Wants to join | Allow to join Upgrade software version |
| vaunt | 10.1.1.28 | V3.0.0.2-9ab4ad5 | Wants to join | Allow to join Upgrade software version |

Figure 10.1. Nodes (with healthy and failed drives) listed on the Dashboard

- To remove the node from the cluster, click the **Remove** button.



Before removing a node from the cluster, ensure that the **Allow unconfigured FXT nodes to join this cluster** checkbox is disabled. Otherwise, the node can immediately rejoin the cluster from which it was just removed.

Adding the Node Back to the Cluster

After you have replaced the part and powered on the node, it will appear in the **Unconfigured FXT Nodes** table.

- To return the node to the cluster, locate the node on the list, and click the **Allow to join** button.

10.2. Removing the Node from the Rack

- To remove the node from the rack:
 - Remove the affected node from the cluster, as described in Section 10.1, “Removing Nodes from and Adding Nodes to the Cluster” on page 51.
 - Turn off the node by pressing the power button on the front. The “Power” LED will either be not illuminated or illuminated red.
 - Before removing any power cords or cables, first label or make note of all connections into the node so they can be replaced correctly.
 - Remove all power cords from the node.

5. Remove all networking and other data cables from the node.
6. Perform one of the following steps, depending on your model of FXT Series node:
 - To remove an FXT 2x00 node from the rack, locate the two round-head screws in the left and right front flanges of the node. Loosen and completely remove the screws from the flanges and retain for later reinstallation.
 - To remove an FXT 2x50, FXT 3xx0, or FXT 4xx0 Series node from the rack, locate the two captive screws on the left and right front flanges of the node. Loosen the two captive screws until they are completely disengaged from the threaded rack holes.
7. Pull on the left and right handles of the node and begin to slide the node out from the rack.
8. Continue to pull the node out until it stops at the safety latches in the slide rails. Do not continue to pull or otherwise force the node beyond the safety latches.
9. While continuing to support the node, locate the two safety latches on the left and right rails and press them down to release the rails.
10. While holding the latches down, pull the node out until the left and right rails disengage, and the node is completely out of the rack.
11. Place the node on a workbench or other suitable surface for further maintenance.

10.3. Opening the Node

After you have placed the node in a stable workspace, remove the top cover of the node, as described in the following sections. FXT 2x00 Series nodes require a slightly different method from FXT 2x50, FXT 3xx0, and FXT 4xx0 Series nodes.

10.3.1. FXT 2x00 Edge Series Node

➤ To open an FXT 2x00 Series node:

1. Remove the flathead securing screws on the right-side flange of the top cover, retaining the screw for later reinstallation. The location of the right-hand screw is shown in the following illustration.

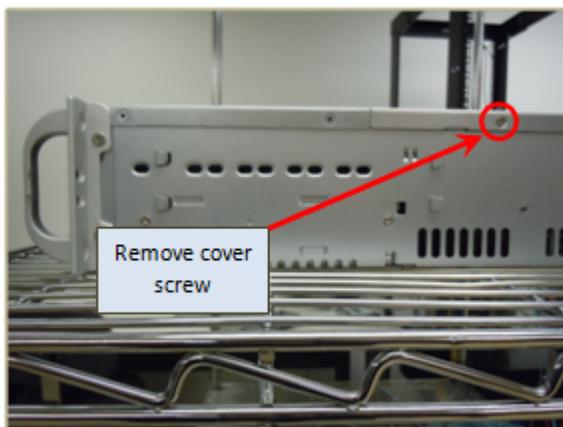


Figure 10.2. Top cover screw on an FXT 2x00 Series node

2. Press down and hold the two buttons located towards the front of the top cover. Slide the cover rearward and lift the cover away as shown in the following illustration.

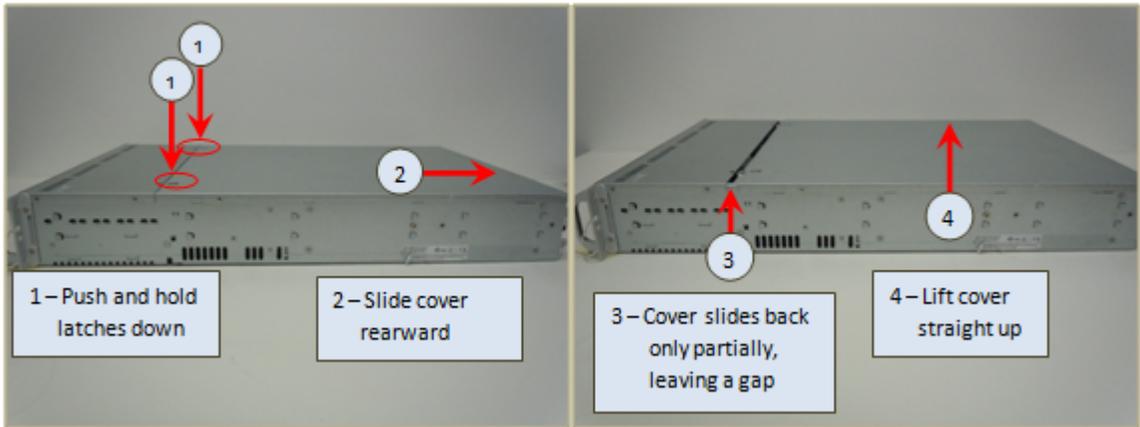


Figure 10.3. Removing the cover of an FXT 2x00 node

10.3.2. FXT 2x50, FXT 3xx0, or FXT 4xx0 Series Node

➤ To open an FXT 2x50, FXT 3xx0, or FXT 4xx0 Series node:

1. Remove the two flathead securing screws on the left- and right-side flange of the top cover, retaining the screws for later reinstallation. The screws are shown in the following illustration:

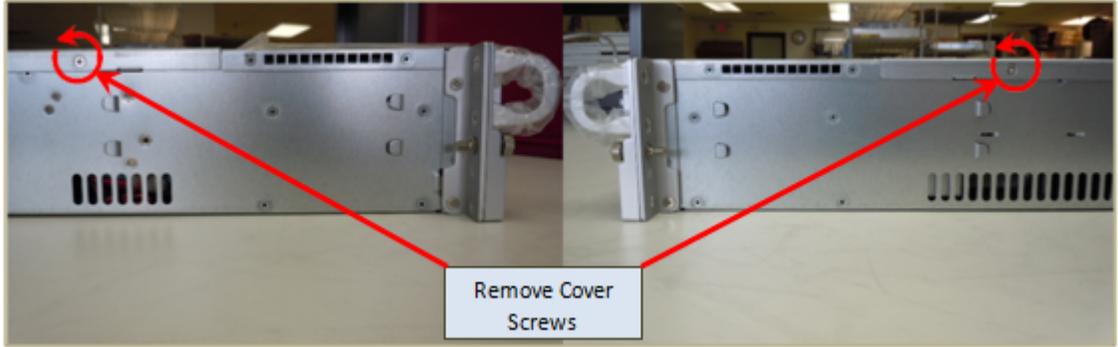


Figure 10.4. Screws securing the top cover of an FXT 2x50, FXT 3xx0, or FXT 4xx0 Series node

2. As shown in the following illustration, press the two rubber grips and slide the cover rearward until it stops, then lift the cover straight up to remove it from the node:

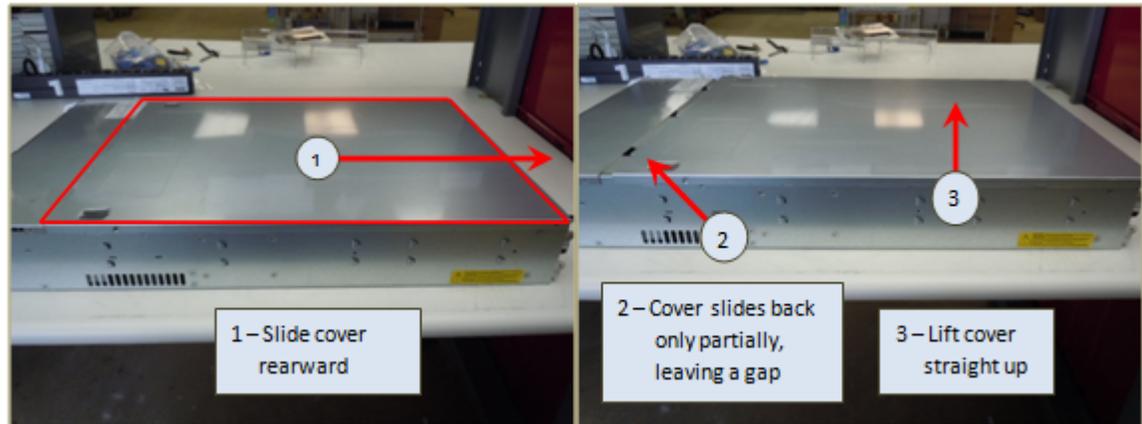


Figure 10.5. Removing the cover of an FXT 2x50, FXT 3xx0, or FXT 4xx0 Series node

10.4. Replacing the Cover of the Node

After you have performed all required maintenance on the affected node, you can replace the cover. Again, FXT 2x00 Series nodes require a slightly different method from FXT 2x50, FXT 3xx0, and FXT 4xx0 Series nodes.

10.4.1. FXT 2x00 Series Node Cover Replacement

➤ To replace the cover on an FXT 2x00 Series node:

1. As shown in the following illustration, align the top cover edge with a gap relative to the rear-most edge of the node's top front cover and lower the cover straight down. Slide the cover forward until both latches snap up and secure the cover in the closed position.

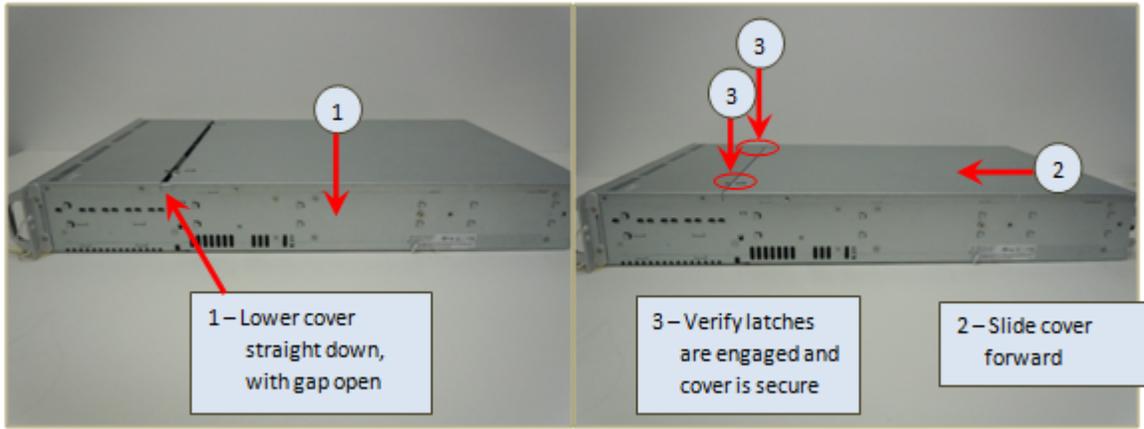


Figure 10.6. Replacing the top cover of an FXT 2x00 node

2. Locate the flathead screw you previously removed from the cover. Install the screw in the right-hand flange of the cover and tighten, as shown in the following illustration.

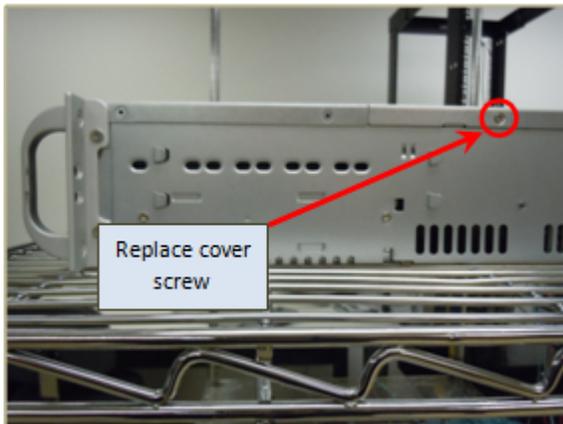


Figure 10.7. Attaching the top cover screw to an FXT 2x00 Series node

10.4.2. FXT 2x50, FXT 3xx0, or FXT 4xx0 Series Node Cover Replacement

➤ To replace the cover on an FXT 2x50, FXT 3xx0, or FXT 4xx0 Series node:

1. As shown in the following illustration, align the top cover over the node so it leaves a gap between the front cover edge and the rear-most edge of the node's top front cover. Then slide the cover forward.

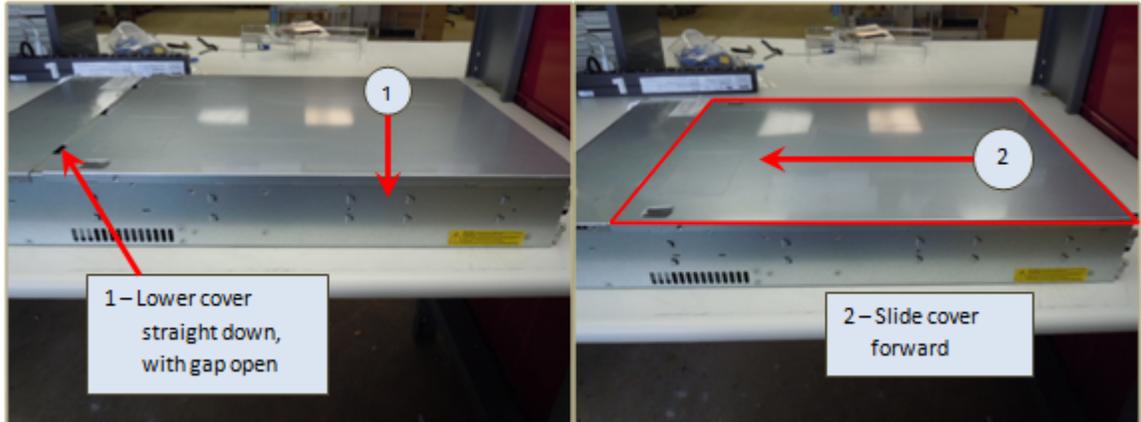


Figure 10.8. Replacing the top cover of an FXT 2x50, FXT 3xx0, or FXT 4xx0 Series node

2. Locate the flathead screws you previously removed from the cover. Install them in the cover and tighten, as shown in the following illustration.



Figure 10.9. Attaching the top cover screws to an FXT 2x50, FXT 3xx0, or FXT 4xx0 Series node

10.5. Reinstalling an Node into a Rack



Before re-racking an node, review the following warnings:

- Section 2.1.1, “Restricted Access” on page 3.
- Section 2.2.1, “Electrical Code Compliance” on page 4.
- Section 2.2.2, “Earth Grounding” on page 4.
- Section 2.2.3, “AC Mains Disconnect” on page 5.
- Section 2.3, “Racked FXT Series Nodes” on page 6.
- Section 2.2.5, “Hazardous Energy Levels” on page 5.
- Section 2.4.1, “Service Area Clearance” on page 7.



In addition, observe the following caution:

- Section 2.4.3, “Two-Person Lift” on page 7.



Note the following:

- Section 2.5, “Laser Radiation” on page 8.
- Section 2.6, “Thermal Considerations” on page 8.

➤ To reinstall an node into a rack:

1. Pull the extensible mechanism and ball-bearing shuttle of the outer rack rails fully outward until they can move no further, so that they protrude from the front of the rack.
2. Verify that the extended mechanisms and ball-bearing shuttles are locked into place in the outward position so they do not move when you install the node.
3. Align the inner rails on the node with the outer rails on the rack.
4. Begin sliding the inner rails into the outer rails, maintaining equal pressure on both sides.
5. Verify that the node’s inner rails are completely and properly engaged with the outer rack rails and that the node slides smoothly.
6. Continue to slide the node into the rack until the safety latches on the inner rails engage with the outer rails. Each latch emits a click when it engages.
7. Verify that the safety latches operate properly by pulling the node forward and making sure it stops in its fully extended position. The inner rails must not disengage from the outer rails.
8. Verify that the rack and rail installation can safely sustain the node’s weight with the node in the extended position.
9. Slide the node into its final position in the rack.
10. Perform one of the following steps depending on your model of FXT Series node. These steps use the screws you removed from the rack and node in Section 10.2, “Removing the Node from the Rack” on page 52.

- To secure an FXT 2x00 node to the rack, locate the two long round-head screws. Insert the screws through the left and right flanges of the node and into the threaded holes in the left and right rail assemblies, then fully tighten.
 - To secure an FXT 2x50, FXT 3xx0, or FXT 4xx0 Series node to the rack, locate the two pre-attached captive screws on the left and right flanges of the node. Thread the captive screws into the threaded holes in the left and right rail assemblies, then fully tighten.
11. Before reconnecting the power cords, and the networking and data cables, refer to the notes taken earlier regarding their locations.
 12. Reconnect all networking and other data cables to the node.
 13. Reattach all power cables, and power on the node by pressing the Power button on the front of the node.

Appendix A. Contacting Avere Global Services

- To access Avere Global Services contact information when you are using the Avere OS, click the Avere Control Panel's **Support** tab. This page lists the following Web, phone, and email contact information and links:
 - Web: <http://www.averesystems.com/support>
 - Phone:
1-888-88-AVERE (1-888-882-8373, Press 2 (Toll-Free in the US and Canada)
1-412-635-7170, Press 2
 - Email: <support@averesystems.com>

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