Apple Technician Guide

Xserve (Early 2009)

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Xserve (Early 2009)

Contents

Basics

Troubleshooting

Take Apart

Views

Apple Technician Guide

Basics

Xserve (Early 2009)

Overview

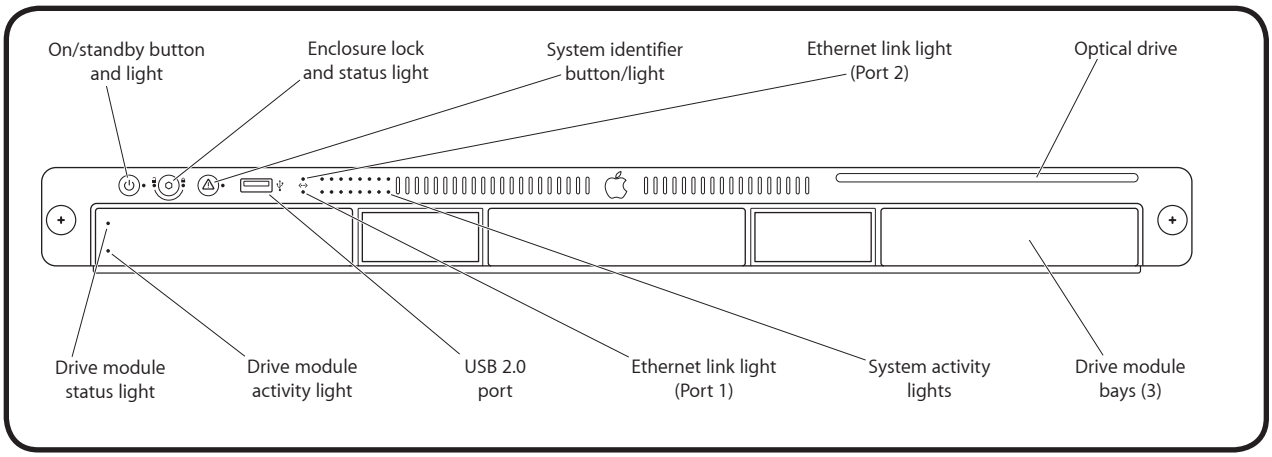
The Xserve (Early 2009) rack-optimized server features single or dual Quad-Core Intel Xeon "Nehalem" processors, integrated memory controllers featuring up to 12 DIMMs of 1066MHz DDR3 ECC RAM, three hot-plug drive bays supporting SATA or SAS Apple Drive Modules, support for a Solid-State Drive (SSD) boot drive, dual x16 PCI Express 2.0 slots, NVIDIA GeForce GT 120 graphics subsystem and integrated lights-out management.

Identifying Features

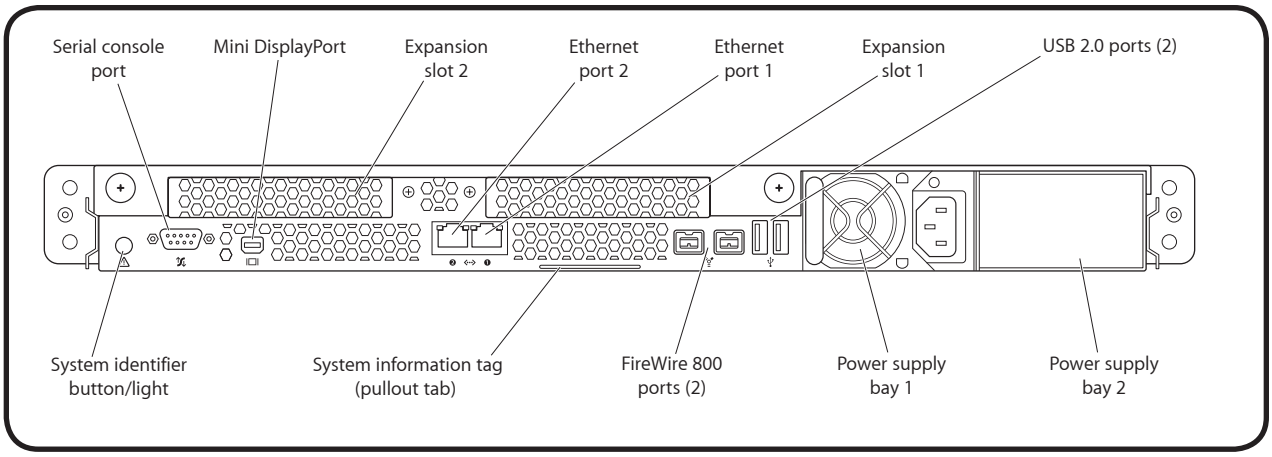
The main features and service differences include:

- single and dual Intel Xeon "Nehalem" processors
- 6 or 12 DIMM slots depending on processor configuration
- Solid-State Drive Support
- Mini DisplayPort connector on rear panel

Front View



Rear View



Serial Number Location

The serial number is located at the rear of the unit: on the ID Tab.

Hot-Pluggable SATA or SAS Drives

The server includes three hard drive bays at the front of the Xserve. All bays support Apple qualified hot-pluggable Apple Serial ATA (SATA) or Serial Attached SCSI (SAS) drive modules. Xserve drive bays support qualified Apple Drive Modules with Apple qualified hard drives and firmware only. Drive bays not configured with an Apple Drive Module ship with a non-functional blank drive carrier which do not support third-party hard drive installation.

Drive bays are numbered 1-3, beginning with the far left bay. The drive installed in bay 1 is the boot drive and should have the operating system installed on it. Xserve's configured with a Solid-State Drive (SSD) will contain the Mac OS X Server operating system and function as the boot drive.

You can replace or install hard drives while the Xserve is running; you do not need to shutdown or open the Xserve first, but you may need to dismount the drive from the Xserve OS beforehand. A status light on the front of each drive indicates when it is safe to remove the drive without losing data. For more information, see "Apple Drive Module" in the Take Apart chapter.

Solid-State Drive

The server may include an optional Solid-State Drive. The drive contains the Mac OS X Server operating system as the boot drive for the Xserve.

Power Supply Redundancy

The Xserve (Early 2009) supports up to two power supply modules for redundancy. There are two power supply bays in the rear of the enclosure. You can replace or install a power supply from the back panel without removing the Xserve from the rack. If the Xserve has two power supplies, they are hot-swappable; the Xserve will continue to operate using only one supply while the second is removed. For more information about removing or installing power supply modules, see "Power Supply" in the Take Apart chapter.

How to Identify Single- and Dual-Processor Configurations

To identify the configuration of an Xserve (Early 2009) computer, check the code on the computer's ID Tab, which is located on the computer's back panel. See "**Serial Number Location**."

There are three options for identifying single and dual processor configurations:

- Quad-Core Xserve (Early 2009): Single processor logic board with 6DIMM slots, and one large heat sink
- 8-Core Xserve (Early 2009): Dual processor logic board with 12 DIMM slots, and two large heat sinks:
- Quad-Core Xserve (Early 2009): Single processor logic board, 12 DIMM slots and one large heat sink. This option is present only when a single-processor logic board has previously been replaced via the Xserve service parts kit.

Apple Technician Guide

Troubleshooting

Xserve (Early 2009)

General Troubleshooting

Update System Software

Important: Whenever possible before beginning troubleshooting, ensure the latest software and firmware updates have been applied.

Troubleshooting Theory

For general information on troubleshooting theory, refer to:

http://service.info.apple.com/service_training/en/006/troubleshoot/index.php?page=intro

Emerging Issues

For the latest on troubleshooting issues, refer to:

http://support.apple.com/kb/index?page=search&q=khot%20Xserve%20Emerging%20Issue

Hardware vs. Software

For information on how to isolate a hardware issue from a software issue, refer to:

http://support.apple.com/kb/TS1388

TS1394—Mac OS X: Troubleshooting installation and software updates <http://support.apple.com/kb/TS1394>

HT2956—Troubleshooting Mac OS X installation from CD or DVD <http://support.apple.com/kb/HT2956>

For information on how to troubleshoot a software issue, refer to:

HT1199—Mac OS X: How to troubleshoot a software issue <http://support.apple.com/kb/HT1199>

HT1219—Xserve, Xserve RAID: Apple Drive Module (ADM) compatibility <http://support.apple.com/kb/HT1219>

Xserve Firmware Updates

Firmware is the name given to software that is written into memory circuits, such as flash memory, that will hold the software code indefinitely, even when power is removed from the hardware. Firmware on Intel Mac computers is designed to be updated if necessary through a software update.

EFI and SMC firmware is stored on the Xserve (Early 2009) backplane board. EFI firmware updates update the Boot ROM, and SMC updates update the System Management Controller firmware. The SMC manages fans and other environmental parameters that are independent of the Boot ROM.

Firmware symptoms can be easily mistaken for hardware issues (e.g., overheating issues, fan noise issues, etc.). Always check both EFI and SMC firmware versions and update if necessary before replacing any hardware components.

The following lists describe the type of symptoms that may be resolved by updating the EFI and SMC firmware.

Symptoms that may be resolved by updating EFI firmware:

- Cannot eject media (various conditions)
- No video on start up
- Not waking or sleeping when expected
- Bad media taking too long to eject (including holding mouse button down at startup taking minutes to eject)

Symptoms that may be resolved by updating SMC firmware:

- Fan related behavior (excessive speed or noise)
- Loud audible clicking from some fans
- Thermal shut down or warnings
- Diagnostics reporting failures
- Sleep/wake issues
- Intermittent shut down
- SMC causes bad/missing ambient sensor to cause the computer to go to sleep
- Hangs, black screen on restart from Windows

Please follow the steps outlined in KnowledgeBase article HT2013, "**About Firmware Updates for Xserve**," to perform an EFI and/or SMC firmware update. Information about firmware versions for Intel Macs can be found in KnowledgeBase article HT1237, "**Mac OS X: Firmware Updates for Intel-based Macs**."

Memory Configuration

Xserve (Early 2009) comes with a minimum of 3 GB of 1066MHz DDR3 ECC memory, installed as three 1 GB unbuffered dual inline memory modules (UDIMMs).

DIMMs must fit these specifications:

- PC3-8500,1066 MHz, DDR3 SDRAM UDIMMs
- 72-bit wide, 240-pin modules
- 36 memory ICs maximum per UDIMM
- Error-correcting code (ECC)

For proper operation of Xserve (Early 2009) computers, Apple recommends using only Apple-approved DIMMs. Refer to GSX for Apple DIMM service part numbers. Memory from older Xserve computers is not compatible with Xserve (Early 2009).

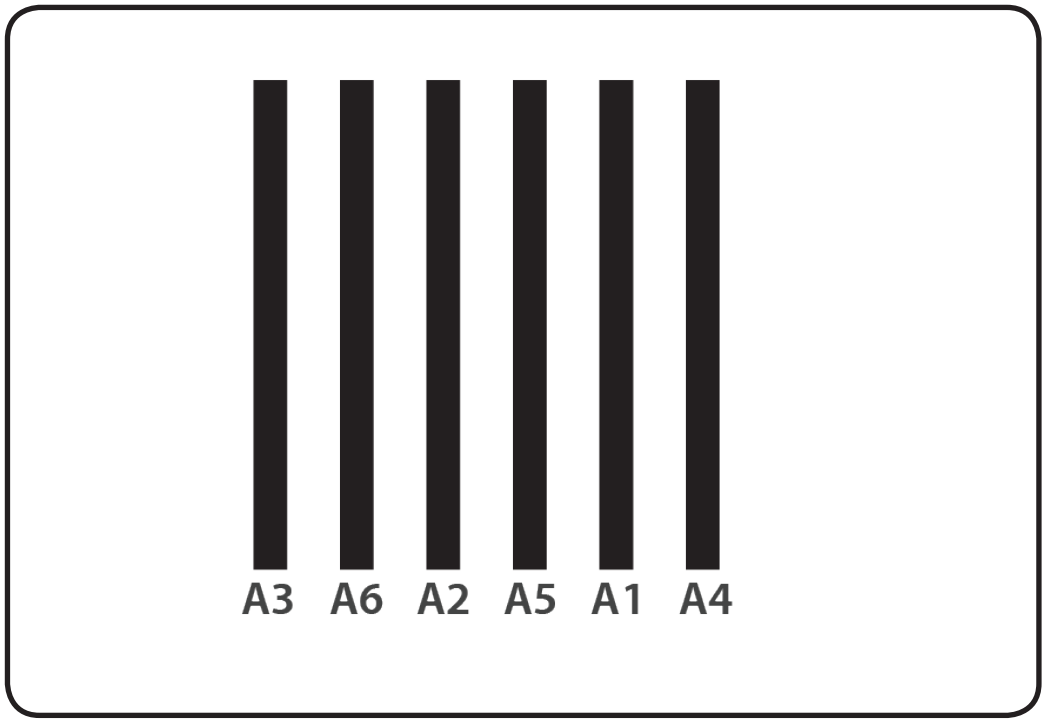
Single Processor

Single-processor (quad-core) computers have six memory slots. You can install 1 GB, 2 GB or 4GB DIMMs for a total of up to 24 GB of memory.

You can install different size DIMMs in Xserve (Early 2009). However, for best performance, Apple recommends you install equal-size DIMMs (all 1, 2 or 4GB) filling the slots in the order listed in this table.

If you have	Fill these slots
Three DIMMs	A1, A2, and A3
Four DIMMs	A1, A2, A3, and A4
Five DIMMs	A1, A2, A3, A4, and A5
Six DIMMs	A1, A2, A3, A4, A5, and A6

See also "**Memory Slot Utility**" below.



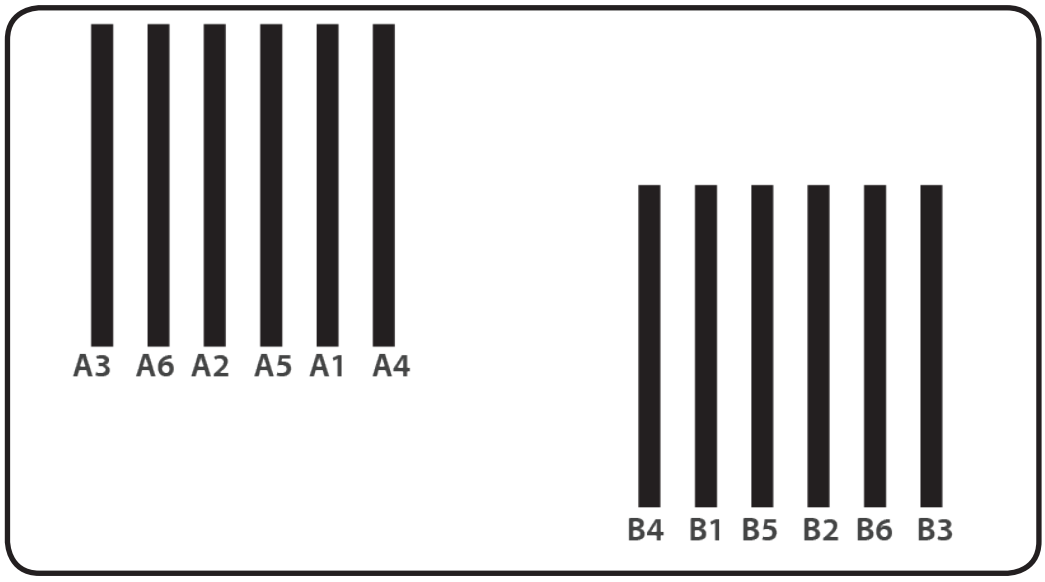
Dual Processor

Dual-processor (eight-core) computers have twelve memory slots. You can install 1 GB, 2 GB, or 4 GB DIMMs for a total of up to 48 GB of memory.

You can install different size DIMMs. in Xserve (Early 2009) However, for best performance, Apple recommends you install equal-size DIMMs (all 1, 2, or 4 GB) filling the slots in the order listed in this table.

If you have	Fill in these slots
Three DIMMs	A1, A2, and A3
Four DIMMs	A1, A2, and B1, B2
Five DIMMs	A1, A2, A3 and B1, B2
Six DIMMs	A1, A2, A3 and B1, B2, B3
Seven DIMMs	A1, A2, A3, A4 and B1, B2, B3
Eight DIMMs	A1, A2, A3, A4 and B1, B2, B3, B4
Nine DIMMs	A1, A2, A3, A4, A5 and B1, B2, B3, B4
Ten DIMMs	A1, A2, A3, A4, A5, A6 and B1, B2, B3, B4
Eleven DIMMs	A1, A2, A3, A4, A5, A6 and B1, B2, B3, B4, B5
Twelve DIMMs	A1, A2, A3, A4, A5, A6 and B1, B2, B3, B4, B5, B6

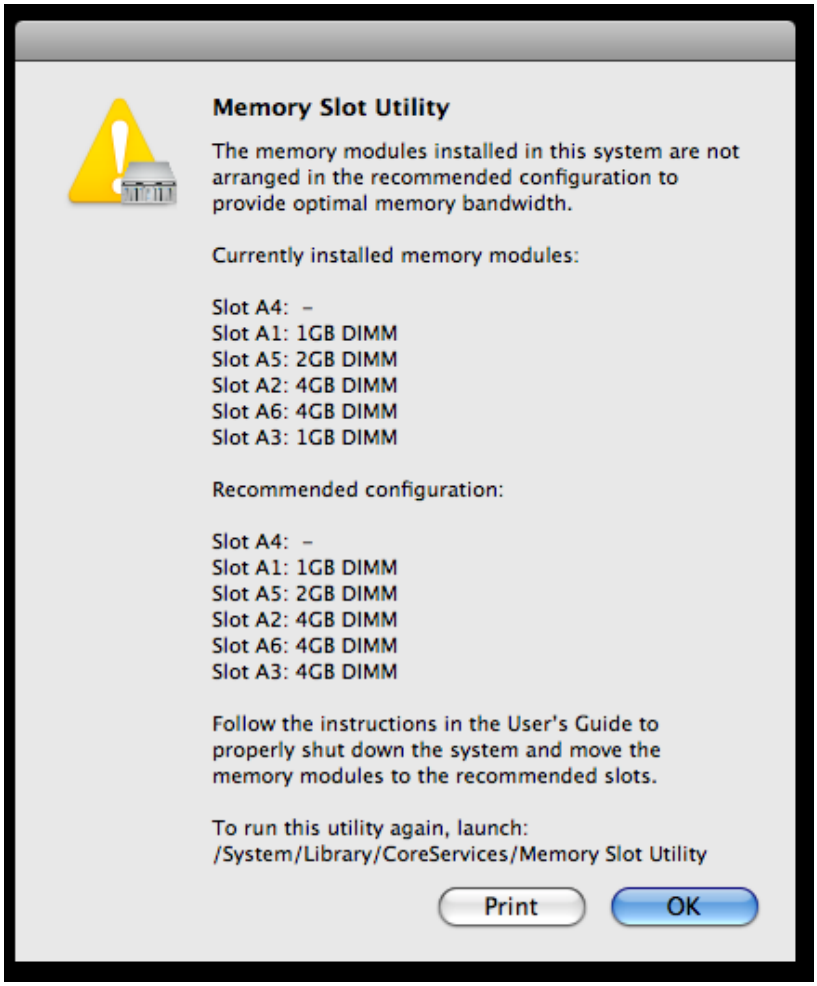
See also "Memory Slot Utility" below.



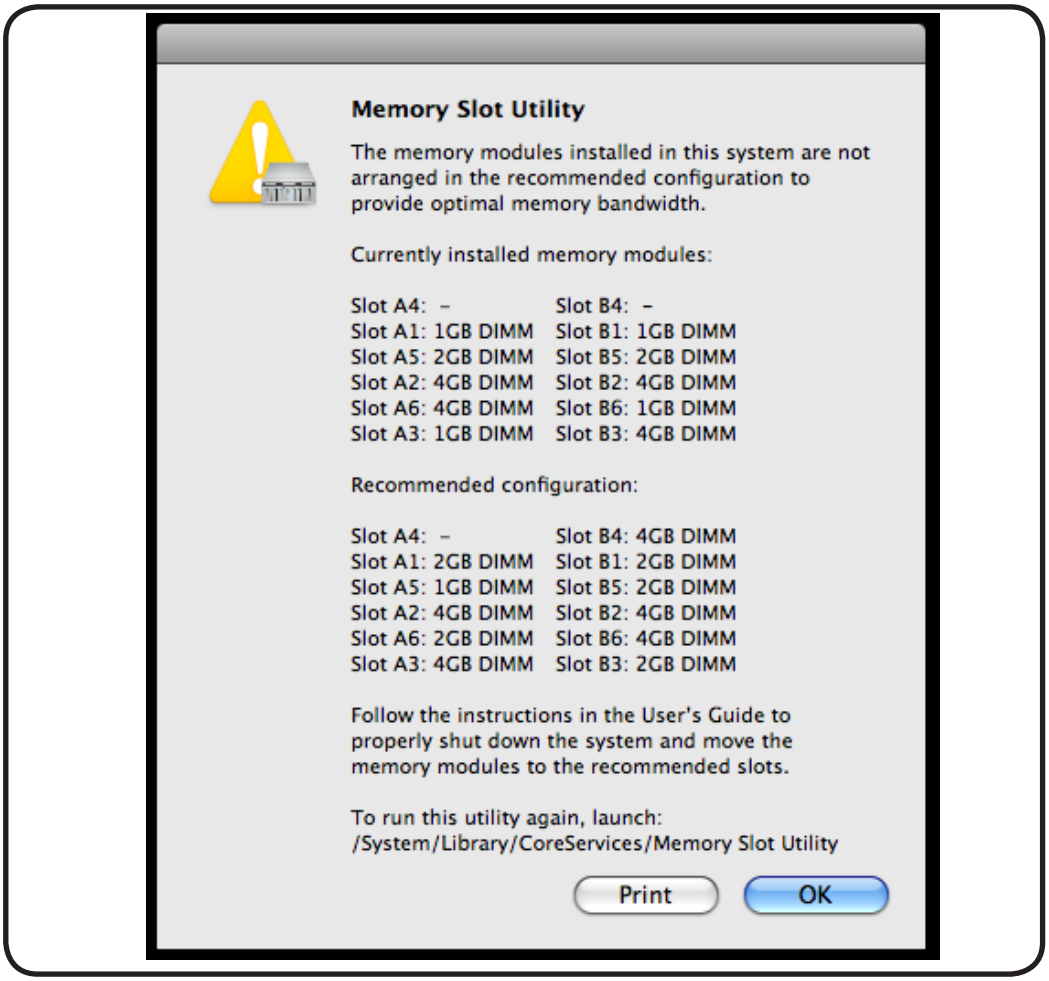
Memory Slot Utility

If you install different size DIMMs in single-processor or dual-processor computers, follow the order in the tables above. If the DIMM configuration you install doesn't provide optimized performance, the Memory Slot Utility will appear on screen and recommend an improved configuration. To use the Memory Slot Utility again, go to /System/Library/Core Services.

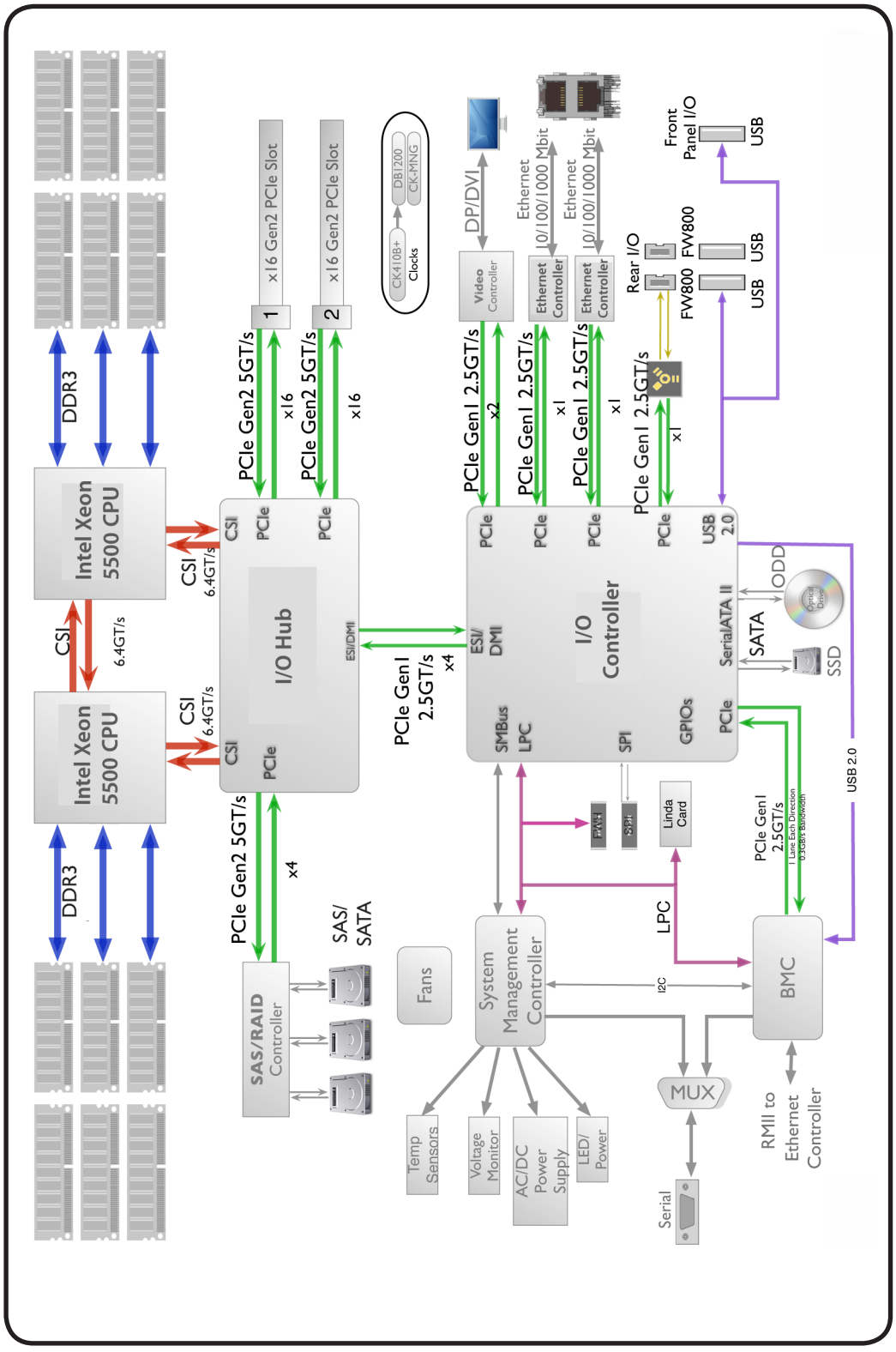
Example of Memory Slot Utility Screen for Single-Processor Computer



Example of Memory Slot Utility Screen for Dual-Processor Computer



Block Diagram



Diagnostic LEDs

Logic Board Diagnostic LEDs

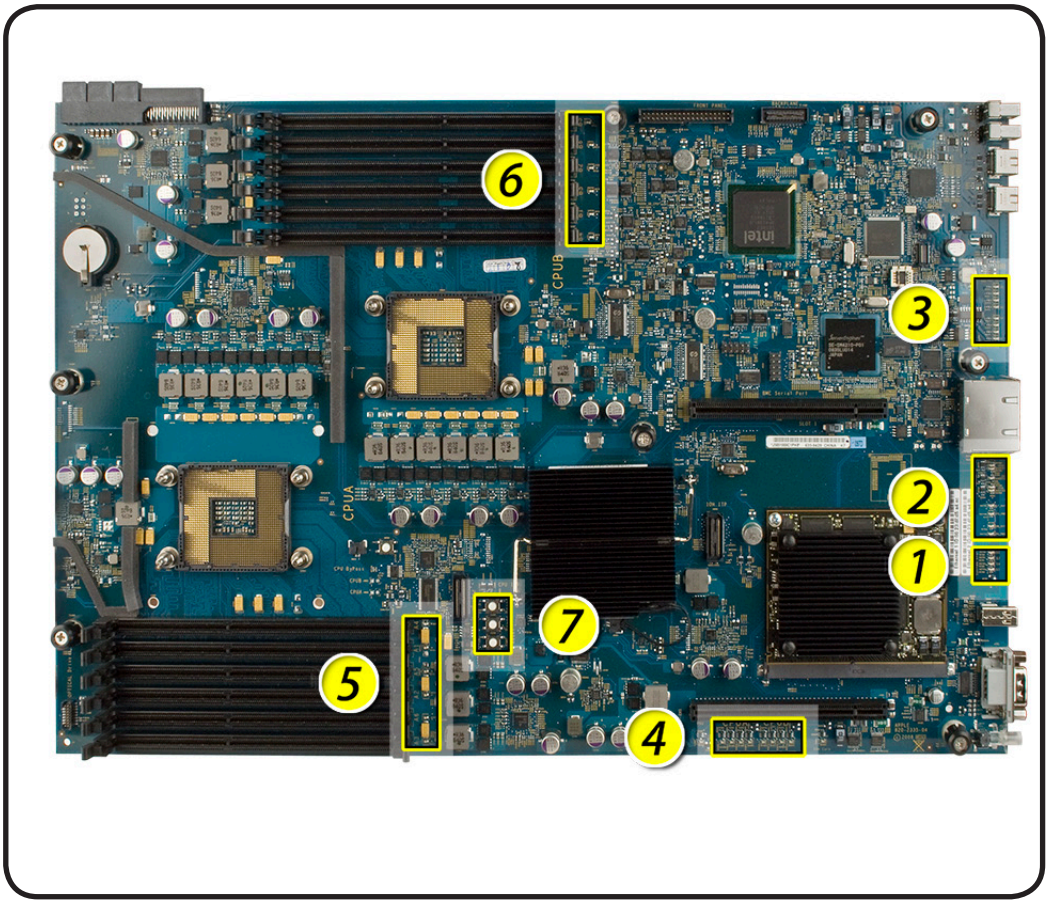
The Xserve (Early 2009) logic board includes a set of LEDs to help service providers troubleshoot the computer. The LEDs are located on the logic board below the DIMM connectors, at the rear of the unit, to the left side of the unit (looking from the back), and on the Drive Interconnect Backplane or Xserve RAID Card.

Some tips:

• You must remove the unit from its rack and place it on a sold surface with its cover removed in order to view these LEDs. Most internal diagnostic LEDs are only enabled to come on when the cover is removed (memory DIMM LEDs remain ON even with the cover in place).

• Do not attempt to troubleshoot the unit solely by these LEDs alone. Use this information to guide your troubleshooting, not lead it.

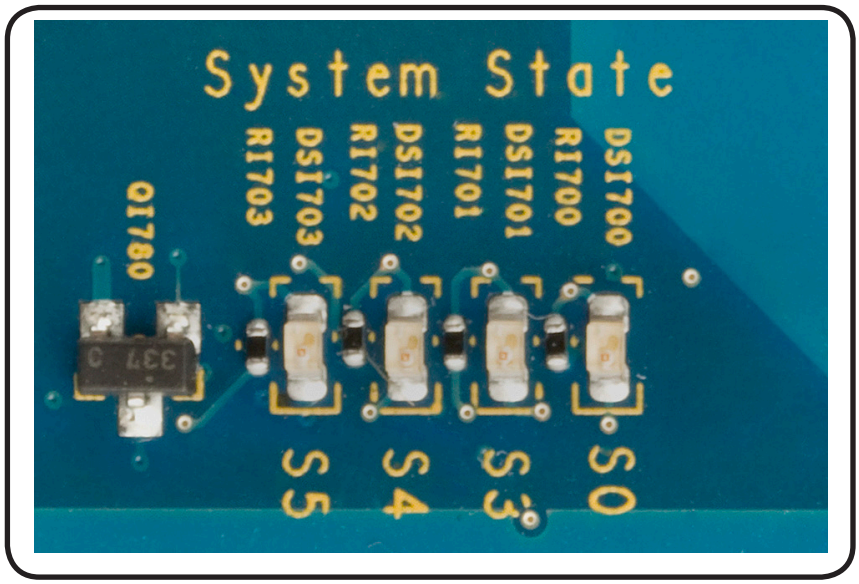
If a specific error condition exists, there should be corresponding LED evidence to help verify and isolate the issue. However, it is not possible to deduce a fault or isolate a specific symptom solely by examining these LEDs out of context.



1. System State LEDs

Use the following table to interpret the LEDs.

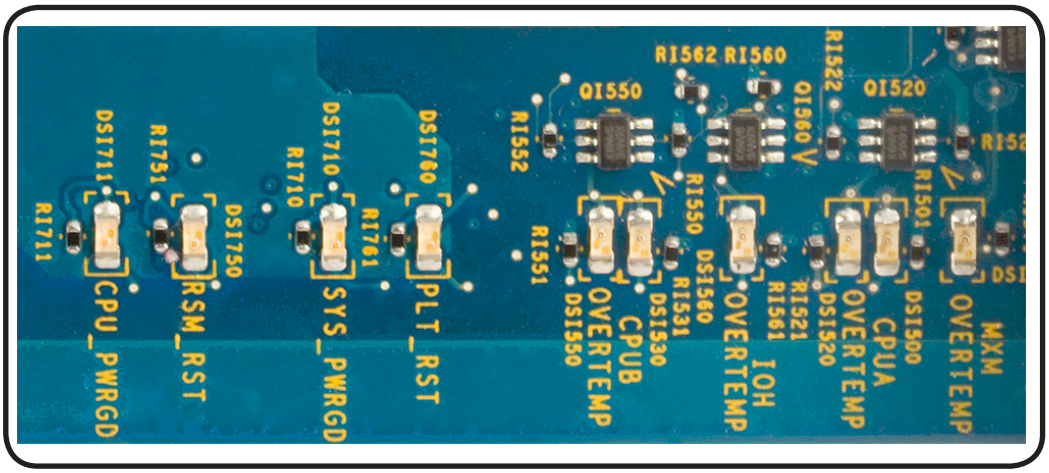
Location	Name	Color	Nominal	Indicates
S0	Power ON	Green	On; off when in standby mode	System is running
S3	Sleep	Green	Off, on when Xserve is in sleep mode	System is in sleep mode
S5	Standby	Green	Off; on when Xserve is in standby	Standby mode, illuminates when AC power is attached



2. CPU Error LEDs

Use the following table to interpret the LEDs.

Location	Color	Nominal	Indicates
CPU_PWRGD	Green	Off; on to indicate hardware power has passed	Power chain in hardware
RSM_RST	Yellow, Red	Off	Fault preventing CPU from executing instructions
SYS_PWRGD	Green	On at power-on to indicate power has passed	Power chain in hardware
PLT_RST	Red	Off; on Yellow at power on	Platform reset
CPU B OVERTEMP	Red	Off; on if CPU B core exceeds normal temperature	Temperature of CPU B core status
IOH OVERTEMP	Red	Off; on if IOH exceeds normal temperature	Temperature of IOH status
CPU A OVERTEMP	Red	Off; on if CPU A core exceeds normal temperature	Temperature of CPU A core status
MXM OVERTEMP	Red	Off; on if MXM video card exceeds normal temperature	Temperature of MXM video card status



Platform Reset

Normally remains on during standby. This LED flashes on (yellow) briefly at power-on. LED should turn off as system powers up and begins to execute instructions.

Overtemp LEDs

Normally off. These LEDs come on if an error occurs.

If LED is solidly on, it may indicate a processor over-temperature condition. Initial processor over-temperature can cause symptoms such as sluggish computer performance. Chronic processor over-temperature can cause the computer to hang completely.

Troubleshooting:

- Verify proper heatsink installation.
- Verify all fans are operating properly, especially the fan array.
- If both overtemp LEDs come on immediately when the computer is turned on, a faulty power supply could be one cause of this behavior. Replace power supply.
- Try swapping CPU A and CPU B locations. If the CPU Error LED follows the CPU, replace that CPU.

3. EFI POST (Power On Self Test) LEDs

This group of eight LEDs are arranged into two sets of four LEDs, representing a binary code that only has any significance during the short time between power-on and the unit begins to boot the OS, while the CPU is executing EFI code only. At no other time should these LEDs be used or interpreted to mean anything meaningful.

The code is more easily described as two Hexadecimal digits ranging from $00 to $FF, to make it easier to list and compare during troubleshooting. Each ONE represents an LED that is ON, and each ZERO represents an LED that is OFF

Normal power-up LED sequence:

• The sequence of codes below is typical in the first few seconds of a functioning unit's boot cycle, immediately following power-on, during the EFI phase of startup.

• If your system is not booting you should check these LEDs closely to verify the sequence of codes has been executed in addition to your normal troubleshooting steps. Each code will only remain ON GREEN for a split-second each. The entire sequence takes only a few seconds to progress through.

• To see this sequence, power-on the unit (use the remote power on/off button on the logic board) while holding down the option key on an attached USB keyboard, to invoke the EFI startup manager and prevent the unit from leaving EFI and booting into any OS. Do this as you watch these LEDs as they progress through the following sequence:

Begin (power-on)

$Bx = 1 0 1 1 X X X X = All $Bx codes below are memory init codes (x may be any code 0 - F)

$BF = 1 0 0 1 1 1 1 1 = If the unit does not progress past any $Bx memory init codes, this could indicate a memory issue regardless of whether DIMM diagnostic error LEDs are ON or not.

$12 = 0 0 0 1 0 0 1 0 = After memory initialization has successfully completed

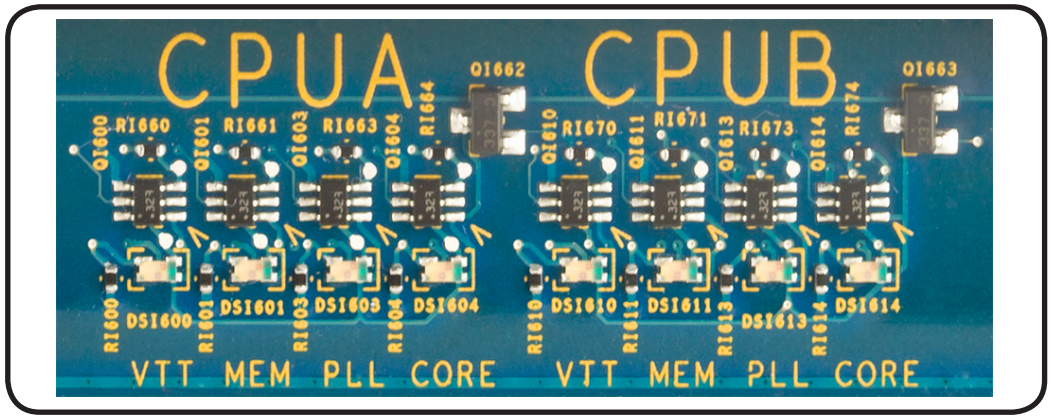
$51 = 0 1 0 1 0 0 0 1 = Video driver enabled beyond this point. Attached display should be displaying an image now. If not, this may indicate a graphics card issue.

$F9 = 1 1 1 1 1 0 0 1 = EFI finished and passed on control to OS boot loader

4. CPU Voltage LEDs

This group of LEDs will normally FLASH RED briefly during power-on, then should normally remain ON solidly GREEN when all voltage regulators are functioning properly to provide voltages to CPU A and CPU B, as well as IOH.

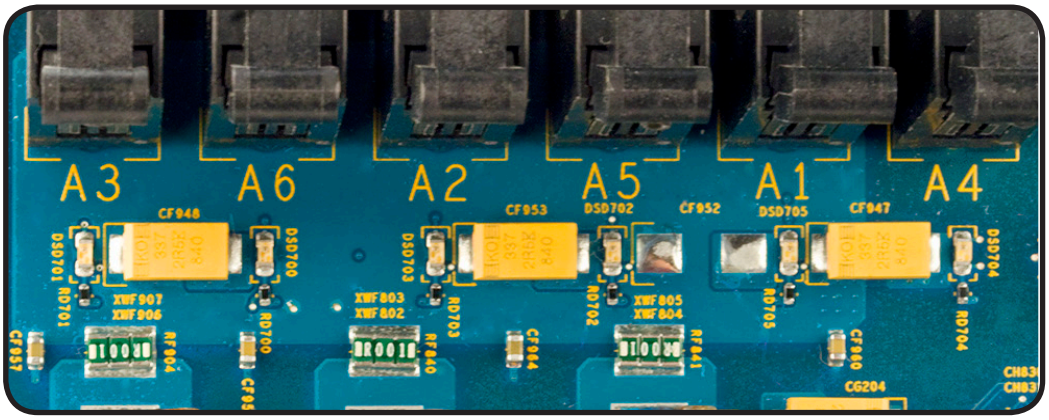
If any of these LEDs remain ON RED, this indicates that the corresponding voltage regulator is enabled but not providing any voltage output.

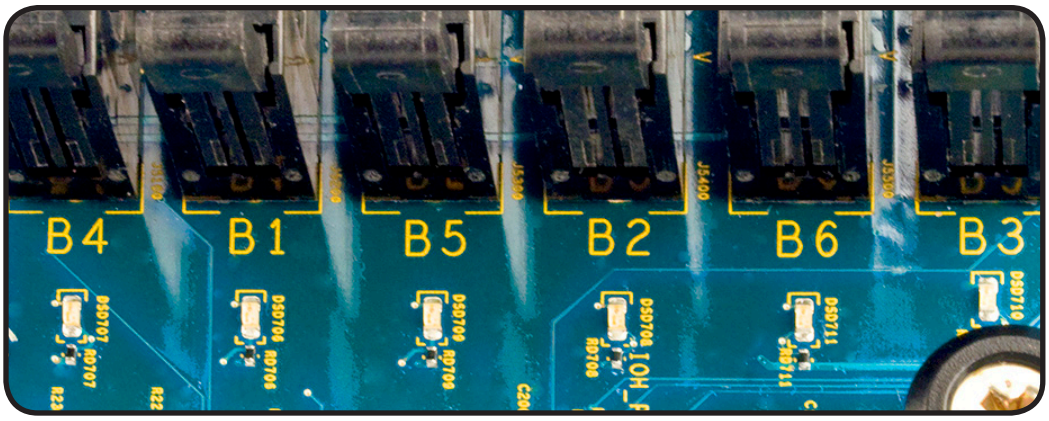


In single processor units the LED group for the second processor are not present.

5 & 6. Memory Diagnostic LEDs (A1 - A6 and B1 - B6)

This group of LEDs will normally remain OFF during power-on and throughout normal operation. If any of these LEDs come ON RED, this indicates that the corresponding DIMM (or its slot) may be faulty. To verify whether the fault lies with the DIMM or the slot, power down the unit and move the DIMM to another slot. If the DIMM is faulty, the LED adjacent to its new slot should come ON RED when power is reapplied. If a known-good DIMM is installed in the suspect slot and the LED adjacent to this slot should come ON RED , this may indicate a faulty DIMM slot on the logic board.





How to Troubleshoot Memory LEDs

1. Remove and reseat DIMM
2. Restart computer. If associated LED is no longer illuminated, issue is resolved
3. If associated LED remains illuminated, replace DIMM with new DIMM
4. Restart computer and verify LED is no longer illuminated

7. Reset Buttons

System Management Controller (SMC) Reset

The System Management Controller (SMC) is a chip on the logic board that controls all power functions for the Xserve. If the Xserve is experiencing any power issue, resetting the SMC may resolve it. The SMC controls several functions, including:

• Telling the Xserve when to turn on, turn off, sleep, wake, idle, and so forth

• Handling system resets from various commands

• Controlling the fans

It is also recommended that the SMC be reset on any new logic board after it is installed as part of a repair.

Note that resetting the SMC does not reset the PRAM. Resetting the SMC will not resolve issues in which the Xserve is unresponsive—in these situations, restarting the Xserve will generally suffice.

If the Xserve isn't responding, perform these steps one at a time, in the following order, until the issue has been resolved:

1. Force Quit (Option-Command-Escape)

2. Restart (Control-Command-Power)

3. Force Shut Down (press the power button for 10 seconds)

4. Remove the Xserve from the rack (if applicable)

5. Remove the Top Case

6. Press the SMC Reset button on the logic board

Resetting the SMC can resolve some Xserve issues such as not starting up, not displaying video, sleep issues, fan noise issues, and so forth. If the Xserve still exhibits these types of issues after you've restarted the Xserve, try resetting the SMC. There are two ways to reset the SMC on the Xserve.

System Management Control (SMC) Reset in Rack

1. Shut Down the Xserve, either locally or using remote commands (or if the Xserve is not responding, hold the power button until it turns off).

2. Unplug the AC power cord.

3. Wait at least 15 seconds.

4. Plug the power cord back in, making sure the power button is not being pressed at the time.

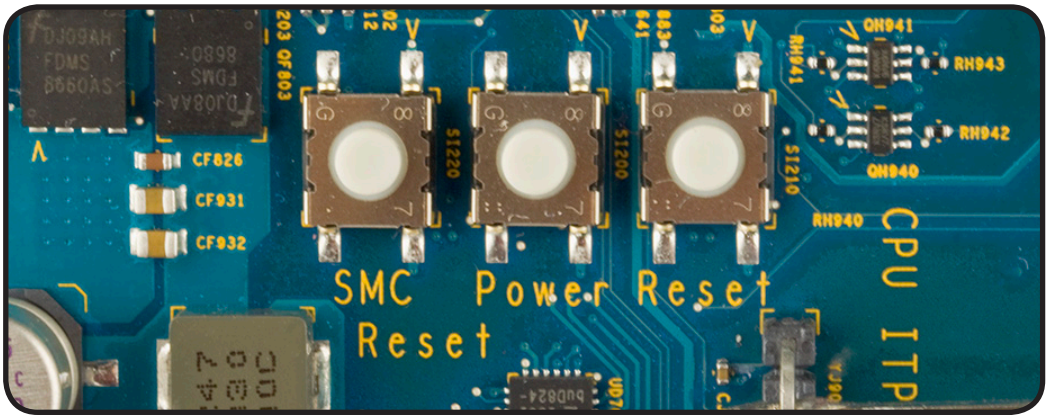
5. Press the power button to start up the Xserve.

Power ON / OFF Button

Behaves exactly like the front panel power button, and can be used as an alternate way to turn the unit on and off if needed.

Reset Buttons

When pressed, resets CPUs regardless of what is currently running. This reset overrides all software processes and restarts the system. Use with caution as this form of reset may corrupt software or files on a drive.



Drive Interconnect Backplane LEDs

Note: The following information describes the diagnostic LEDs present on the interconnect backplane.

This group of eight LEDs are arranged into two sets of four LEDs, representing information about the SATA / SAS communication between the drive controller channels on the drive interconnect backplane and the drive modules themselves. The optional SSD drive does not have a representative LED on this board.

There is also a 'heartbeat' LED on this board which starts flashing ON GREEN and OFF when EFI loads immediately after power-on and continues to flash ON and OFF during normal operation.

The first group of four LEDs indicates activity for the four I/O channels corresponding to the three drive bays. Since there are only three drive bays, the fourth I/O channel and LED are not used and should remain OFF during normal operation.

The second group of four LEDs indicates that the controller has recognized that a drive module is present and connected. These LEDs are normally solidly ON GREEN when no drive is present, and turn OFF when a drive module has been inserted into the corresponding drive

bay and the controller has recognized this event. The LED will turn ON GREEN again when the corresponding drive module has been removed from its bay.

Since there are only three drive bays, the fourth I/O channel and LED are not used and should remain ON GREEN during normal operation.

When you power-on the system, you should see the following activity sequence on these LEDs:

1. The entire group of eight LEDs should come ON solid GREEN when power is applied and remain on for a few seconds.

2. The heartbeat LED begins flashing when EFI loads in the first few second after power-on. The first group of four activity LEDs should now turn OFF. The second group of four 'drive present' LEDs should remain on for a few more seconds.

3. The second group of four 'drive present' LEDs should each turn OFF as the controller scans and recognizes each connected drive module in turn, from bay 1 to bay 3 in order. The fourth LED should remain ON since no drive is present on the fourth I/O channel.

4. Beyond this point, the only LEDs that should be flashing are among the first group of four drive activity LEDs, to indicate drive activity between a corresponding drive module, such as the boot drive module booting the OS, and the drive controller.

Symptom Charts

Follow the steps in the order indicated below. If an action resolves the issue, retest the system to verify. If the issue persists after retesting, return to step 1.

Startup and Power Issues

No Power / Dead Unit

Unlikely cause: Optical drive, hard drive(s), fan array, memory, RAID battery

Quick Check

Symptom	Quick Check
No Power / Dead Unit • No fan or drive module spin • No LED activity	**1.** Check the front panel on/standby light. This light should be solid white when the Xserve is running, and off when the Xserve is in standby mode. If it's flashing white, the Xserve is in sleep mode. **2.** Verify the power outlet and power cord are known good and that AC power is present. **3.** Check the power supply status light next to the power cord connector on the rear of the Xserve (check the LEDs for both supplies in a two-power-supply configuration). **4.** Solid green indicates power is available and Xserve should be on. **5.** Blinking green indicates AC power is available but power to the Xserve components from this supply is on standby (usually because the Xserve is turned off). **6.** Red indicates either no AC power is available to this supply from the power cord or this power supply has failed. **7.** Disconnect all external cables such as network, peripheral, and expansion card connections, and press the power button again.

Deep Dive

Check	Result	Action	Code
1. Press the SMC Reset button on the logic board to reset the SMC. Verify that the Xserve powers on	Yes	Issue resolved.	
	No	Go to Step 2	
2. Check internal diagnostic LEDs. Go to diagnostic LED section for more information. Verify that the Xserve powers on.	Yes	Issue resolved.	
	No	Go to Step 3	
3. Remove all three drive modules and press the power button. Verify that the Xserve powers on.	Yes	Suspect drive module(s) as cause. Go to Step 4	
	No	Go to Step 5	
4. Reconnect each one at a time, verifying unit operation as drive module is reinstalled. Verify that the Xserve powers on.	Yes	Repeat Step 4 until the drive module is isolated.	
	No	Failed drive module. Replace drive module. Issue resolved.	**H02**
5. Remove both internal PCI riser cards and any installed expansion cards and press the power button. Verify that the Xserve powers on.	Yes	Suspect PCI card(s) and/or riser card(s) as cause. Go to Step 6	
	No	Go to Step 7	
6. Reconnect each one at a time, verifying unit operation as card is reinstalled. Verify that the Xserve powers on.	Yes	Repeat Step 6 until the card is isolated.	
	No	Failed card. Replace card. Issue resolved.	**M17**
7. Verify that the power supply is properly connected to the power distribution board.	Yes	Go to Step 8	
	No	Ensure power supply is properly connected to the power distribution board. Go to step 8	
8. Verify the front panel board cable is properly connected at both ends.	Yes	Go to Step 9	
	No	Ensure the front panel board cable is properly connected at both ends. Go to step 9	
9. Reseat the front panel board. Verify that the Xserve powers on.	Yes	Issue resolved.	
	No	Go to Step 10	

10. Verify all cable connections to the logic board and drive interconnect backplane are secure.	Yes	Go to Step 11	
	No	Ensure all cable connections to the logic board and drive interconnect backplane are secure. Go to Step 11	
11. Replace the power supply. Verify that the Xserve powers on.	Yes	Issue resolved.	**P01**
	No	Go to Step 12	
12. Replace the power distribution board. Verify that the Xserve powers on.	Yes	Issue resolved.	**M01**
	No	Go to Step 13	
13. Replace the front panel board cable. Verify that the Xserve powers on.	Yes	Issue resolved.	**X03**
	No	Go to Step 14	
14. Replace the front panel board. Verify that the Xserve powers on.	Yes	Issue resolved.	**M01**
	No	Go to Step 15	
15. Replace the drive interconnect backplane. Verify that the Xserve powers on.	Yes	Issue resolved.	**M01**
	No	Go to Step 16	
16. Reseat both processors. Verify that the Xserve powers on.	Yes	Issue resolved.	
	No	Go to Step 17	
17. Replace both processors. Verify that the Xserve powers on.	Yes	Issue resolved.	**M08**
	No	Reinstall original processors. Replace the logic board.	**M08**

Burnt Smell or Odor

Quick Check

Symptom	Quick Check
Burnt Smell / Odor • System emits an odor or smell of smoke.	**1.** Disconnect the power cord from the system. **2.** Identify the source of the odor. **3.** Some odors may be present when operating normally. Refer to **http://support.apple.com/kb/TA22044**. Some visual clues may include brown marks on PCBs, and component damage i.e. transistors, ICs, inductors, capacitors, resistors etc. When certain components fail because of overheating the smell or odor clues may not be evident after the time of the incident. Some components may not be easily accessible for visual identification of possible failure. Important Note: Components may emit a brief non-continuous smoke or odor when the failure occurs. However this does not typically suggest a safety issue, however a thorough inspection should be made. During inspection you feel there may a safety issue with the System please notify Apple through the appropriate escalation routes.

Deep Dive

Check	Result	Action	Code
1. Verify source of the odor ie foreign contaminant such as fluid ingress, dust, hair etc	Yes	Cleanup foreign contaminant, replace any affected modules. Foreign contaminants are not covered by Apple warranties	**P08**
	No	Go to step 2	
2. Inspect PCB's and components for indications of a thermal event	Yes	Replace any affected modules	**P08**
	No	Go to step 3	
3. Verify System is functioning correctly	Yes	Some odors may be present when operating normally. Refer to **http://support.apple.com/kb/TA22044**	
	No	Please refer to best related troubleshooting section.	

Won't Start Up / No Video/ LED On

Unlikely cause: Fan array, front panel board, memory, optical drive, power distribution board, power supply, RAID battery

Quick Check

Symptom	Quick Check
Won't Startup / No Video / LED On • Xserve begins to power up but does not boot • Fan array and hard drive are spinning • Power LED is illuminated • No activity lights • No video on connected external display	**1.** Confirm the system configuration supports an external display. Not all configurations do, although the mini DisplayPort connector on the rear of the unit is present regardless. **2.** Verify that the rear System Identifier button on the back of the logic board aligns with the opening in the chassis back panel. If it does not, realign the logic board. **3.** Confirm at least one known good and compatible memory DIMM is installed in the system. **4.** After power-on, verify front panel power light is solidly on, and not flashing any error sequences indicating a memory failure. **5.** Connect known-good external bootable device, keyboard, and mouse, then press Option key during startup and select external startup device to bring up system for diagnostics. Run complete AXD diagnostics.

Deep Dive

Check	Result	Action	Code
1. Press the SMC Reset button on the logic board to reset the SMC. Verify Xserve boots from known good external bootable device	Yes	Issue resolved.	
	No	Go to Step 2	
2. Check internal diagnostic LEDs. Go to diagnostic LED section for more information. Verify Xserve boots from known good external bootable device.	Yes	Issue resolved.	
	No	Go to Step 3	
3. Remove all three drive modules and press the power button. Verify Xserve boots from known good external bootable device.	Yes	Suspect drive module(s) as cause. Go to Step 4	
	No	Go to Step 5	

4. Reconnect each one at a time, verifying unit operation as drive module is reinstalled. Verify Xserve boots from known good external bootable device.	Yes	Repeat Step 4 until the drive module is isolated.	
	No	Failed drive module. Replace drive module. Issue resolved.	**H02**
5. Remove both internal PCI riser cards and any installed expansion cards and press the power button. Verify Xserve boots from known good external bootable device.	Yes	Suspect PCI card(s) and/or riser card(s) as cause. Go to Step 6	
	No	Go to Step 7	
6. Reconnect each one at a time, verifying unit operation as card is reinstalled. Verify Xserve boots from known good external bootable device.	Yes	Repeat Step 6 until the card is isolated.	
	No	Failed card. Replace card. Issue resolved.	**M17**
7. Disconnect backplane-to-logic board cable. Verify Xserve boots from known good external bootable device.	Yes	Go to Step 8	
	No	Go to Step 9	
8. Replace drive interconnect backplane. Reconnect backplane-to-logic board cable. Verify Xserve boots from known good external bootable device.	Yes	Issue resolved.	**M01**
	No	Reinstall original drive interconnect backplane. Go to Step 9	
9. Replace backplane-to-logic board cable. Verify Xserve boots from known good external bootable device.	Yes	Issue resolved.	**X03**
	No	Go to Step 10	
10. Reseat both processors. Verify Xserve boots from known good external bootable device.	Yes	Issue resolved. Go to Step 13	
	No	Go to Step 11	
11. Replace both processors. Verify Xserve boots from known good external bootable device.	Yes	Issue resolved. Go to Step 13	**M02**
	No	Reinstall original processors. Go to Step 12	
12. Replace logic board Verify Xserve boots from known good external bootable device.	Yes	Issue resolved. Go to Step 13	**M02**
	No	Multiple module failure. Return to step 7.	

13. Reinstall user's original startup drive module. Verify Xserve boots from user's original startup drive module.	Yes	Issue resolved.	
	No	Replace user's original startup drive module. Start up from Server Install Disc and install server OS onto user's replacement startup drive module. Verify Xserve boots from replacement startup drive module. Issue resolved.	**H02**

Won't Start Up / No Video/ Activity LEDs Flashing

Quick Check

Symptom	Quick Check
Won't Boot / No Video / Activity LEDs Flashing In Sequence • Xserve begins to power up but does not boot • Fan array and hard drive are spinning • Power LED is illuminated • Top row of activity lights flash in sequence left to right and then right to left • No video on external display	**1.** Press the System Identifier button a few times. If the bottom row of activity lights illuminate from right to left each time you press this button, then it's likely that the System Identifier light is stuck in on either the front or rear panel. **2.** Verify that the rear System Identifier button on the back of the logic board aligns with the opening in the chassis back panel. Also check the front panel System Identifier button. If either button appears to be stuck in, follow the steps in the deep-dive section of this symptom. **3.** Connect known-good external bootable device, keyboard, and mouse, then press Option key during startup and select external startup device to bring up system for diagnostics. Run complete AXD diagnostics.

Deep Dive

Check	Result	Action	Code
1. Remove the front bezel and make sure the front System Identifier button is not stuck. Reseat the button if necessary. Verify Xserve boots from user's original startup drive module.	Yes	Issue resolved.	
	No	Go to Step 2	

2. Reseat the front panel board and its cable connectors. Verify Xserve boots from user's original startup drive module.	Yes	Issue resolved.	
	No	Go to Step 3	
3. Replace front panel board. Verify Xserve boots from user's original startup drive module.	Yes	Issue resolved.	**M02**
	No	Go to Step 4	
4. Reinstall original front panel board. Remove and re-seat logic board to enure rear panel System Identifier button is not stuck in. Verify Xserve boots from user's original startup drive module.	Yes	Issue resolved.	
	No	Replace logic board.	**M02**

Intermittent Shutdown

Unlikely cause: hard drive, optical drive

Quick Check

Symptom	Quick Check
Shutdown After Startup • System shuts down almost immediately after startup **Intermittent Shutdown** • System shuts down during normal use	**1.** Make sure the power cord is plugged in firmly. **2.** Check that the power source is turned on and the correct voltage is present. **3.** Make sure the air vents are clear. **4.** Replace the power cord. **5.** Connect keyboard and start up the system with shift key down for safe mode. **6.** Start up from known-good bootable device. **7.** Check system.log info for shutdown cause. **8.** Run AXD for sensors + thermal test. **9.** Verify that the rear System Identifier button on the back of the logic board aligns with the opening in the chassis back panel. If it does not, realign the logic board.

Deep Dive

Check	Result	Action	Code
1. Press the SMC Reset button on the logic board to reset the SMC. Verify Xserve no longer shuts down after starting up.	Yes	Issue resolved.	
	No	Go to Step 2	
2. Check internal diagnostic LEDs. Go to **diagnostic LED section** for more information. Follow recommendations therein. Verify Xserve no longer shuts down after starting up.	Yes	Issue resolved.	
	No	Go to Step 3	
3. Check that the fan array connector is connected and the fan array is operational. Verify Xserve no longer shuts down after starting up.	Yes	Go to Step 4	
	No	Reconnect or replace fan array as required.	**X18**
4. Verify that the heat sink is properly attached to the processor. Verify Xserve no longer shuts down after starting up.	Yes	Go to Step 5	
	No	Properly reattach heat sink to processor. Go to Step 5	
5. Verify that all thermal sensor cables are properly connected. Verify Xserve no longer shuts down after starting up.	Yes	Go to Step 6	
	No	Properly reconnect all thermal sensor cables. Issue Resolved.	**X18**
6. Replace the power supply. Verify Xserve no longer shuts down after starting up.	Yes	Issue resolved.	**P02**
	No	Reinstall original power supply. Go to Step 7	
7. Reseat both processors. Verify Xserve no longer shuts down after starting up.	Yes	Issue resolved.	
	No	Go to Step 8	
8. Replace both processors. Verify Xserve no longer shuts down after starting up.	Yes	Issue resolved.	**M08**
	No	Reinstall original processors. Replace the logic board.	**M08**

Kernel Panic/System Crashes

Quick Check

Symptom	Quick Check
Memory Issues/Kernel panic and freezes • Unit has kernel panic or freezes on startup or when operating • Memory not recognized in System Profiler or in Memory Slot Utility • Fans running fast	**1.** After power ON, verify Front Panel power LED illuminated, and not flashing any error sequences indicating a memory failure. **2.** Verify with known good and compatible memory DIMMs. Memory from older computers is not compatible and cannot be used. **3.** Ensure the compatible memory is filled in the correct order in the memory slots. If memory is not configured for the best performance the "Memory Slot Utility" will appear on screen and recommend an improved configuration. To use the utility again go to /System/Library/CoreServices/Memory Slot Utility **4.** Confirm total memory in System Profiler. **5.** Startup with 'Shift' key down for safe mode boot. Check panic.log info for crash cause. **6.** Startup from original install media, or known good boot device with compatible Mac OS X. **7.** Run all AXD diagnostic tests.

Deep Dive

Check	Result	Action	Code
1. Press the SMC Reset button on the logic board to reset the SMC. Verify Xserve no longer shuts down after starting up	Yes	Issue resolved.	
	No	Go to Step 2	
2. Check internal diagnostic LEDs. Go to diagnostic LED section for more information. Verify Xserve no longer shuts down after starting up.	Yes	Issue resolved.	
	No	Go to Step 3	

3. Disconnect all peripherals and expansion cards. Verify that Xserve starts without issue.	Yes	Suspect peripherals or expansion cards as cause. Reconnect one at a time, verifying system operation at each stage	
	No	System had kernel panic or freeze during Boot. Go to Step 4	
4. Verify all fans in fan array are spinning and there is adequate airflow inside and around the Xserve	Yes	All fans are spinning, and adequate airflow. Go to step 5	
	No	One or more fans are not spinning. Go to "Fast/Failed Fans" Flow	
5. Attempt to boot with original install media or from an external hard drive with compatible OS X installed. Verify the Xserve is able to successfully boot to the Finder.	Yes	System boots without kernel panic or freeze using external drive. Corrupt OS installed or damaged internal startup drive module. Run AXD/Disk Utility drive test and replace drive module if test fails. Clean Install with compatible Mac OS X	**H03**
	No	System had kernel panic or freeze during Boot. Go to Step 6	
6. Inspect if any memory error LED's illuminated. Install 1 only known good compatible memory DIMM in memory slot#1. Verify System boots without kernel panic or freeze.	Yes	System boot without kernel panic or freeze with only 1 DIMM installed. Re-install the customer memory (using optimized recommend configurations) until the at fault memory is identified. Use extra known good memory to identify the faulty memory module. Replace the faulty memory module.	**X01**
	No	System had kernel panic or freeze during Boot. Replace logic board.	**M05**

Uncategorized Symptom

Quick Check

Symptom	Quick Check
Uncategorized Symptom Unable to locate appropriate symptom code	Verify whether existing symptom code applies to the issue reported by the user. If not, document reported symptoms and send feedback to smfeedback@apple.com stating that suitable symptom code could not be found.

Mass Storage

Apple Drive Module Read/Write Issue

Unlikely cause: Optical drive, logic board, processors.

Quick Check

Symptom	Quick Check
Read/Write Issues / Bad Blocks / Drive Formatting Issues • Cannot save documents • Read/Write error message • Hang when accessing or saving data. • Intermittent unexpected hanging • Slow drive module performance	**1.** Reseat any affected drives into other bays. **2.** Boot from Install DVD. Verify S.M.A.R.T. status of the affected hard drive using Disk Utility. **3.** Repair the affected hard drive using Disk Utility. **4.** Start up system normally and check system.log file for any volume remapping messages. A few of these messages at random intervals are typical of normal hard drive behavior and can be safely ignored. Excessive numbers of remapped blocks (i.e. dozens or hundreds), especially in a short period of time, could indicate an imminently failing drive module or other serious hardware issue.

Deep Dive

Check	Result	Action	Code
1. Press the SMC Reset button on the logic board to reset the SMC. Verify that the Xserve now recognizes the drive module.	Yes	Issue resolved.	
	No	Go to Step 2	
2. Check internal diagnostic LEDs. Go to diagnostic LED section for more information. Verify that the Xserve now recognizes the drive module.	Yes	Issue resolved.	
	No	Go to Step 3	
3. Start up from Install disc and launch Disk Utility. Is user's drive module available for Disk Utility to repair?	Yes	Go to Step 4	
	No	Go to Step 5	

4. Run Repair Disk on the volume using Disk Utility. Did Disk Utility mount and repair volume successfully?	Yes	Return to Quick Checks to verify that the drive module no longer has read-write errors.	
	No	Go to Step 5	
5. Remove the original drive module from the Xserve and inspect it for any damage to its connector or the connector in that drive bay of the Xserve. Is damage present?	Yes	Do not re-install the drive module if its connector is damaged or if the drive bay connector in the Xserve is damaged. If there is any visible damage, replace the damaged component.	**M19 H01**
	No	Go to Step 6	
6. Substitute a known-good drive module. Format this drive module using Disk Utility and select 'zero all data' option to remap bad blocks. Verify this drive module formats successfully with no significant errors or large numbers of bad blocks using Disk Utility log.	Yes	User's drive module appears to be defective. Replace defective drive module with new replacement drive module of same or larger capacity. Format this drive module using Disk Utility and select 'zero all data' option to remap bad blocks. Verify this drive module formats successfully with no significant errors or large numbers of bad blocks using Disk Utility log.	**H03**
	No	Go to Step 7	
7. Reseat connectors on both ends of the Backplane-to-Logic Board I/O Cable. Format known-good drive module using Disk Utility and select 'zero all data' option to remap bad blocks. Verify this drive module formats successfully with no significant errors or large numbers of bad blocks using Disk Utility log.	Yes	Issue resolved.	
	No	Go to Step 8	

8. Replace the Backplane-to-Logic Board I/O Cable. Format known-good drive module using Disk Utility and select 'zero all data' option to remap bad blocks. Verify this drive module formats successfully with no significant errors or large numbers of bad blocks using Disk Utility log.	Yes	Issue resolved.	**X03**
	No	Go to Step 9	
9. Replace Drive Interconnect Backplane. Format known-good drive module using Disk Utility and select 'zero all data' option to remap bad blocks. Verify this drive module formats successfully with no significant errors or large numbers of bad blocks using Disk Utility log.	Yes	Issue resolved.	**M19**
	No	Replace logic board. Reinstall original drive module. Format this drive module using Disk Utility and select 'zero all data' option to remap bad blocks. (Caution, doing this will erase all user data on this drive. Ensure user has this data backed up before proceeeding). Verify this drive module formats successfully with no significant errors or large numbers of bad blocks using Disk Utility log. Issue resolved.	**M19**

Apple Drive Module Not Recognized/Mounting

Unlikely cause: Optical drive, logic board, processors.

Quick Check

Symptom	Quick Check
• Non-startup drive module not recognized by system / not mounting after system is booted.	**1.** Verify drive bay lock is not activated. If it is, place the drive bay lock in the unlocked position. **2.** Reseat the drive module. **3.** Boot from Install DVD. Verify S.M.A.R.T. status of drive module using Disk Utility. **4.** Run complete AXD diagnostics.

Deep Dive

Check	Result	Action	Code
1. Press the SMC Reset button on the logic board to reset the SMC. Verify that the Xserve now recognizes the drive module.	Yes	Issue resolved.	
	No	Go to Step 2	
2. Check internal diagnostic LEDs. Go to diagnostic LED section for more information. Verify that the Xserve now recognizes the drive module.	Yes	Issue resolved.	
	No	Go to Step 3	
3. Start up from Install disc and launch Disk Utility. Is user's drive module available for Disk Utility to repair?	Yes	Go to Step 4	
	No	Go to Step 5	
4. Run Repair Disk on the volume using Disk Utility. Did Disk Utility mount and repair volume successfully?	Yes	Go to Step 11	
	No	Go to Step 5	
5. Remove the original drive module from the Xserve and inspect it for any damage to its connector or the connector in that drive bay of the Xserve. Is damage present?	Yes	Do not re-install the drive module if its connector is damaged or if the drive bay connector in the Xserve is damaged. If there is any visible damage, replace the damaged component.	**M19 H01**
	No	Go to Step 6	
6. Replace the user's drive module that is not mounting with a known-good drive module in the same bay. Verify that the Xserve now recognizes the drive module.	Yes	Replace failed drive module. Issue resolved.	**H01**
	No	Go to Step 7	
7. Reseat connectors on both ends of the Backplane-to-Logic Board I/O Cable and retest. Verify that the Xserve now recognizes the drive module.	Yes	Issue resolved.	
	No	Go to Step 8	

8. Remove and re-seat Drive Interconnect Backplane and retest. Verify that the Xserve now recognizes the drive module.	Yes	Issue resolved.	**X03**
	No	Go to Step 9	
9. Replace the Backplane-to-Logic Board I/O Cable and retest. Verify that the Xserve now recognizes the drive module.	Yes	Issue resolved.	**X03**
	No	Reinstall the Backplane-to-Logic Board I/O Cable. Go to Step 10	
10. Replace Drive Interconnect Backplane and retest. Verify that the Xserve now recognizes the drive module.	Yes	Issue resolved.	**M19**
	No	Reinstall original drive interconnect backplane. Replace logic board. Issue resolved.	**M19**
11. Start up from user's startup volume. Verify that the Xserve now recognizes the drive module.	Yes	Issue resolved.	
	No	Go to Step 5	

Apple Drive Module Noisy

Unlikely cause: Drive interconnect backplane, expansion cards, expansion slot riser cards

Quick Check

Symptom	Quick Check
Drive Module Noisy • Noise during boot • Noise during operation • Noise when drive is copying or saving data	**1.** Test with known good media to see if noise is Optical drive related. **2.** Check with Activity Monitor for any hard drive access when assessing idle drive noise. An example is Spotlight indexing in the background. **3.** Verify if operational noises are excessive when compared to another same model Xserve. **4.** Boot from a known good Mac OS source to eliminate possible software issues. **5.** Boot from Install DVD. Verify S.M.A.R.T. status of the affected drive module using Disk Utility. **6.** Reseat any affected drive modules into other bays. **7.** Repair any affected drive modules using Disk Utility.

Deep Dive

Check	Result	Action	Code
1. Boot from Install DVD and launch Disk Utility. Is the affected drive module available for Disk Utility to repair?	Yes	Go to Step 2	
	No	Replace affected drive module or branch to "Drive module not recognized/mount" troubleshoot guide	**H01**
2. Repair the affected drive module using Disk Utility and verify it completed successfully	Yes	Go to Step 3	
	No	Go to Step 4	
3. Remove the customer drive module(s), boot the System from an external drive, verify if the System remains excessively noisy.	Yes	Fan noise or Optical Drive noise likely to be the cause. See Optical Drive Noisy table and Fan Failures/Thermal issues table .	
	No	Go to step 4	
4. Remove the customer drive module(s), install a known good drive module and verify if the noise level is similar to customer's drive modules.	Yes	Drive module(s) noise levels are similar to a known good drive. No repair required	
	No	Replace the affected drive module. Issue resolved.	**H06**

Optical Drive Read/Write Issue

Quick Check

Symptom	Quick Check
Optical Drive Read/Write Data Error • Errors when writing optical media • Errors when reading optical media • Hang when accessing or preparing to write data.	**1.** Test optical media in another drive of the same type in same type of machine to rule out the media issue. **2.** For write issues, check with known-good media that performs well in another computer and optical drive of the same type. **3.** Check both CD and DVD media. If only one type of media is producing errors, there is a laser issue. (J99)

Deep Dive

Check	Result	Action	Code
1. Is media free to spin without optical drive scraping edge or surface of media?	Yes	Go to Step 2	
	No	Replace optical drive.	**J03**
2. Can optical drive read both CD and DVD known-good media?	Yes	Go to Step 6	
	No	Reading CD only or DVD only indicates laser issue, replace optical drive. Optical drive cannot read any media reliably, Go to Step 3.	**J03**
3. Reseat cable connections at logic board and optical drive. Verify that media is now recognized and reads reliably.	Yes	Reseat resolved issue.	
	No	Go to Step 4.	
4. Disconnect optical drive by lifting SATA cable at logic board and connecting a known-good optical drive. Verify that media is now recognized and reads reliably.	Yes	SATA port functional, reconnect user's optical drive & SATA cable. Go to Step 5.	
	No	Replace logic board.	**M19**

5. Install and test with replacement optical drive SATA flex cable. Verify that media is now recognized and reads reliably.	Yes	Cable change resolved issue.	**X03**
	No	Replace the optical drive. (Mechanical damage to optical drive, if found)	**J01 (J05)**
6. Test write data to compatible CD and DVD media. Verify burned media is recognized and reads reliably.	Yes	Issue resolved.	
	No	Replace the optical drive. (Mechanical damage to optical drive, if found)	**J03 (J06)**

Optical Drive Not Recognized/Mount

Quick Check

Symptom	Quick Check
Optical Drive Not Recognized/ Mount • Discs inject and eject, but do not appear in Finder.	**1.** Make sure the Xserve is unlocked. **2.** Use System Profiler ATA section to see if the optical drive appears. **3.** Check Finder Preferences: General and make sure CD's, DVD's and iPod's is checked under "Show these items on the Desktop." **4.** Check both CD and DVD media. If only one type of media is recognized, there might be a laser related issue. (J99)

Deep Dive

Check	Result	Action	Code
1. Is optical drive listed in the device tree for SATA devices in System Profiler?	Yes	Test with a known good CD/ DVD media. Did media appear in Finder? Issue resolved.	
	No	Go to step 2.	

2. Verify all connections between logic board, flex cable, optical drive are secure. Visually inspect cables and connectors for any debris, damage, or bent pins. Is optical drive now listed in System Profiler?	Yes	Issue resolved.	
	No	Replace any damaged cables and retest. If connections are good and with no visible cable damage, go to step 3.	**X03**
3. Disconnect optical drive by lifting SATA cable at logic board and connecting a known-good drive. Is optical drive now listed in System Profiler?	Yes	SATA port functional, reconnect user's optical drive & SATA cable. Go to Step 4.	
	No	Replace logic board.	**M19**
4. Install and test with replacement optical drive SATA flex cable. Is optical drive now listed in System Profiler?	Yes	Cable change resolved issue	**X03**
	No	Replace the optical drive. (Mechanical damage to optical drive, if found)	**M19**
5. Install and test with replacement optical drive SATA flex cable. Verify that media is now recognized and reads reliably.	Yes	Cable change resolved issue.	**J03**
	No	Replace the optical drive. (Mechanical damage to optical drive, if found)	**J03 (J05)**

Optical Drive Noisy

Quick Check

Symptom	Quick Check
Optical Drive Noisy • Noisy during boot • Noisy during operation • Noisy when drive is copying or writing data.	**1.** Test optical media in another drive of same type in same type of computer to rule out media issue. **2.** Check with known-good discs. **3.** Check to see if noise occurs without media in the drive. If so, check for hard drive (H06) and fan (M18) caused noises.

Deep Dive

Check	Result	Action	Code
1. Is optical drive constantly seeking or cycling eject mechanism without an optical disc installed? Optical drive should perform only one reset sequence and rest idle, ready for media.	Yes	Continue and verify with media, Go to Step 2.	
	No	Replace optical drive if continuous activity occurs with no disc installed.	**J04**
2. Insert known good data CD. Is media free to spin without optical drive scraping edge or surface of media? Verify disc does not exceed maximum thickness specification.	Yes	Continue and verify with media, Go to Step 3.	
	No	Internal mechanical interference is affecting rotational spin of media, replace optical drive.	**J04**
3. Initial disc handling noise is normal. Disc spinning and head seek indicate disc is mounting to desktop. Seek noise should settle down once mounted. Is noise above normal and related to seek activity?	Yes	Replace optical drive.	**J04**
	No	Go to Step 4.	
4. Disc spin should cease 30 seconds after mounting data CD on OS desktop. Is the noise related to disc spin?	Yes	Go to Step 5.	
	No	Go to Step 6.	
5. Remove the optical drive and check for the correct seating of the brackets on the optical drive and in the top case. Reinstall drive in unit and retest. Verify if drive is still noisy.	Yes	Go to Step 6.	**X03**
	No	Issue resolved. Optical drive was not properly mounted in enclosure. (Possible physical damage to optical drive.)	**(J05)**
6. Eject known good data CD. Disc handling noise should be one pop of disc from motor hub and a motor gear sound driving disc out of optical drive. Is noise above normal and related to disc eject activity or multiple eject attempts		Replace optical drive.	**J07**
	No	Go to Step 7.	

7. Disc spin should cease 30 seconds after mounting data CD on desktop. Media may be mounting on a defective internal spindle hub. Is the noise related to disc spin?	Yes	Replace optical drive.	**J04**
	No	Noise does not appear to be related to optical drive.	

Optical Drive Not Performing to Specs

Quick Check

Symptom	Quick Check
Optical Drive Not Performing to Spec • Read of write speeds slower than expected.	**1.** Test optical media in another drive of the same type in same type of computer to rule out media issue. **2.** Check with known-good discs. Install discs that came with the computer. **3.** For disc write issues, check with known good media that performs well in another computer and drive of the same type. **4.** Check both CD and DVD media. If only one type of media is producing errors, there might be a laser related issue. (J99)

Deep Dive

Check	Result	Action	Code
1. Can optical drive read both CD and DVD known-good media?	Yes	Go to step 5	
	No	Reading CD only or DVD only indicates laser issue, replace optical drive. Optical drive cannot read any media reliably. Go to step 2.	**J03**
2. Reseat cable connections at logic board and optical drive. Verify that media is now recognized and reads reliably.	Yes	Reseat resolved issue	**X03**
	No	Go to step 3	

3. Disconnect optical drive by lifting SATA cable at logic board and connecting a known-good drive. Verify that media is now recognized and reads reliably.	Yes	SATA port functional, reconnect user's optical drive & SATA cable. Go to Step 4.	
	No	Replace logic board.	**M19**
4. Install and test with replacement optical drive SATA flex cable. Verify that media is now recognized and reads reliably.	Yes	Cable change resolved issue.	**X03**
	No	Replace optical drive. (Mechanical damage to optical drive, if found)	**J03 (J05)**
5. Test write data to compatible CD and DVD media. Verify burned media is recognized and reads reliably.	Yes	Issue resolved.	
	No	Replace optical drive. (Mechanical damage to optical drive, if found)	**J03 (J06)**

Optical Drive Won't Accept/Reject Media

Quick Check

Symptom	Quick Check
• Cannot insert a disc into the drive. • Cannot eject a disc placed into the drive.	**1.** Inspect optical drive slot for obstructions. Make sure the white shipping bracket is not in place. **2.** If Xserve is locked, unlock it. **3.** Verify the disc is not warped.

Deep Dive

Check	Result	Action	Code
1. Verify the disc is not the wrong size. **Refer to article HT2446** "Macintosh: Using Nonstandard Discs in disc-ROM or DVD-ROM Drives."	Yes	Remove non-standard media and retest the drive with known good media.	
	No	Inspect System Profiler. Go to step 2.	

2. Verify the optical drive listed in the device tree for ATA devices in System Profiler?	Yes	Optical drive has power, inspect disc acceptance. Re-inspect for non standard media.	
	No	Inspect and reseat cables. Go to step 3.	
3. Verify all cable connections between optical drive and logic board are secure. Visually inspect cables and connectors for any debris, damage, or bent pins. Is optical drive now listed in System Profiler?	Yes	Optical drive has power, inspect disc acceptance. Re-inspect for disc acceptance and inspect for any non standard media.	
	No	Replace or reseat any damaged or loose cables and retest. If connections are good and with no visible cable damage, go to step 4.	**X03**
4. Connect a known good optical drive assembly. Is optical drive now listed in System Profiler?	Yes	SATA port functional, recoonect user's optical drive & SATA cable. Go to step 5.	
	No	Replace logic board.	**M19**
5. Install and test user's optical drive with replacement SATA flex cable. Is optical drive now listed in System Profiler?	Yes	Cable changed resolved issue.	**X03**
	No	Replace the optical drive. (Mechanical damage to optical drive, if found)	**J03 (J06)**
6. With replacement flex cable and replacement optical drive is the device seen in System Profiler?	Yes	Issue resolved.	
	No	Replace logic board.	

Optical Drive Won't Eject Media

Quick Check

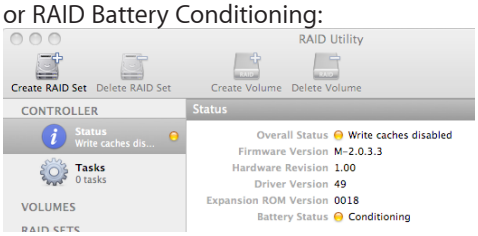
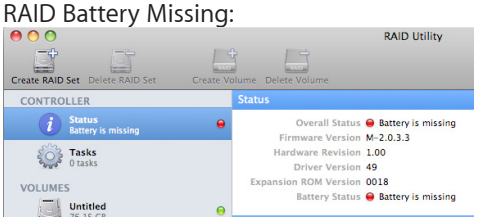
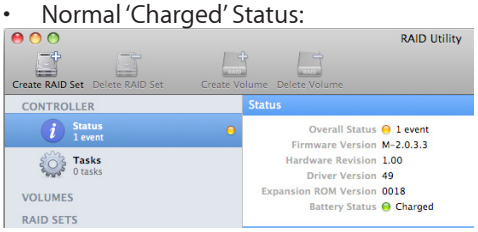
Symptom	Quick Check
• Can't eject disc from optical drive	**1.** If the Xserve is locked, unlock it. **2.** Verify the disc is not in use by the system. **3.** Drag the disc icon to the trash or select it and press Command + E. **4.** Connect a USB mouse and restart the Xserve while holding down the mouse button to attempt to eject the disc.

Deep Dive

Check	Result	Action	Code
1. Verify that the bezel over the slot is not bent. If it is, gently bend it back into position.	Yes	Issue resolved.	
	No	Go to step 2.	
2. Verify the disc is not the wrong size. Refer to article 58641 "Macintosh: Using Nonstandard Discs in disc-ROM or DVD-ROM Drives."	Yes	Remove irregular shaped media and retest.	
	No	Go to step 3.	
3. Reseat the optical drive cable at both connectors.	Yes	Issue resolved.	
	No	Go to step 4.	
4. Replace the optical drive cable.	Yes	Issue resolved.	**X03**
	No	Go to step 5.	
5. Replace the optical drive. Insert known good media and attempt to eject. Does the media eject without issue?	Yes	Issue resolved with replacement drive.	**J02**
	No	Repeat process with another known good drive and known good media.	

RAID Battery Not Charging

Quick Check

Symptom	Quick Check
RAID Battery Will Not Charge • The following messages may be displayed in RAID Utility: The Apple RAID Card Installed in your system requires your attention:  Write Caches Disabled, and/ or RAID Battery Conditioning:  RAID Battery Missing:  • The RAID battery status never achieves 'Charged' status: • Normal 'Charged' Status:  	**1.** If write caches are disabled: The RAID card backup battery may not be fully charged. To protect your data, the RAID card automatically disables write caching whenever the battery is not fully charged. Once every three months the RAID card reconditions the battery by completely discharging and then recharging it. **2.** If the battery is not fully charged: Every three months, the RAID card automatically reconditions its battery by completely discharging and then recharging it. During the reconditioning cycle, you may see an alert advising you that the 72-hour battery reserve is unavailable and the controller status may indicate that write caches are disabled. Performance may be slightly degraded during this time, but will return to normal when the battery is fully recharged. **3.** In most cases, leaving the Xserve powered ON continuously for 72 hours or more (not in Standby and not in Sleep mode, but actually powered ON without interruption) gives the charging system sufficient time to fully charge the battery and restore the write caches to full functionality. **4.** Examine Xserve log files for clues and run complete AXD diagnostics on the Xserve to gather more information before continuing to the Deep Dive section of this symptom.

Deep Dive

Check	Result	Action	Code
1. Disconnect RAID battery connector from drive interconnect backplane. Using a multimeter set to measure DC voltage in the 4 volt range, connect the multimeter probes to the extreme end connector pins of the RAID battery connector.	Yes	Go to Step 2	
2. Does the multimeter measure at least 3.5 VDC?	No	Replace battery. Go to Step 2	**P10 - Battery will not charge P11 - Battery not recognized**
3. Reconnect RAID battery connector to drive interconnect backplane. Start up Xserve and check RAID Utility to verify battery is recognized and is charging / conditioning.	Yes	Go to Step 3	
4. Is battery recognized and charging / conditioning?	No	Replace drive interconnect backplane (RAID backplane). Go to Step 2	**M20**
5. Wait 72 continous hours with Xserve powered ON for the RAID battery to fully charge. Check RAID Utility to verify battery continues to be recognized and has fully charged. Has battery fully charged?	Yes	Issue resolved.	
	No	Replace drive interconnect backplane (RAID backplane). Go to Step 2	**M20**

See **Mac Pro RAID Card and Xserve RAID Card: Frequently Asked Questions (FAQ) - HT1346**

Uncategorized Symptom

Quick Check

Symptom	Quick Check
Uncategorized Symptom Unable to locate appropriate symptom code	Verify whether existing symptom code applies to the issue reported by the user. If not, document reported symptoms and send feedback to smfeedback@apple.com stating that suitable symptom code could not be found.

Input/Output Devices

Rear USB Port Does Not Recognize Known Devices

Quick Check

Symptom	Quick Check
Rear USB Port Does Not Recognize Known Devices • USB devices not recognized on the rear USB port.	**1.** If the Xserve is locked, unlock it. **2.** Check the for latest software updates for Apple and especially third party devices. **3.** Use System Profiler to verify the System recognizes each of the USB buses in the USB device tree. **4.** Test both rear ports with known good Apple keyboard or mouse. **5.** Test front USB port with known good Apple keyboard or mouse. **6.** Verify any external USB device with large power requirements have their own external power supplies. **7.** Verify external USB device cables by using known good cables.

Deep Dive

Check	Result	Action	Code
1. Disconnect all peripherals except for a known good Apple USB device.	Yes	Go to step 2	
	No	Repeat Step 1	
2. Verify the USB ports are free from contaminants and debris.	Yes	Go to step 3	
	No	Remove contaminants and debris. Replace affected modules if necessary. Defects caused by contaminants or debris are not covered by Apple warranty. Go to step 3.	

3. Reset SMC. Verify each of the USB buses are recognized, and a known good connected USB device is recognized?	Yes	Issue resolved. Issue maybe caused by another peripheral device.	
	No	Replace Logic Board.	**M15**

Front USB Port Does Not Recognize Known Devices

Quick Check

Symptom	Quick Check
Front USB Port Does Not Recognizing Known Devices • USB devices not recognized on the front USB port.	**1.** If the Xserve is locked, unlock it. **2.** Check the for latest software updates for Apple and especially third party devices. **3.** Use System Profiler to verify the System recognizes each of the USB buses in the USB device tree. **4.** Test both rear ports with known good Apple keyboard or mouse. **5.** Verify any external USB device with large power requirements have their own external power supplies. **6.** Verify external USB device cables by using known good cables.

Deep Dive

Check	Result	Action	Code
1. Disconnect all peripherals except for a known good Apple USB device.	Yes	Go to step 2	
	No	Repeat Step 1	
2. Verify the USB ports are free from contaminants and debris.	Yes	Go to step 3	
	No	Remove contaminants and debris. Replace affected modules if necessary. Defects caused by contaminants or debris are not covered by Apple warranty. Go to step 3.	

3. Reset SMC. Verify each of the USB buses are recognized, and a known good connected USB device is recognized?	Yes	Issue resolved. Issue maybe caused by another peripheral device.	
	No	Go to step 4.	
4. Reseat the Front Panel Board cable.	Yes	Issue resolved.	
	No	Replace Front Panel Board.	**M15 N08**

FireWire Port Does Not Recognize Known Devices

Quick Check

Symptom	Quick Check
FireWire Port Does Not Recognize Known Devices • FireWire devices not recognized.	**1.** If the Xserve is locked, unlock it. **2.** Check the for latest software updates for Apple and especially third party devices. **3.** Use System Profiler to verify the System recognizes each of the FireWire busses in the FireWire device tree. **4.** Test both rear ports with known good FireWire device and cable. **5.** Verify any external FireWire device with large power requirements have their own external power supplies. **6.** Verify external FireWire device cables by using known good cables. **7.** Reset PRAM/NVRAM.

Deep Dive

Check	Result	Action	Code
1. Disconnect all peripherals except for a known good FireWire device and cable.	Yes	Go to step 2	
	No	Repeat Step 1	

2. Verify the FireWire ports are free from contaminants and debris.	Yes	Go to step 3	
	No	Remove contaminants and debris. Replace affected modules if necessary. Defects caused by contaminants or debris are not covered by Apple warranty. Go to step 3.	
3. Reset SMC. Verify each of the FireWire busses are recognized, and a known good connected Firewire device is recognized?	Yes	Issue resolved. Issue maybe caused by another peripheral device.	
	No	Replace Logic Board.	**M12**

PCI-E Expansion Card/Slot Not Recognized

Quick Check

Symptom	Quick Check
I/O Expansion Issues • Expansion riser/slot issues • Can't detect expansion card	**1.** For Ethernet card issues, make sure to configure using Network System Preference **2.** For Fibre channel card issues, make sure to configure using Fibre Channel Utility. **3.** For SCSI card issues, make sure to configure using Disk Utility. **4.** Check System Profiler to see if the card is recognized. **5.** Reset PRAM/NVRAM **6.** Run AXD diagnostics and check log files.

Deep Dive

Check	Result	Action	Code
1. Does the expansion card meet the requirements for the slot in which it is being used?	Yes	Go to step 2.	
	No	Refer to product specifications of Xserve then recommend the card be replaced with the proper specification type of model.	
2. Reset SMC.	Yes	Issue resolved.	
	No	Go to step 3.	
3. Reseat the expansion card.	Yes	Issue resolved.	
	No	Go to step 4.	
4. Reseat the PCI riser card into the logic board, and retest the card in the same slot.	Yes	Issue resolved.	
	No	Go to step 5.	
5. Test the expansion card in the other expansion slot, if available, ensuring the card being tested meets the requirements of the slot.	Yes	Issue resolved.	
	No	Go to step 6.	
6. Test with a different known good compatible card in the same type of slot.	Yes	Issue resolved.	
	No	Go to step 7.	
7. Test with a known good PCI riser card.	Yes	Issue resolved.	
	No	Replace Logic Board.	**M17**
8. Does the expansion card work with the replacement logic board?	Yes	Issue resolved.	
	No	Repeat steps 3-7.	

Uncategorized Symptom

Quick Check

Symptom	Quick Check
Uncategorized Symptom Unable to locate appropriate symptom code	Verify whether existing symptom code applies to the issue reported by the user. If not, document reported symptoms and send feedback to smfeedback@apple.com stating that suitable symptom code could not be found.

Communications

Ethernet Port/Device Issues

Quick Check

Symptom	Quick Check
Network Issues • Server cannot be seen on network • Slow network performance	**1.** Open the Network system preference pane and select the built-in Ethernet option. **2.** If only one Ethernet port is in use, verify that it is the right hand (1) port. If it is not, move the Ethernet cable to the right hand (1) port. This is the primary (en0) port. **3.** Boot the Xserve from the Installation disc. Go to another computer on the same subnet and start Server Assistant. If the Xserve can be seen, the Xserve hardware should be functioning correctly. Check the software configuration on the Xserve, or reinstall and reconfigure the Xserve. **4.** Try a known-good Ethernet cable. **5.** Clear parameter RAM (PRAM). Hold down Command-Option-P-R during startup. (You must unlock the Xserve to perform PRAM reset) **6.** Try connecting to a known-good Ethernet port at the wall or external hub. **7.** Verify that other users are experiencing the same problem. If so, contact the network administrator.

Deep Dive

Check	Result	Action	Code
1. Is the Ethernet network connected to an Ethernet expansion card in the Xserve?	Yes	See expansion card troubleshooting section.	
	No	Using built-in Ethernet. Go to step 2.	

2. Visually inspect Ethernet connector to ensure all pins will make physical contact with CAT5 or better network cable.	Yes	Ethernet interface contacts are good. Go to step 3.	
	No	Pins are damaged or bent flat, replace logic board.	**M10**
3. Isolate OS by booting from original install media. Verify network link status active by using Network Utility on install DVD and looking for link LED adjacent to connected Ethernet port. If the Ethernet interface (en0) link status is inactive, recheck physical connection and link activity indicator on hub/ switch.	Yes	Right-hand (1) Ethernet interface (en0) Link Status is active, go to step 4.	
	No	Right-hand (1) Ethernet interface (en0) Link Status is inactive. Replace logic board.	**M10**
4. Disconnect Xserve and connect known-good computer to network using the same Ethernet cable. Verify if IP address is listed for the Ethernet interface in System Preferences: Network. Retest.	Yes	Go to step 5.	
	No	If connection is OK on known-good system, replace logic board.	**M10**
5. Verify connection by using Network Utility to ping another connected computer on the same subnet. Ensure the target computer, IP address is valid, on the same subnet and powered on. Ensure no MAC address filtering or hardware access control devices are present. Use a simple hub/ switch environment. Is ping successful?	Yes	Go to step 6.	
	No	If the symptoms do not change, replace the logic board.	**M10**

6. Verify Ethernet performance and reliability by starting up from a known-good OS install, and downloading a large file from a web site or file server.	Yes	If there is performance or connectivity issue isolated solely to the system under test, the problem may be the network environment. No repair is necessary.	
	No	If there are connection dropouts or poor performance not seen on a known-good test system, replace the logic board.	**M10**

Uncategorized Symptom

Quick Check

Symptom	Quick Check
Uncategorized Symptom Unable to locate appropriate symptom code	Verify whether existing symptom code applies to the issue reported by the user. If not, document reported symptoms and send feedback to smfeedback@apple.com stating that suitable symptom code could not be found.

Video

Video Distortion

Quick Check

Symptom	Quick Check
Video is distorted • Bad/Dim color • Lines or artifacts • Distortion/garbled video	**1.** Refer to the adjustments section of the owner's manual for the external display. Adjust display as necessary. **2.** Reseat the Mini DisplayPort adapter and cable connections. **3.** Inspect the Mini DisplayPort adapter pins and replace the adapter if necessary. **4.** Reset PRAM/NVRAM. (You must unlock the Xserve to perform) **5.** Test with a known good display. **6.** Run complete AXD Diagnostics

Deep Dive

Check	Result	Action	Code
1. Reseat the mezzanine video card	Yes	Issue resolved.	
	No	Replace the mezzanine video card.	**M04**

No Video

Quick Check

Symptom	Quick Check
External display has no video, but activity lights flash at startup, drive operates, fan array is spinning, and power LED is illuminated. • Device has power and boots, but no video output	**1.** Confirm the system configuration supports an external display. Not all configurations do, although the Mini DisplayPort connector on the rear of the unit is present regardless. Using System Profiler you can check the Graphics/Displays section for the presence of a video card. **2.** Reseat the external Mini DisplayPort adapter and cable connections. **3.** If you are using a Mini DisplayPort adapter, inspect the adapter pins and replace the adapter if necessary. **4.** Reset PRAM/NVRAM. **5.** Test with a known good display. **6.** Remove all third party devices. **7.** Run complete AXD Diagnostics.

Deep Dive

Check	Result	Action	Code
1. Press the SMC Reset button on the logic board to reset the SMC. Is the issue resolved?	Yes	Issue resolved.	
	No	Go to Step 2	
2. Check internal diagnostic LEDs. Go to diagnostic LED section for more information. Is the issue resolved?	Yes	Issue resolved.	
	No	Go to Step 3	
3. Reseat the mezzanine video card. Is the issue resolved?	Yes	Issue resolved.	
	No	Replace mezzanine video card. Go to step 4.	**M03**
4. With replacement mezzanine video card is the issue resolved?	Yes	Issue resolved.	
	No	Replace Logic Board.	**M03**

Mechanical Issues: Thermal and Enclosure

Failed or Fast Fans

Quick Check

Symptom	Quick Check
System Fast/Failed Fans • System feels very warm • Computer is sluggish • Fan(s) running fast • Fan(s) not running at all	**1.** Verify the System has adequate airflow around the enclosure, front and rear vents not blocked. **2.** Verify the issue is not user perception - System functions correctly, and not running any warmer than expected. Compare to a similarly configured System. Processes running in the background may go unnoticed by the user. **3.** Understand temperatures and fan speed will fluctuate within a normal range depending on processes running, and attached peripherals. Fan(s) speeds may take several minutes to return to idle after heavy CPU or I/O activity has ceased. **4.** Verify correct specification memory is used. Ensure the installed memory is configured correctly to optimize performance. **5.** If there is abnormal temperature the overall System speed will be noticeably reduced. If the abnormal temperature cannot be reduced to within the normal range a force shutdown will occur. These events are recorded in System.log. Check Xserve logs for any "runaway" applications or processes consuming the CPU's.

Deep Dive

Check	Result	Action	Code
1. Verify if the issue is user perception of intermittent noisy fans. Is the System running as expected (compared to a similar system)?	Yes	No problem found. Inform the customer the system is operating normally.	
	No	Go to step 2.	

2. Determine if there are runaway applications or processes consuming the CPU's - Verify using 'Activity Monitor'. Are any runaway applications or processes present?	Yes	The application or process may have crashed. Alternatively check with the software vendor for compatibility and software update.	
	No	There are no runaway applications or processes. Go to step 3.	
3. Press the SMC Reset button on the logic board to reset the SMC. Verify all fans are rotating at close to minimum speed within a few minutes after the system is idle	Yes	Issue resolved.	
	No	Go to Step 4	
4. Check internal diagnostic LEDs. Go to diagnostic LED section for more information. Verify all fans are rotating at close to minimum speed within a few minutes after the system is idle.	Yes	Issue resolved.	
	No	Go to Step 5	
5. Boot the System from a known good external volume. Verify all fans are rotating at close to minimum speed within a few minutes after the system is idle.	Yes	Suspect issue is caused by customer software or Mac OS X install. Backup all data, restore unit from the Mac OS X install discs and restore from the backup.	
	No	Go to step 6	

6. Clear out any obstructions such as dust or internal cables from the fan array and heatsinks. Reseat fan array connections to drive interconnect backplane. Ensure no damage to heatsinks ie bent or crushed fins. Reseat CPU(s) and heatsink(s). Run Server Monitor and AXD to verify the thermal sensor and fan circuity is functioning correctly. Verify all fans are rotating at close to minimum speed within a few minutes after the system is idle.	Yes	Issue resolved	
	No	Replace affected component based on AXD, internal diagnostic LEDs, and Server Monitor findings: - Fan Array failures - Drive Interconnect Backplane won't drive the known good fan failures - Sensor related failures - For Heatsink failures	**X18** **M18** **M23** **M99**

Apple Technician Guide

Take Apart

Xserve (Early 2009)

General Information

Orientation

For most take-apart procedures, Apple recommends removing the computer from the rack before removing or installing the part.

Tools

The following tools are required to service all configurations of the computer:

- Magnetized Phillips #1 screwdriver
- Magnetized Phillips #2 screwdriver
- Magnetized 3 mm Hex screwdriver
- Xserve Allen wrench key
- Thermal grease kit (Apple part number 076-1225)
- Nylon probe tool (Apple part number 922-5065)
- Alcohol wipes
- Soft cloth (for protecting the enclosure from scratches)

How to Identify Single- and Dual-Processor Configurations

See "How to Identify Single- and Dual-Processor Configurations" in the Basics chapter.

Mounting in a Rack

For information on mounting Xserve (Early 2009) in a rack, see the Xserve (Early 2009) Setup Guide.

Icon Legend

The following icons are used in this chapter:

Icon	Meaning
	Warning or caution
	Check; make sure you do this
	Challenging procedure; requires more thought and/or time until you are familiar with it

Note on Illustrations

Because a pre-production model was used for the illustrations in this manual, you may notice small differences between the image pictured and the computer you are servicing.

Apple Drive Module

First Steps

Caution: Make sure data is backed up before removing or replacing the drive.

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Tools

- Xserve Allen wrench key

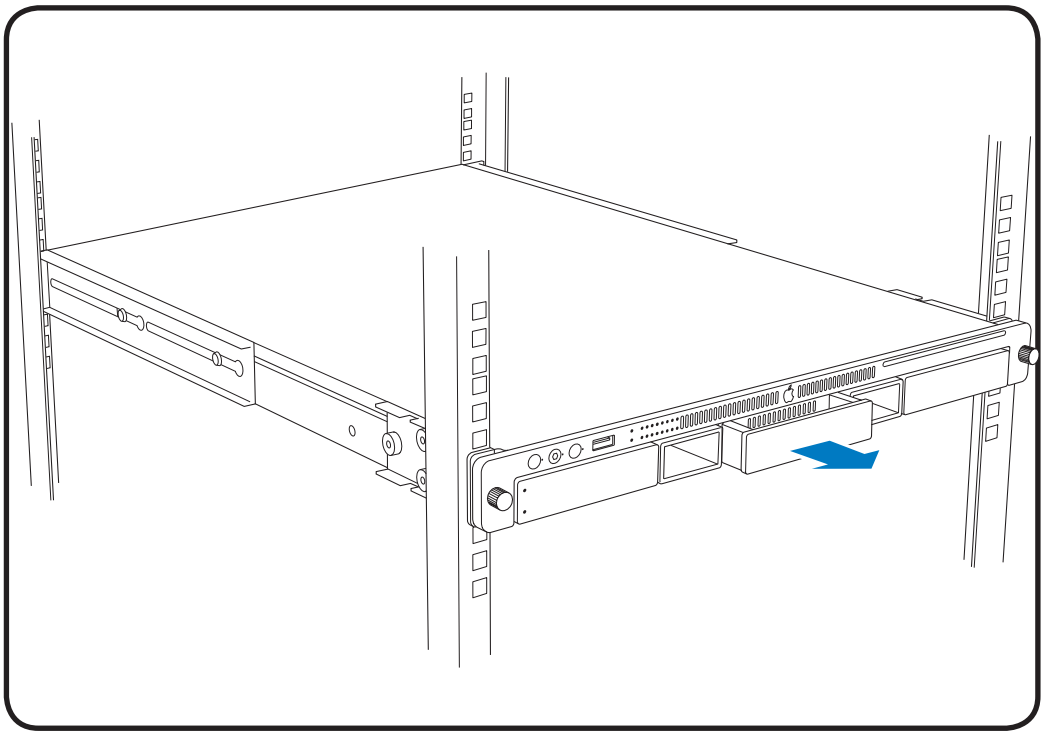
Removal

1 Make sure the locking mechanism is in the unlocked position.

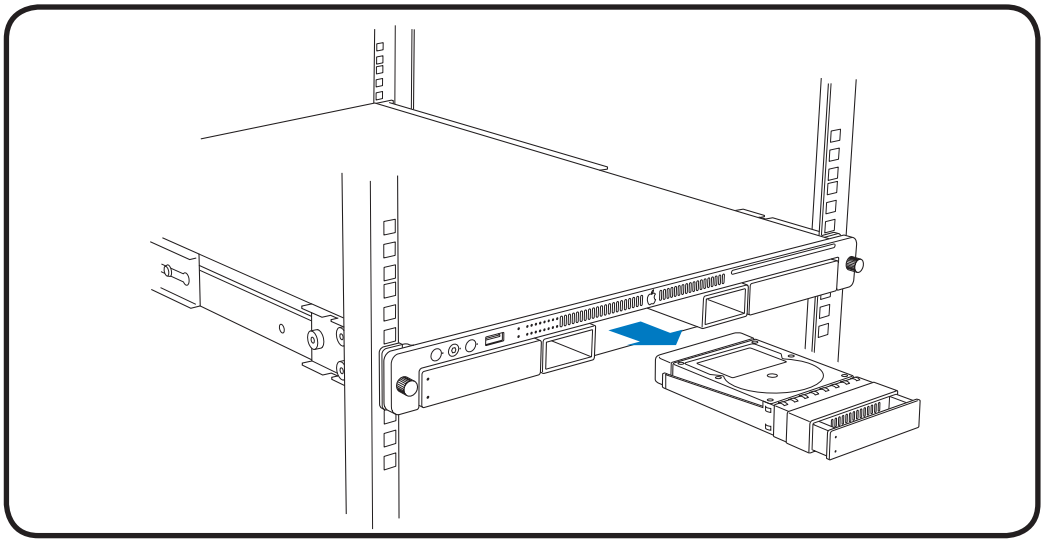
2 Make sure the drive being replaced is not in use by any application and is not being shared by the Xserve. (See the Mac OS X Server documentation for information about shared drives.)

3 Unmount the drive (by using the command-line tools or by dragging the volume icon to the Trash.).

4 Press the handle on the drive. Wait for the upper LED to turn off

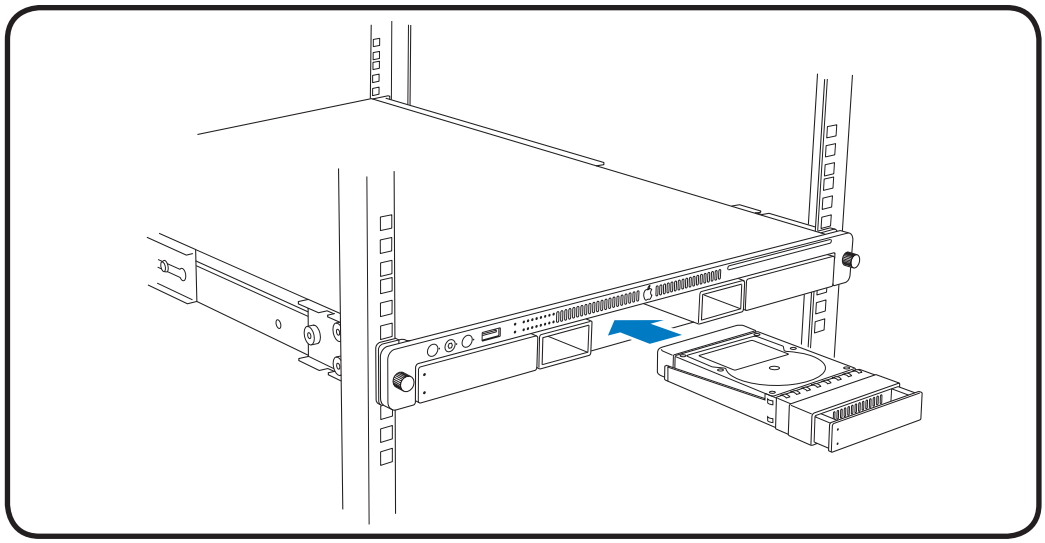


5 Grasp handle on the replacement drive. Pull module out of the Xserve.



Replacement

1 Slide module into the bay until it is firmly seated.



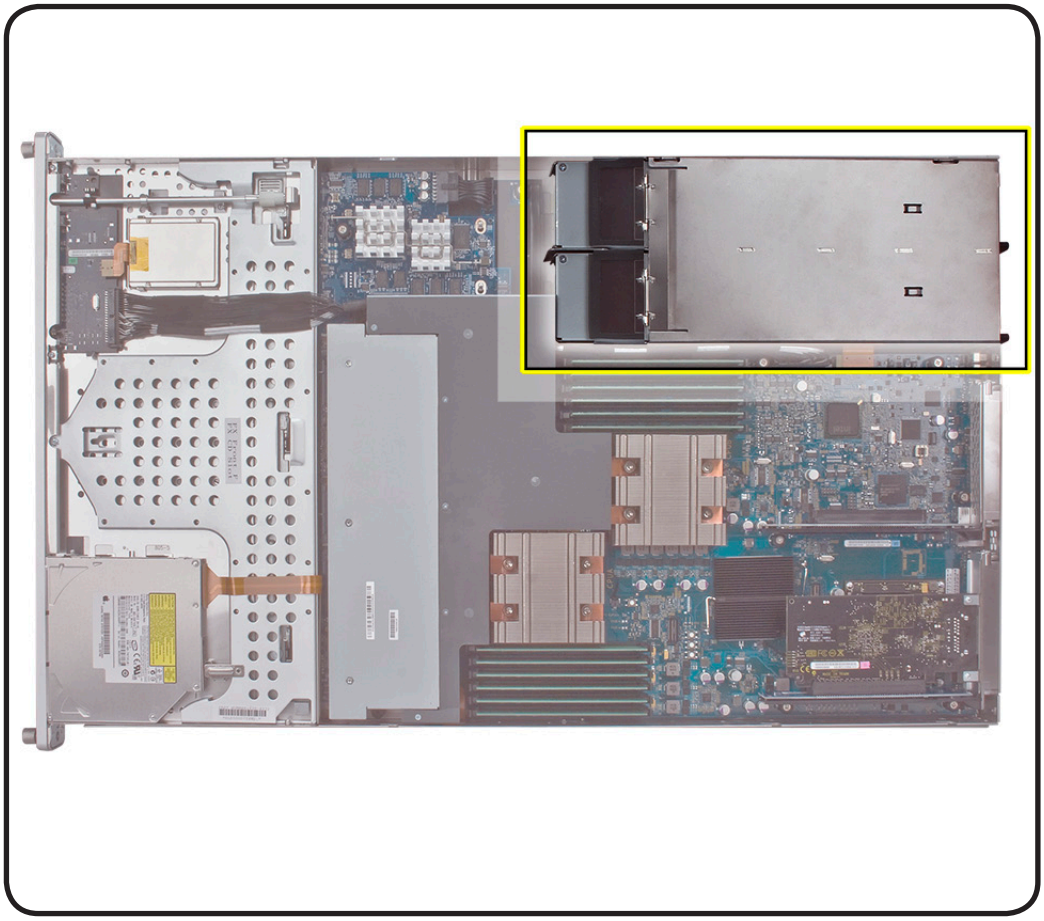
2 Press the handle flush with the front panel.

Replacement Note: If you replace the hard drive with a new one, format the new drive.

Power Supply

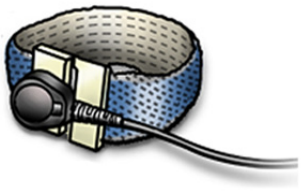
First Steps

Warning: If the Xserve has only one power supply, shutdown computer.



Tools

- ESD wrist strap

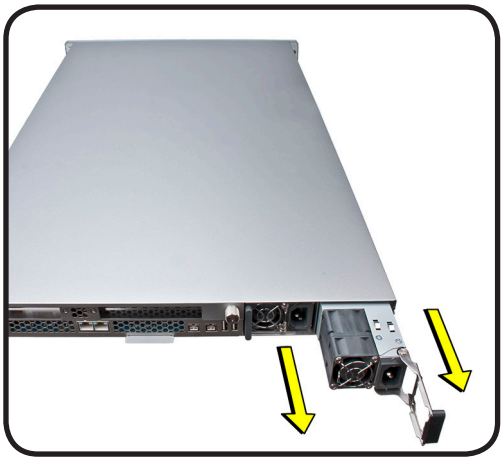


Removal

1 Unplug the power cord from the power supply.

2 Pull handle to release the power supply.

3 Slide out of the bay.



Note: If the Xserve is already running on a second power supply, the status light on the new power supply turns green to indicate normal operation as it stars sharing the load. If the Xserve is not turned on, the status light blinks green when the power cord is plugged in to an outlet with power.

Replacement

1 Pull handle on the new power supply.

2 Slide the power supply all the way into bay.

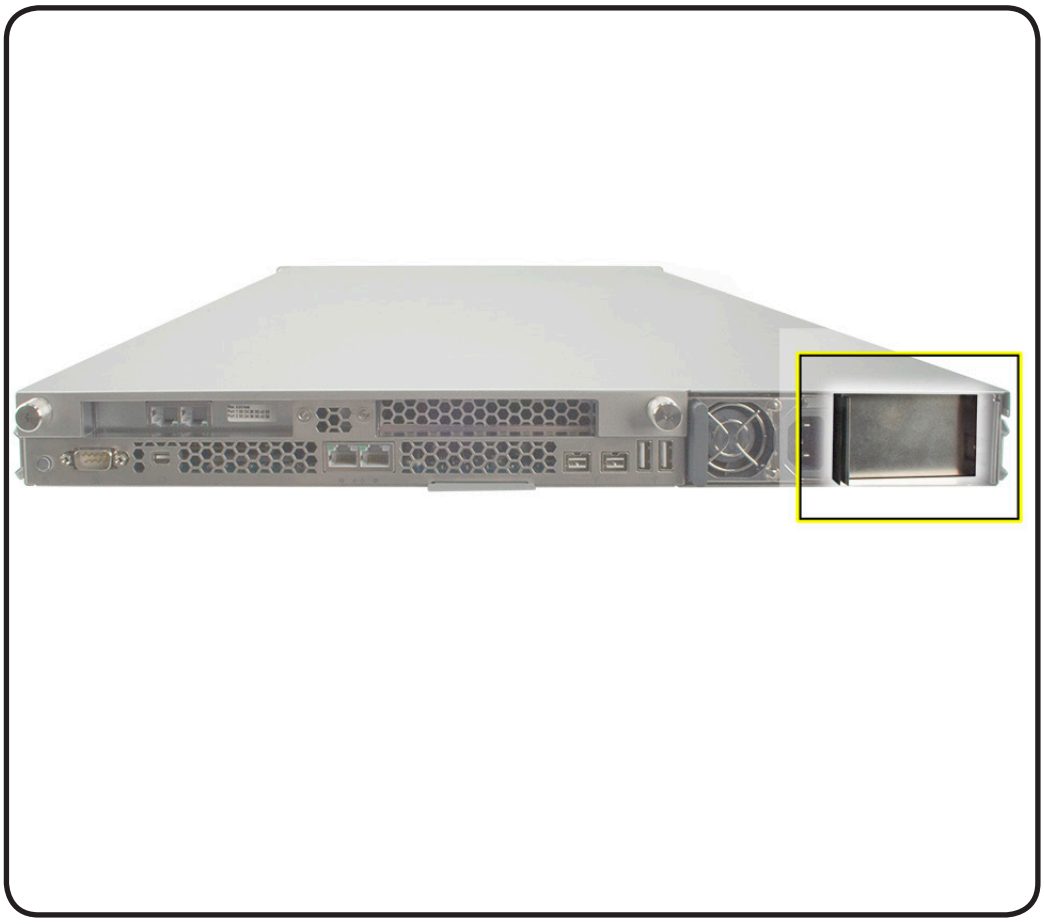
3 Press handle to seat properly and lock it in place.

4 Connect power cord to power supply.

Power Supply Blank

First Steps

- No first steps for this procedure.

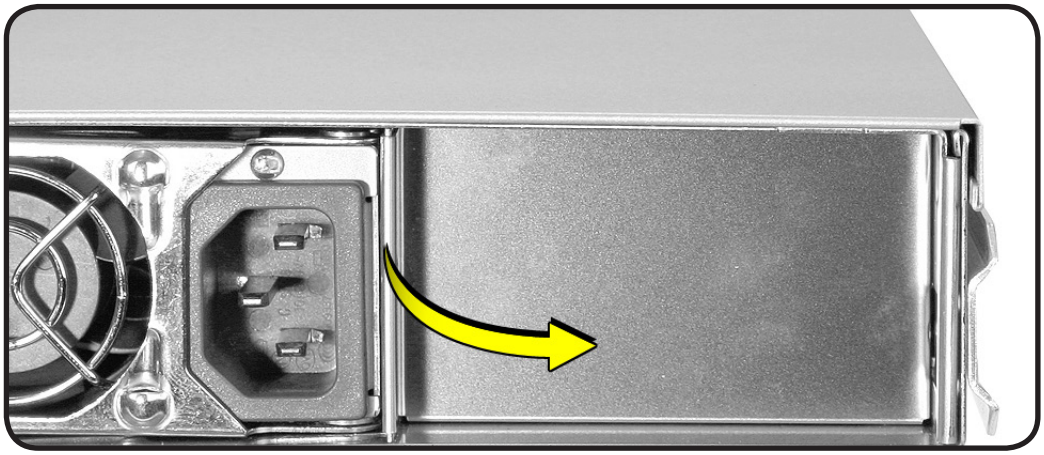


Tools

- No tools required

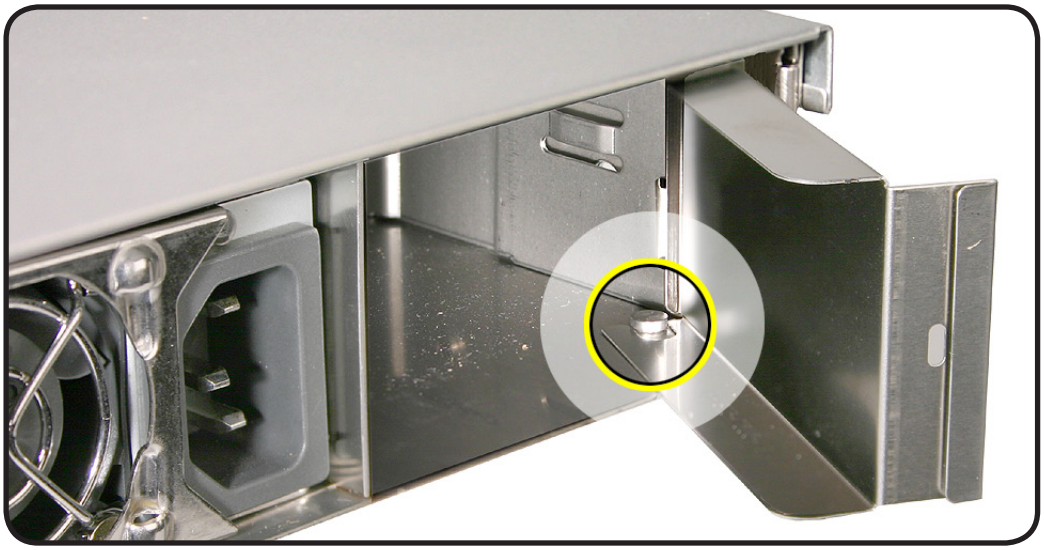
Removal

1 Pull the handle to swing open the power supply blank.



2 Notice the hook that catches on the inside bottom of the power supply bay.

3 Open the power supply blank as far as it will go, and pull out the power supply blank.



Replacement

1 Align the hook on the power supply blank with the catch inside the power supply bay.

2 Close the power supply blank and press handle over the bay wall to lock it in place

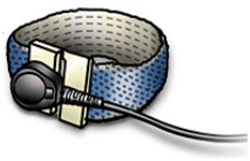
Top Cover

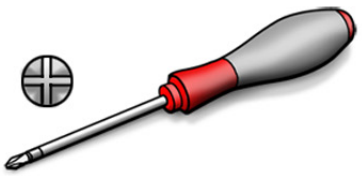
First Steps

Write down the Xserve serial number. If the Xserve's software must be setup after service is complete, the serial number will be required.

Tools

- ESD wrist strap
- Xserve Allen wrench key
- Phillips #1 screwdriver (optional)





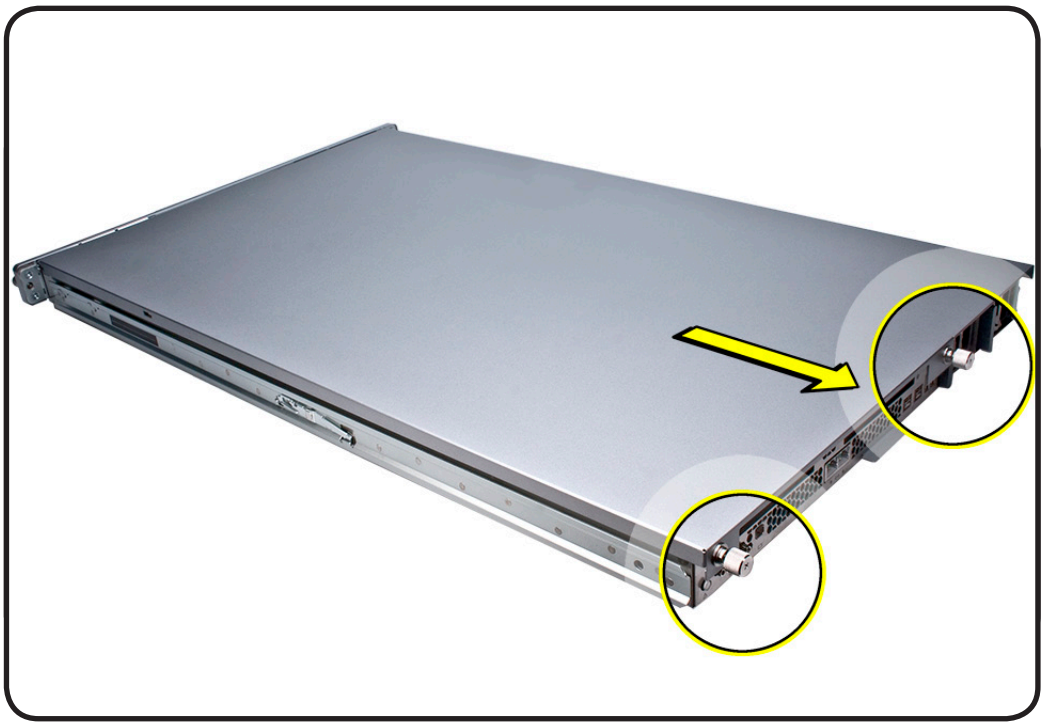
Removal

1 Shutdown the Xserve and wait a few moments for components to cool.

2 If the Xserve case is locked, use the Xserve Allen wrench to unlock the security lock on the front panel.

3 Unplug all cables from the Xserve..

4 Loosen the thumbscrews at the back of the top cover and slide cover back and up to remove it.



Replace

1 Replace and secure the cover.

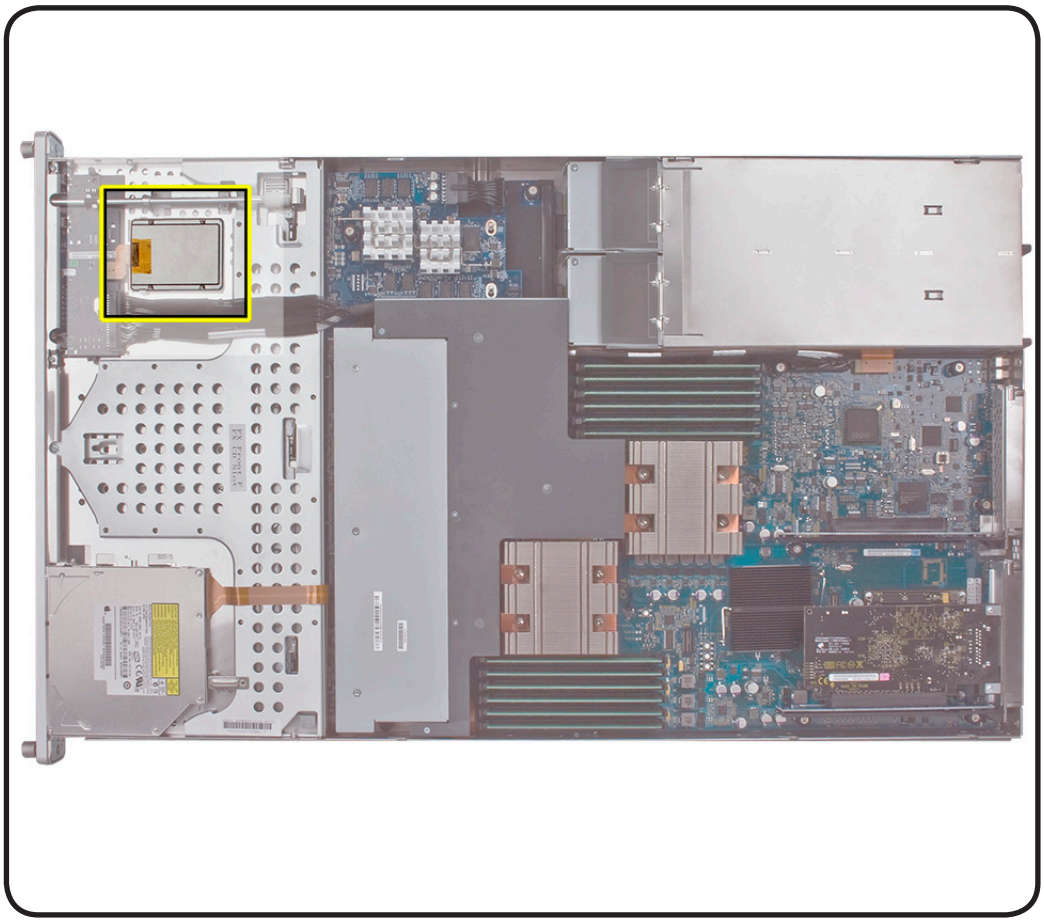
2 Tighten the thumbscrews at the back of the top cover.

Solid State Drive

First Steps

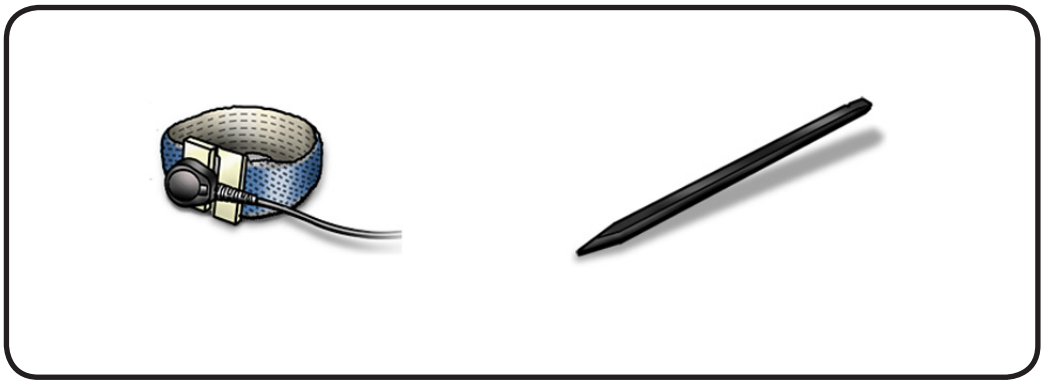
Remove:

- Top Cover



Tools

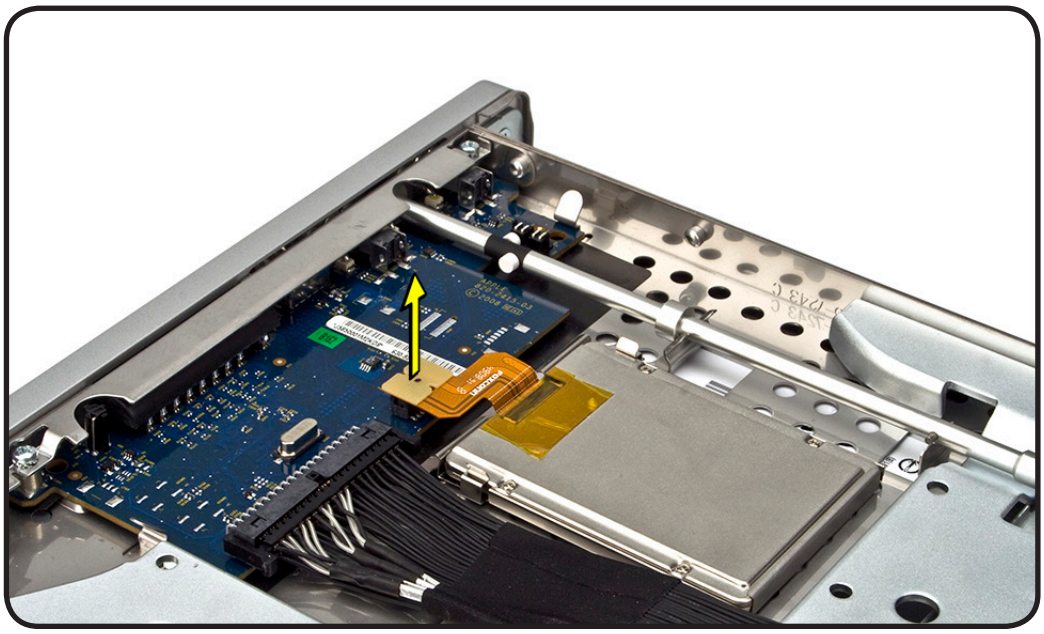
- ESD wrist strap and mat
- Black stick

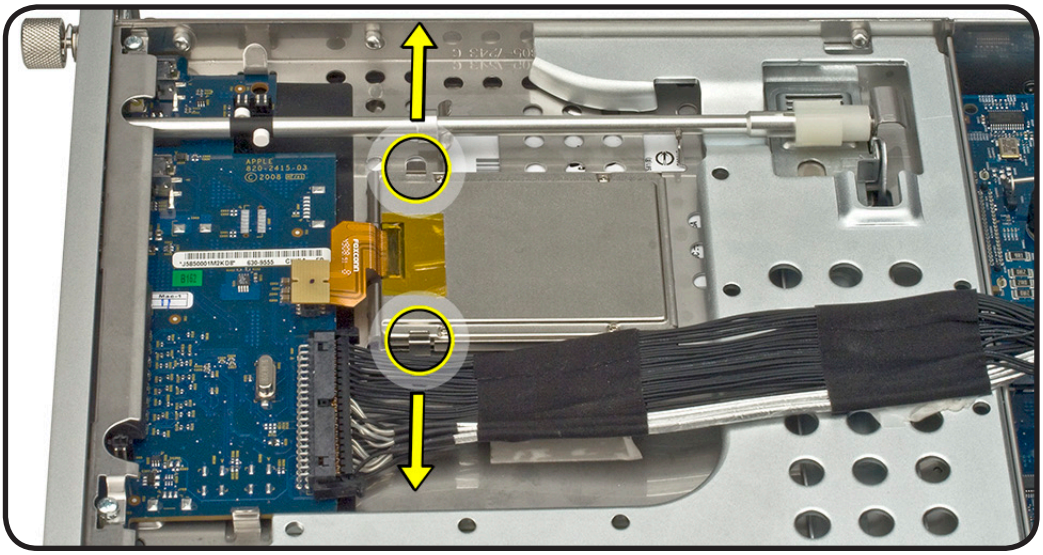


Removal

1 Disconnect the SSD cable from the Front Panel Board.

2 Gently press the two tabs out to release the drive. It may be helpful to use the black stick under the drive.





Replacement

1 Note the orientation of the drive. The connector on the drive should be facing up. The label should face down.

2 The drive connector should be facing the front of the Xserve.

3 Place the SSD drive into the SSD drive carrier.

4 Connect the SSD cable to the front panel board.

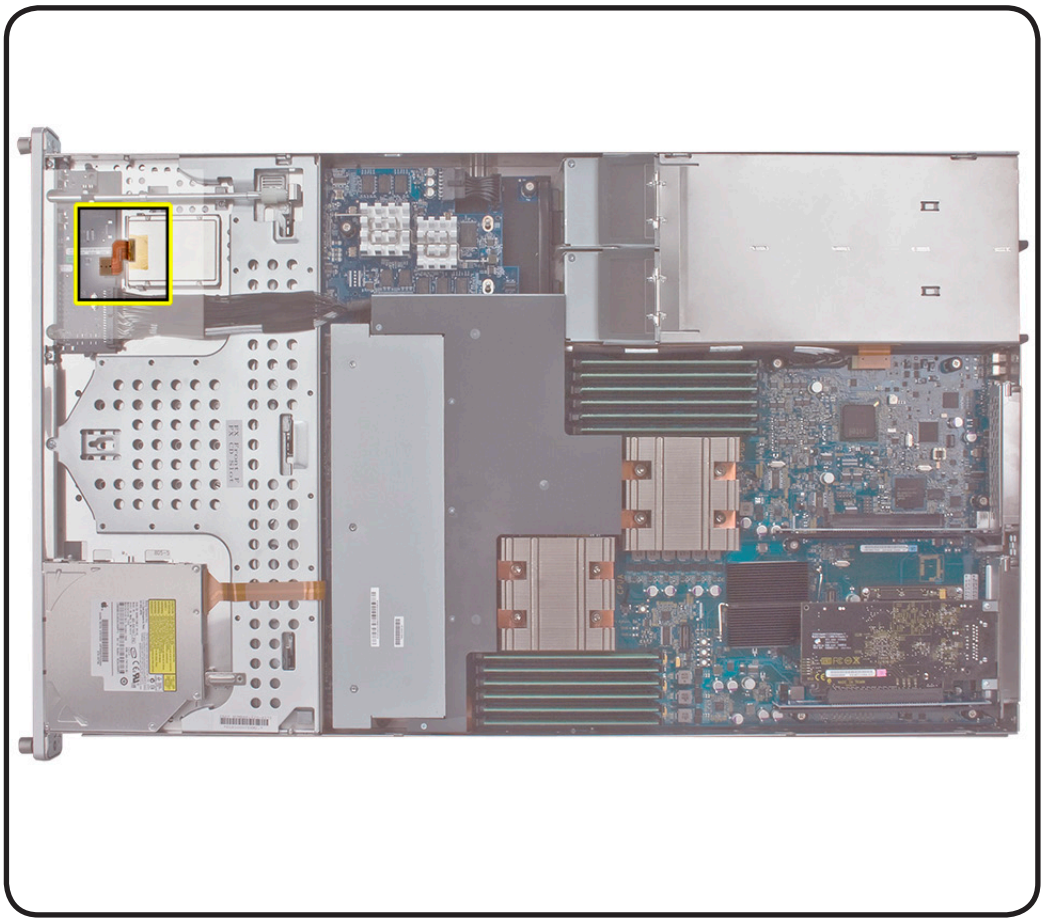
Solid State Drive Cable

First Steps

Remove:

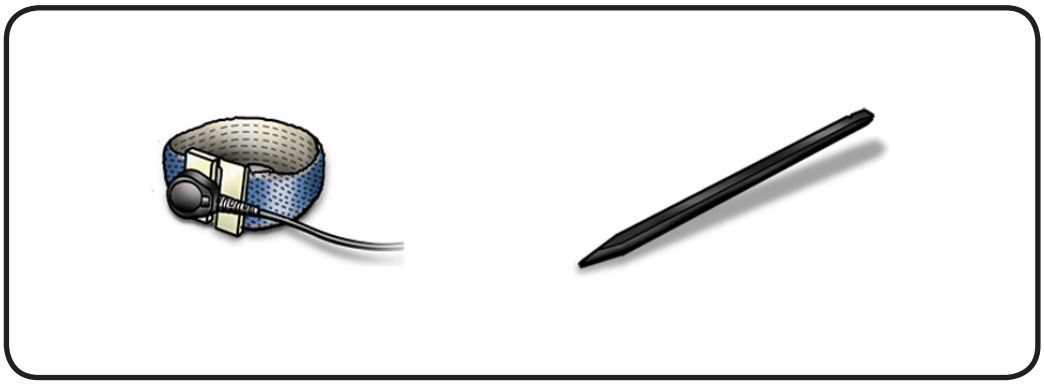
- Top Cover
- Solid State Drive

.



Tools

- ESD wrist strap
- Black stick



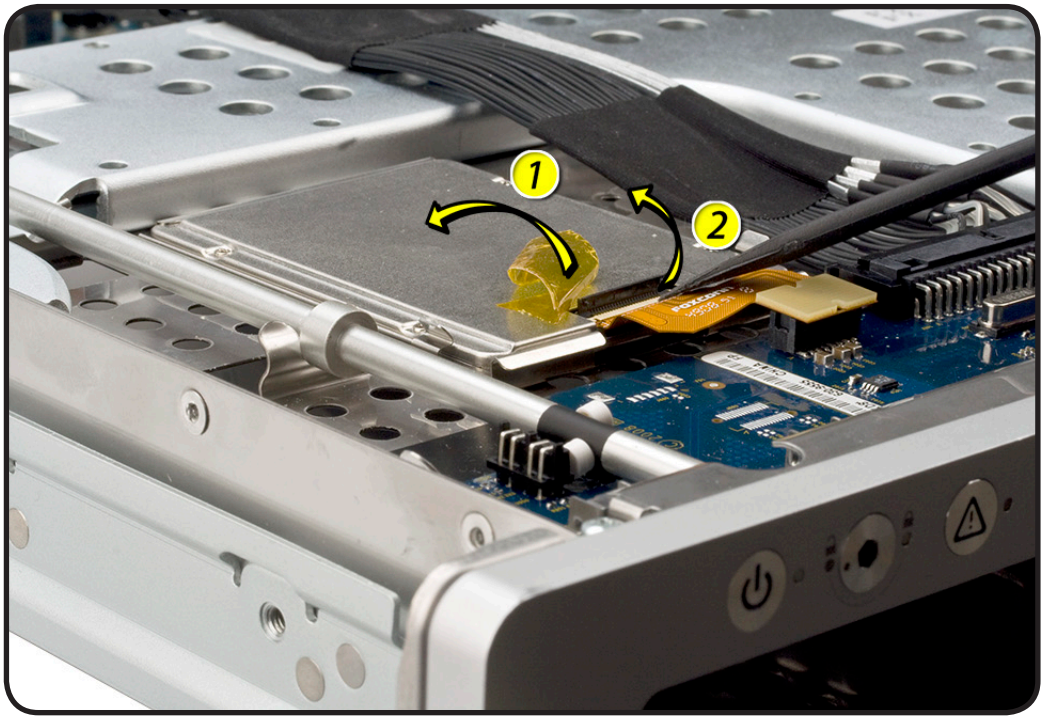
Removal

1 Disconnect Solid-State Drive cable from the Front Panel Board.

2 Lift the Kapton tape from the Solid-State Drive.

3 Using the black stick, gently flip up the locking lever.

4 Gently slide the Solid-State Drive cable out of connector.



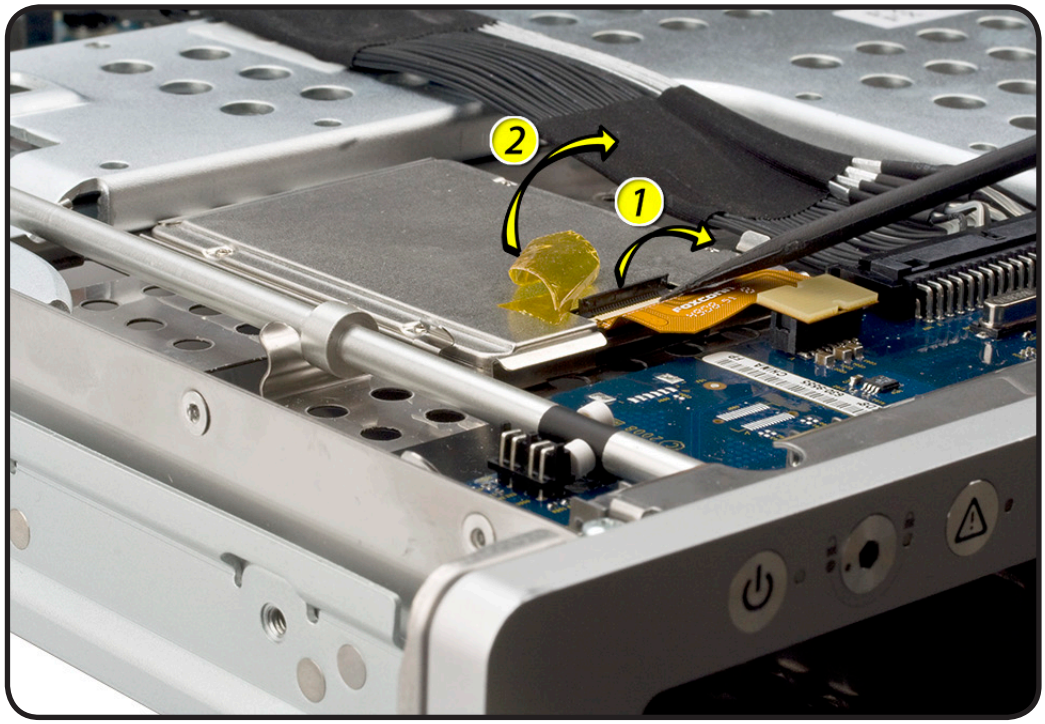
Replacement

1 Slide connector into receptacle on the Solid-State Drive.

2 Lock down lever after inserting cable.

3 Replace Kapton tape over the connector on drive.

4 Connect the cable to the Front Panel Board.



Solid State Drive Carrier

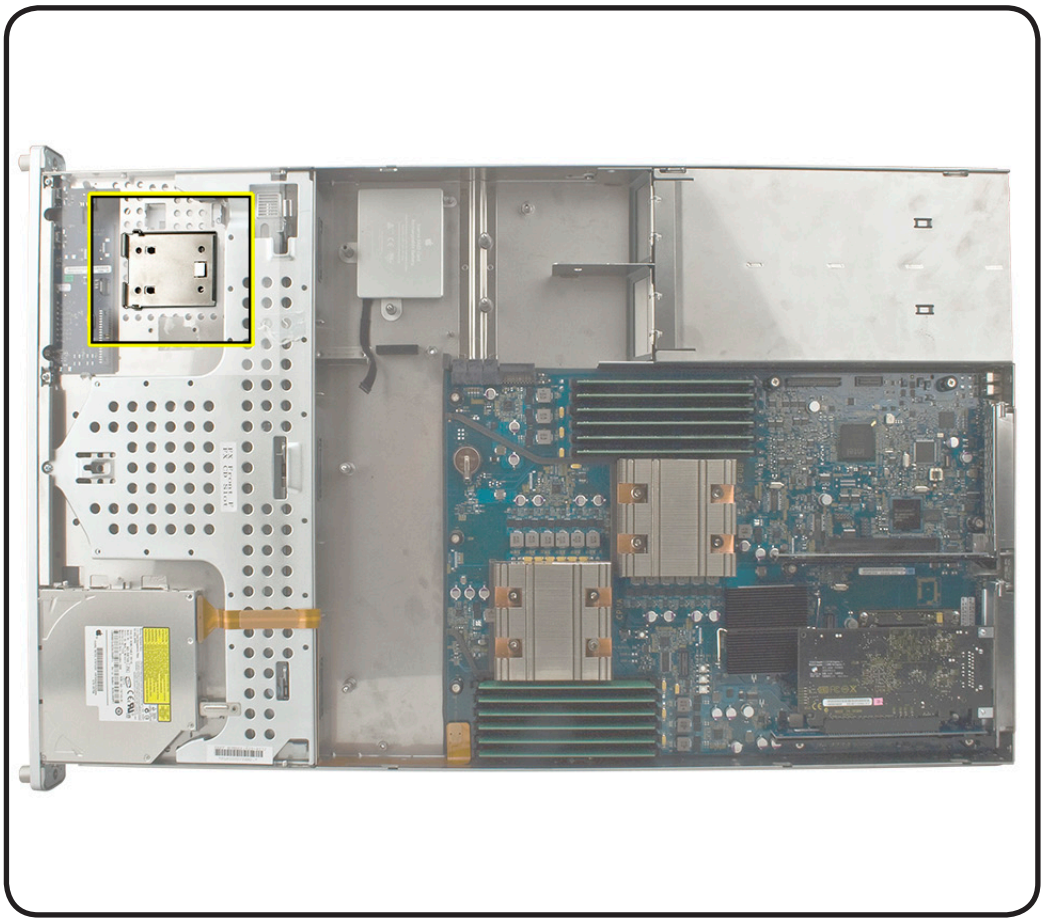
Note: Adhesive on the bottom side of the solid state drive carrier attaches it to the enclosure. Whenever you detach the carrier from the enclosure, you must install a replacement carrier (part number 922-8959). Otherwise, the used adhesive may not hold the carrier firmly in place.

First Steps

Remove:

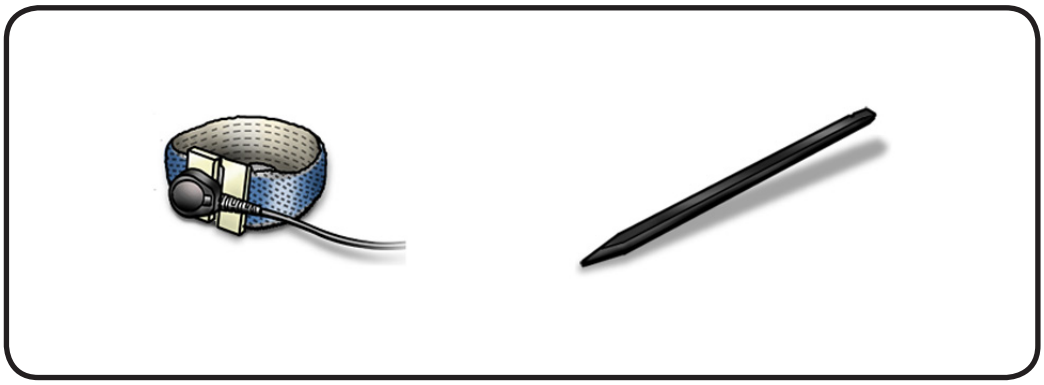
- Top Cover
- Solid State Drive

.



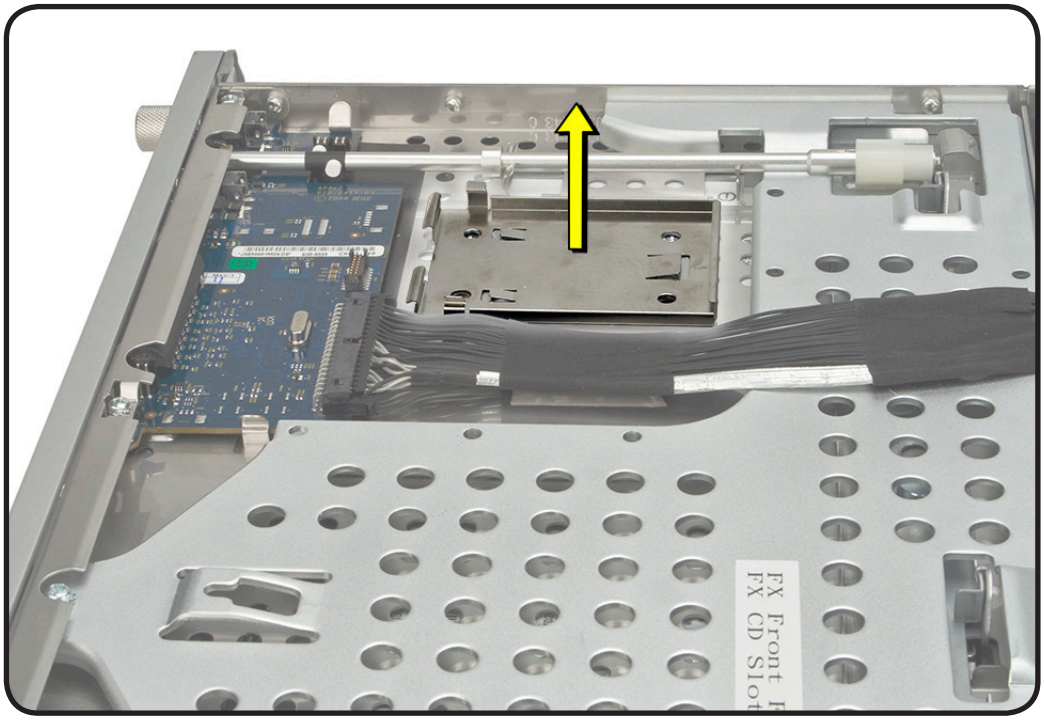
Tools

- ESD wrist strap
- Black stick



Removal

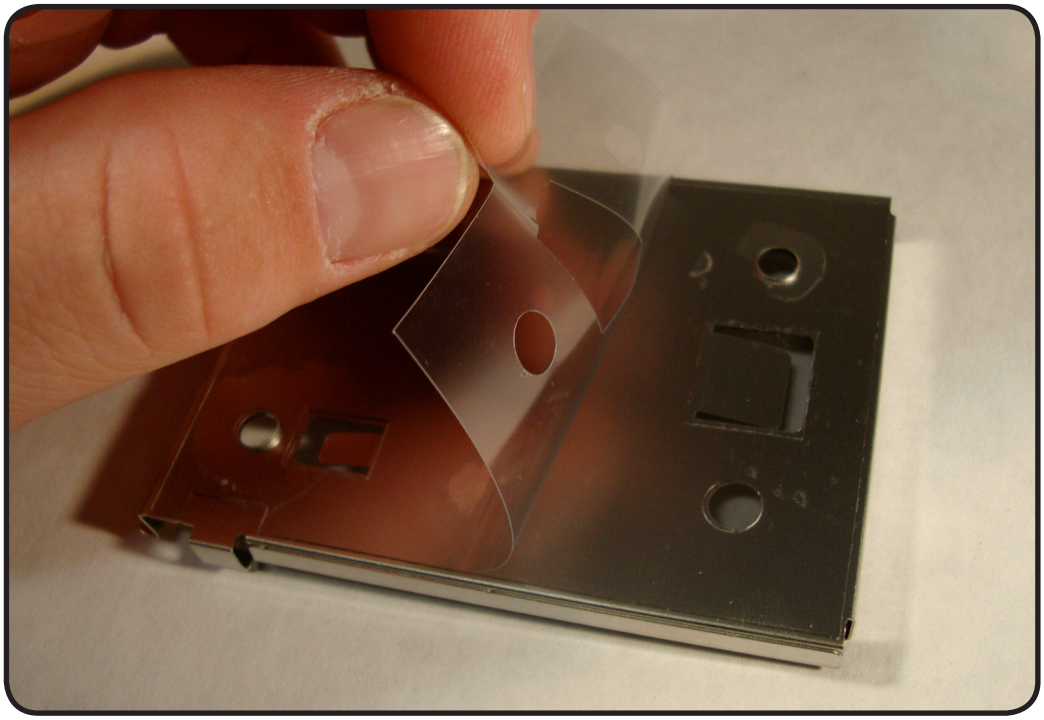
1 Gently lift the carrier from the adhesive on the enclosure.



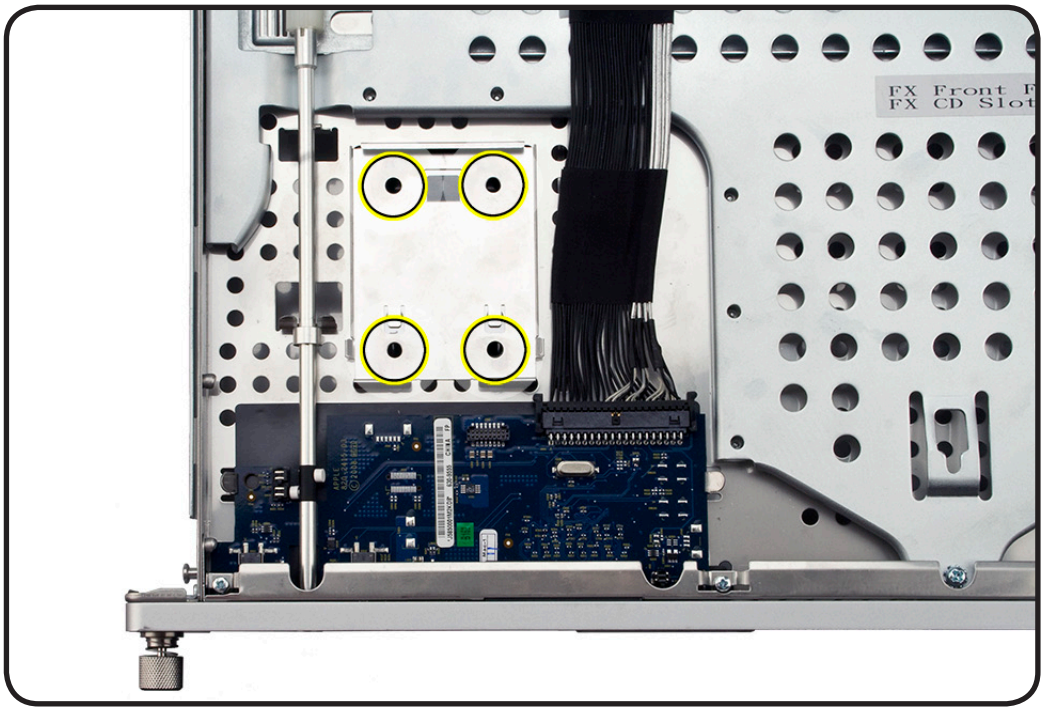
Replacement

Note: The adhesive on the replacement carrier is located on the bottom of the carrier and covered by a protective film.

1 Peel off the film covering the carrier's adhesive.



2 Position the carrier adhesive side down. Align the holes in the carrier with the four enclosure holes indicated and press down.



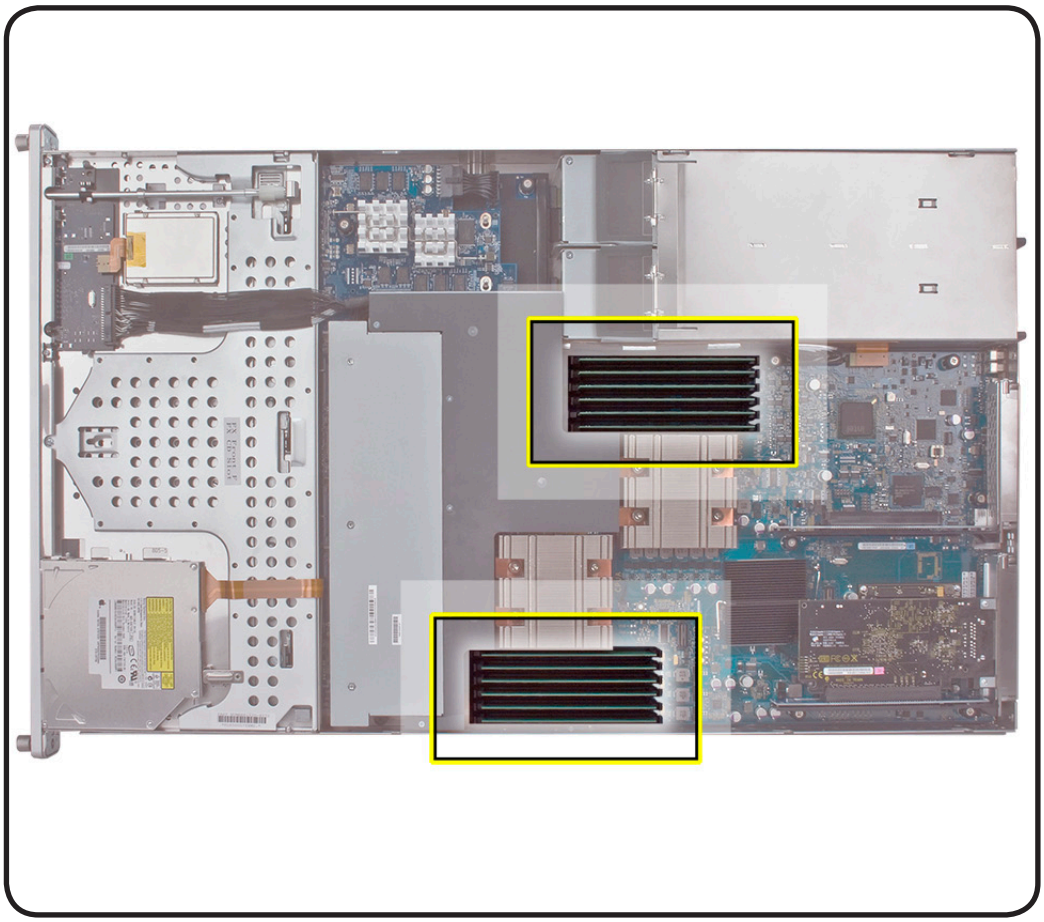
Memory

First Steps

Remove:

- Top Cover

Apple recommends that you use Apple-approved DIMMs. DIMMs from older Xserve systems are not compatible with this Xserve.



Tools

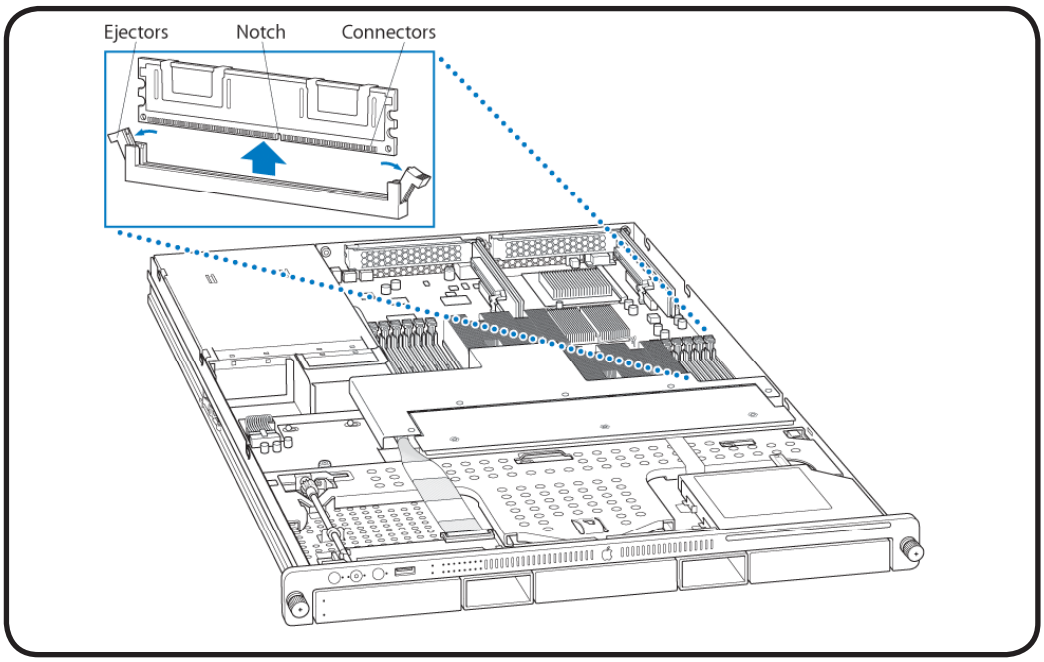
- ESD wrist strap and mat

Removal

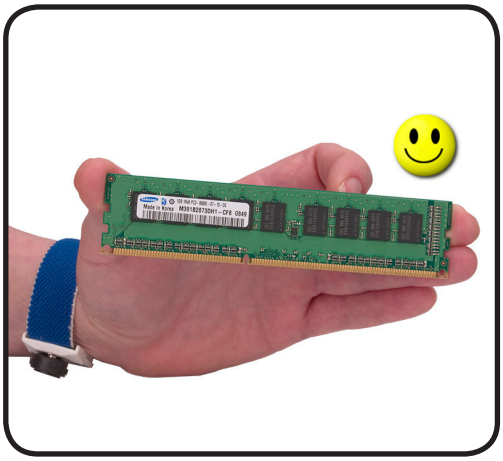
1 Open ejectors on DIMM slots.by pushing them out to the sides.

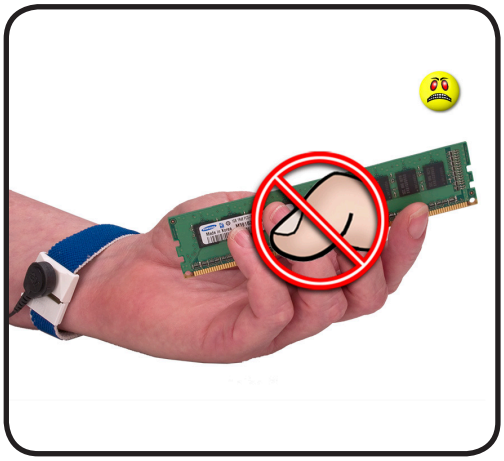
2 Holding the DIMM by edges, remove it from connector.

3 Do not touch the gold connectors.



Warning: DIMMs may be very hot. Always wait 5-10 minutes for computer to cool down .before removing or installing memory





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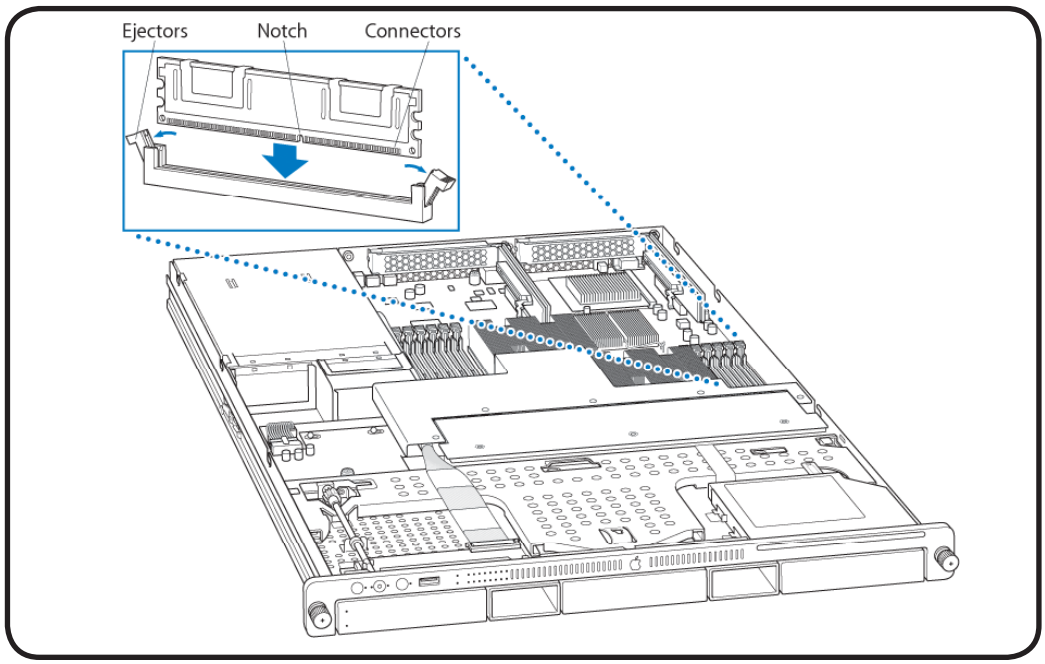
Memory Slot Utility

If the DIMM configuration you install does not provide optimized performance, the Memory Slot Utility will appear on screen and recommend an improved configuration. To use the Memory Slot Utility, go to /System/Library/Core Services.

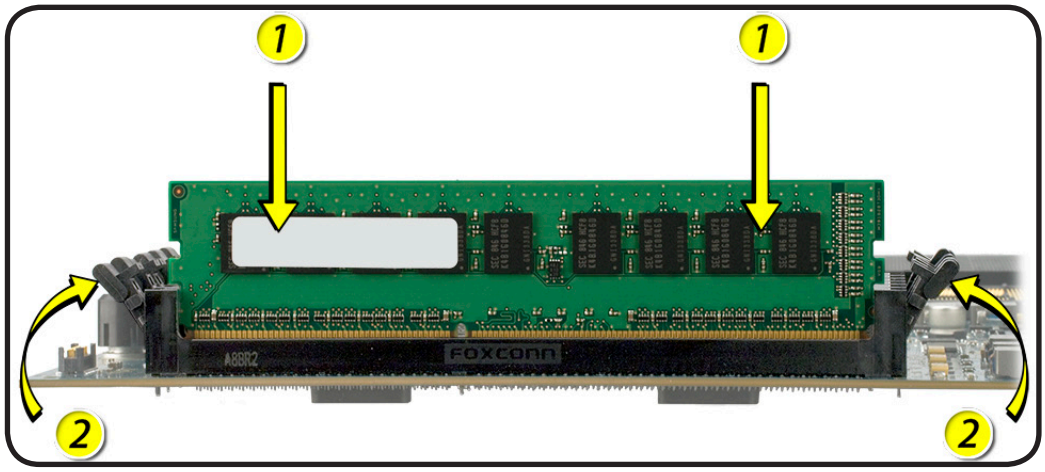
Replacement

Replacement Note: The DIMM is designed to fit into the slot only one way. Be sure to align the notch on the DIMM with the slot.



1 Align.the notch on the DIMM with the slot.

2 Push both ends of DIMM down until ejectors snap back up into place.



Memory Configuration

Xserve (Early 2009) comes with a minimum of 3 GB of memory installed as three 1 GB unbuffered dual inline memory module (UDIMMs).

DIMMs must fit these specifications:

- PC3-8500 1066MHz, DDR SDRAM UDIMMs
- Error-correcting code (ECC)

For proper operation of Xserve computers, Apple recommends using only Apple-approved DIMMs. Refer to GSX for Apple DIMM service part nubmers. Memory from older Xserve computers is not compatible with Xserve (Early 2009).

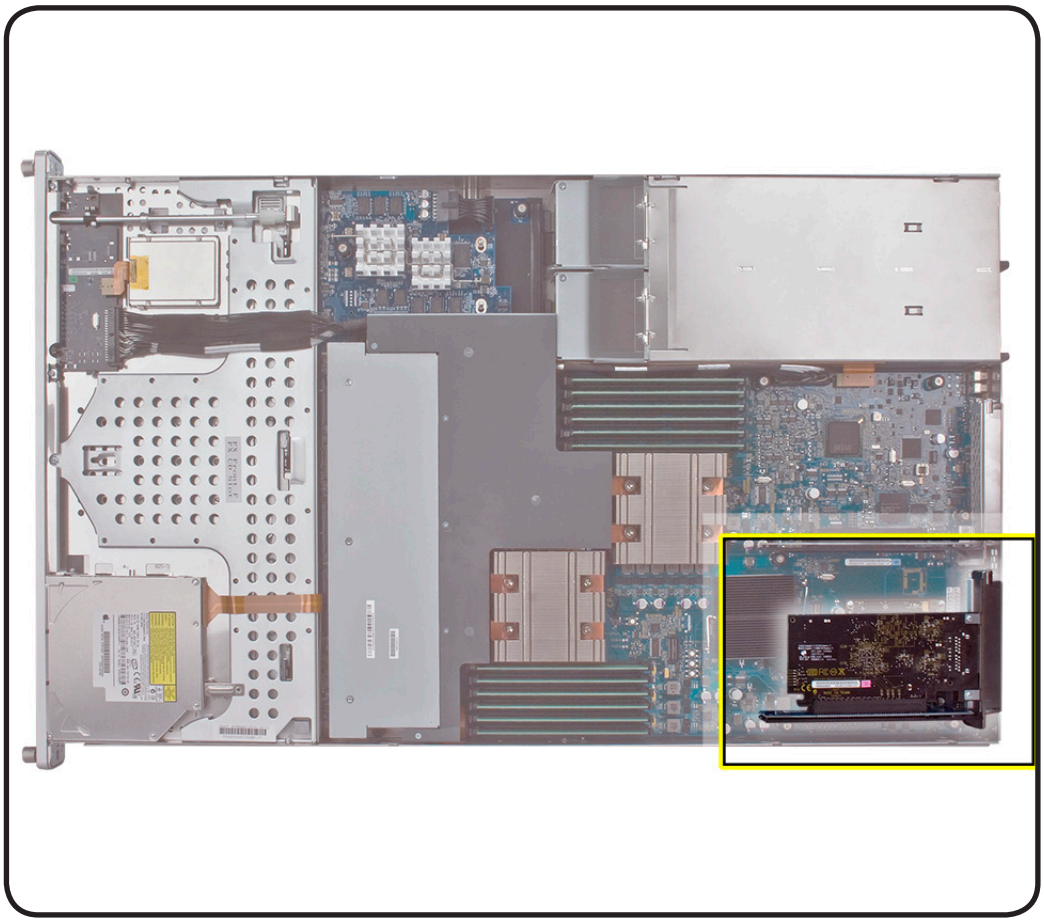
PCI-E Riser Cards

First Steps

Remove:

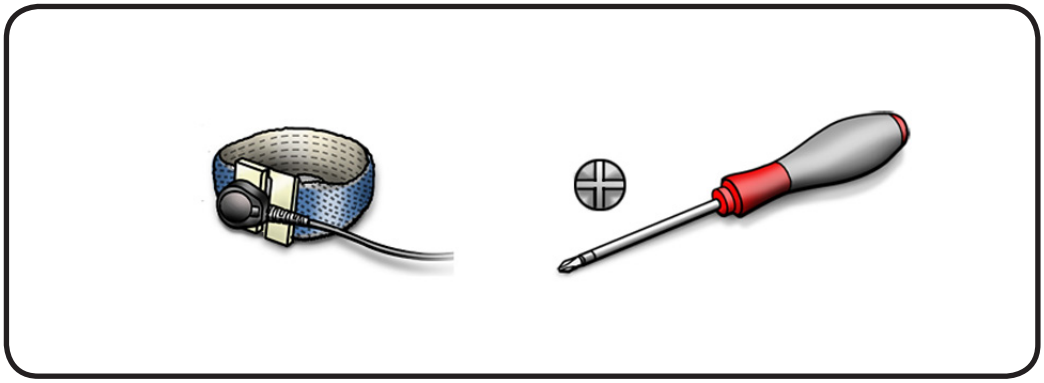
- Top Cover

Important: Before you begin this procedure, verify the Xserve is turned off and unplugged.



Tools

- ESD wrist strap and mat
- Phillips #1 screwdriver



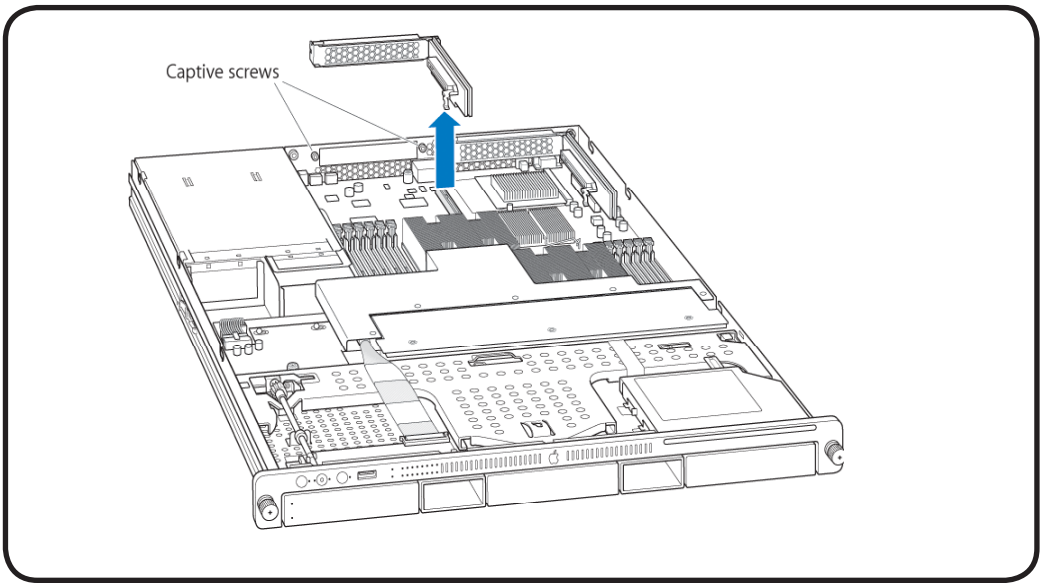
Removal

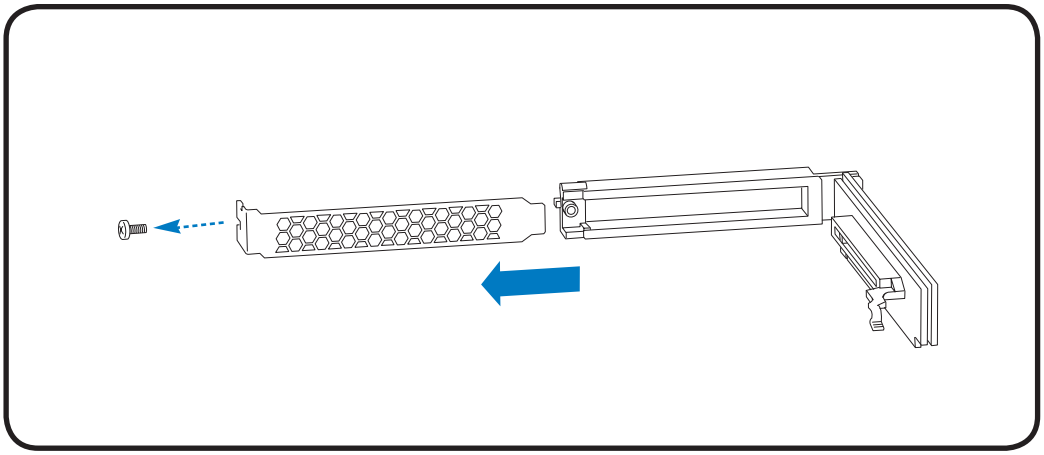
1 Loosen the two captive screws that secure the riser bracket to the back panel.

2 Carefully pull up on the bracket and riser to disconnect from the logic board.

3 If you are removing a blank riser card to install a card do the following:

- Remove the screw on the riser bracket
- Seat the PCI card in the riser slot and replace the screw to secure in the riser.

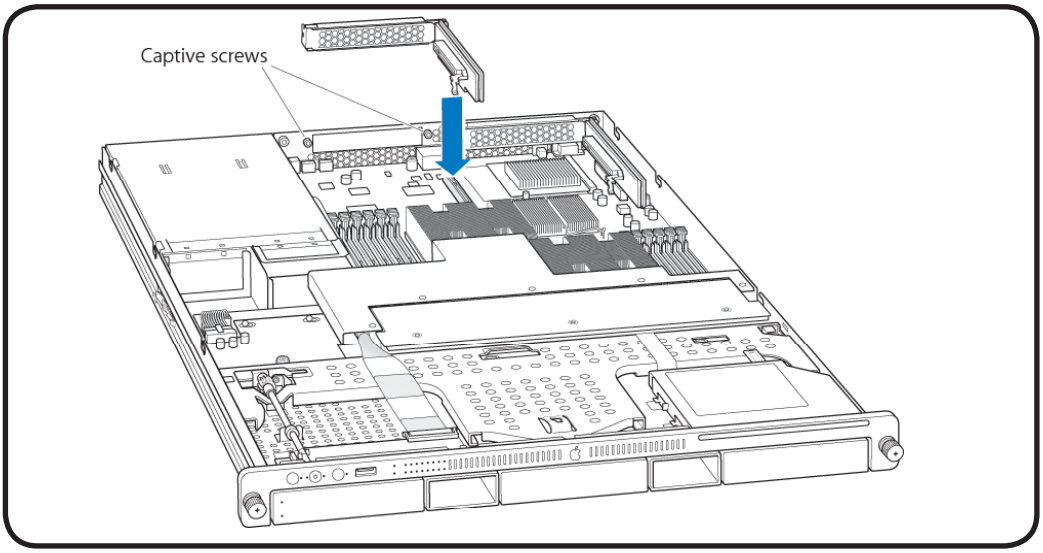




Replacement

If you are replacing an existing riser card do the following:

- Remove any existing expansion card from the riser
- Transfer the card to the replacement riser.



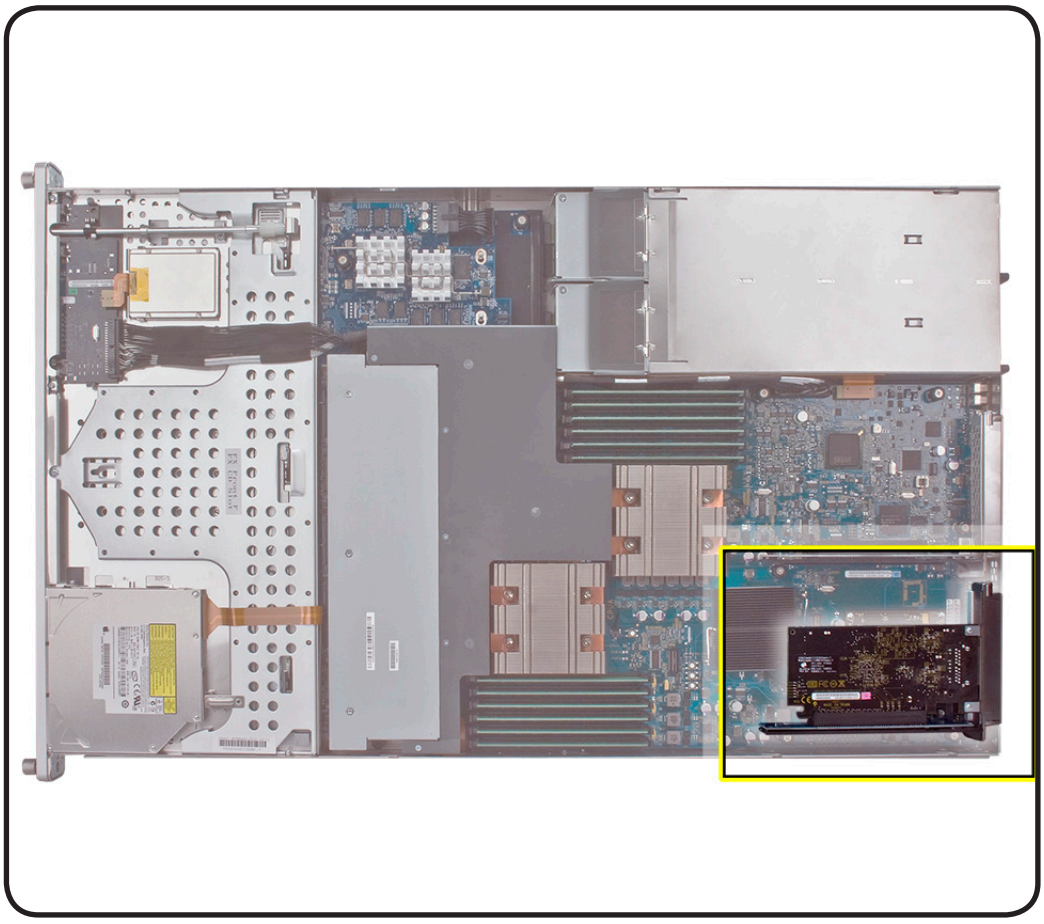
PCI-E Expansion Cards

First Steps

Remove:

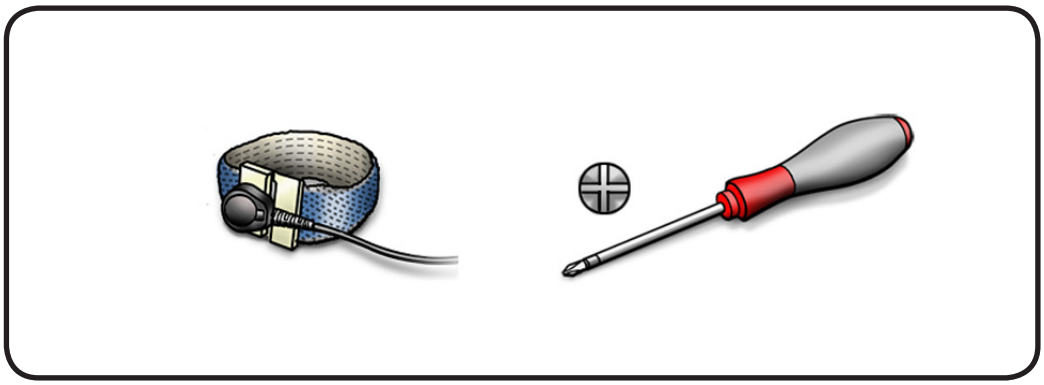
- Top Cover
- PCI-E Riser Cards

Important: Before you begin this procedure, verify the Xserve is turned off and unplugged.



Tools

- ESD wrist strap and mat
- Phillips #1 screwdriver



Removal

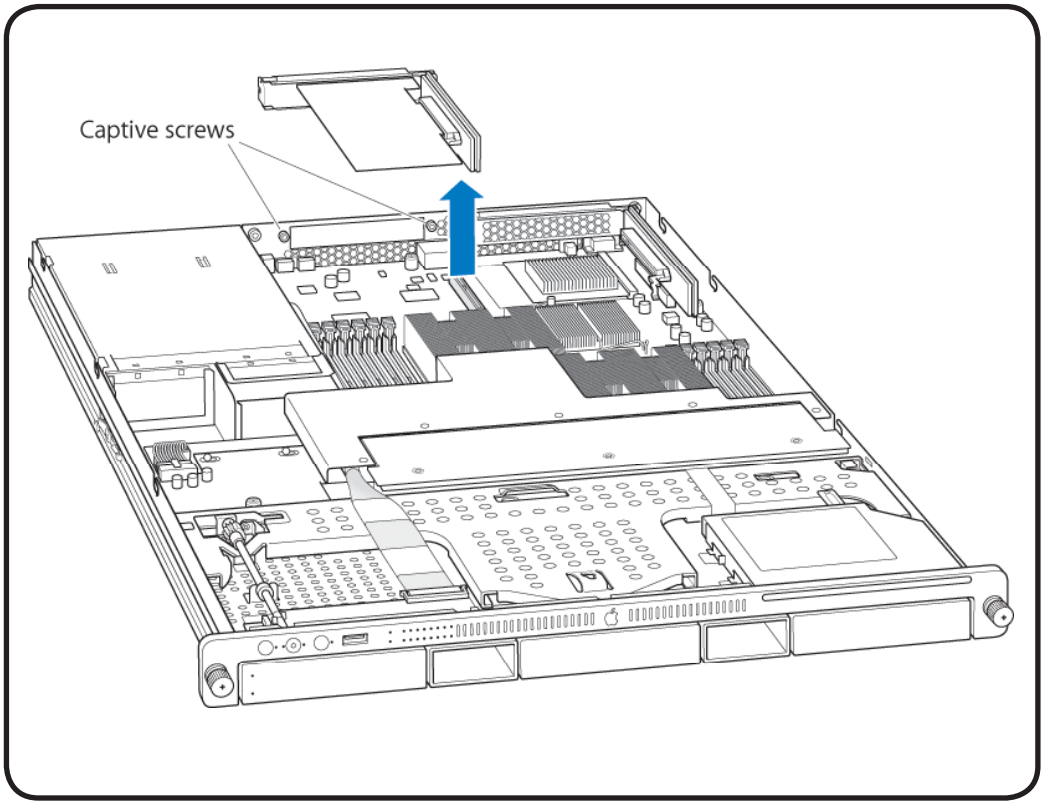
1 Loosen the two captive screws that secure the riser bracket to the back panel.

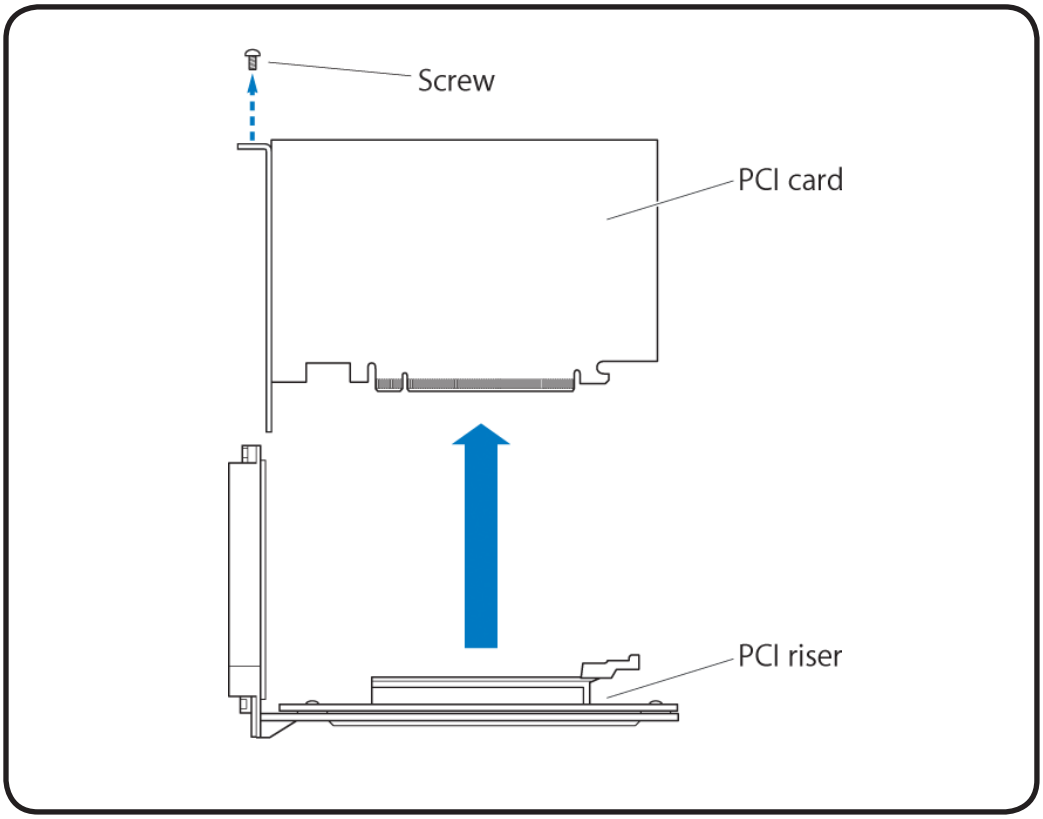
2 Carefully pull up on the bracket and riser., with the expansion card still attached to disconnect from the logic board.

3 Tilt the expansion card up so the port clears the enclosure, and remove the card from the Xserve.

4 Remove the screw that secures the expansion card to the riser.

5 Gently separate the card and riser.



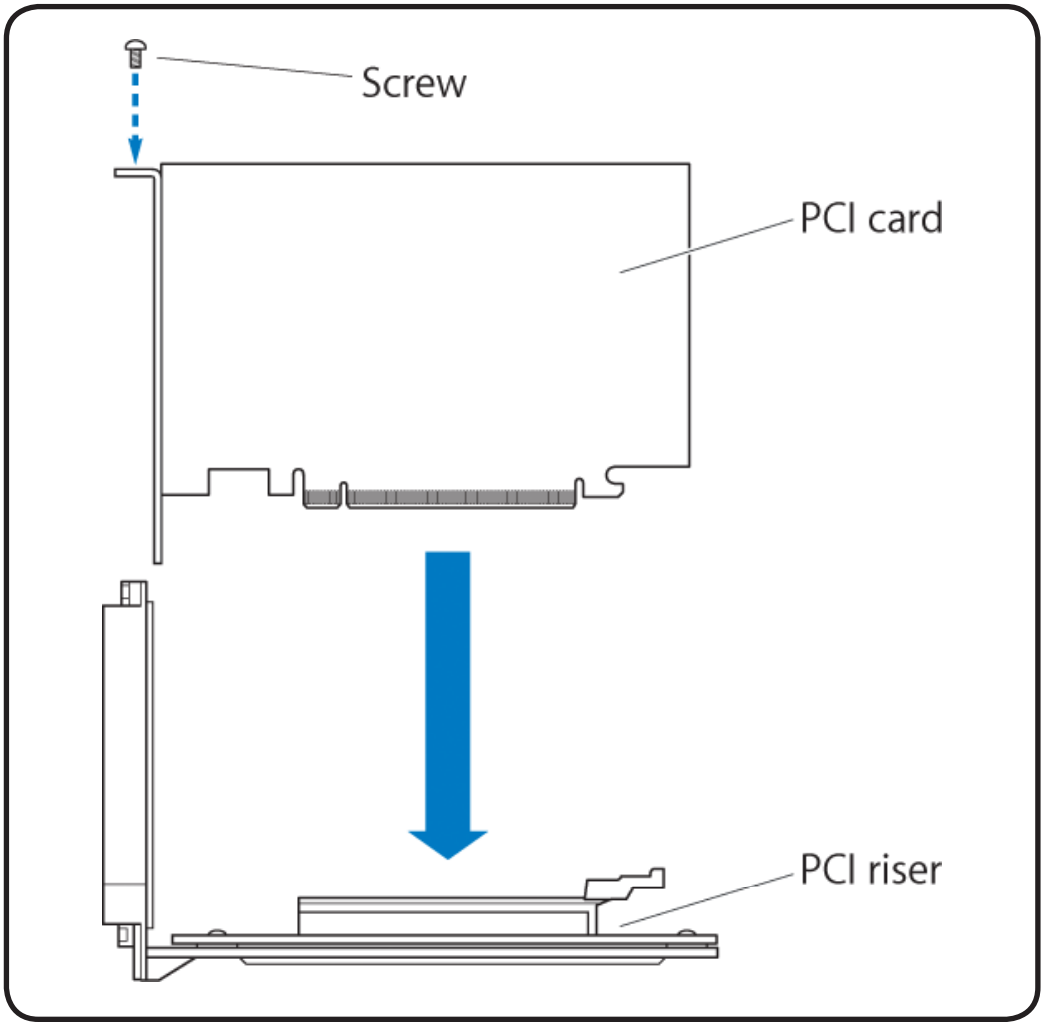


Warning: When removing or installing an expansion card, handle it by the edges. Do not touch its connectors or any components on the card. Do not rock the card from side to side or force the card into the slot.

Replacement

1 Seat the expansion card in the riser slot.

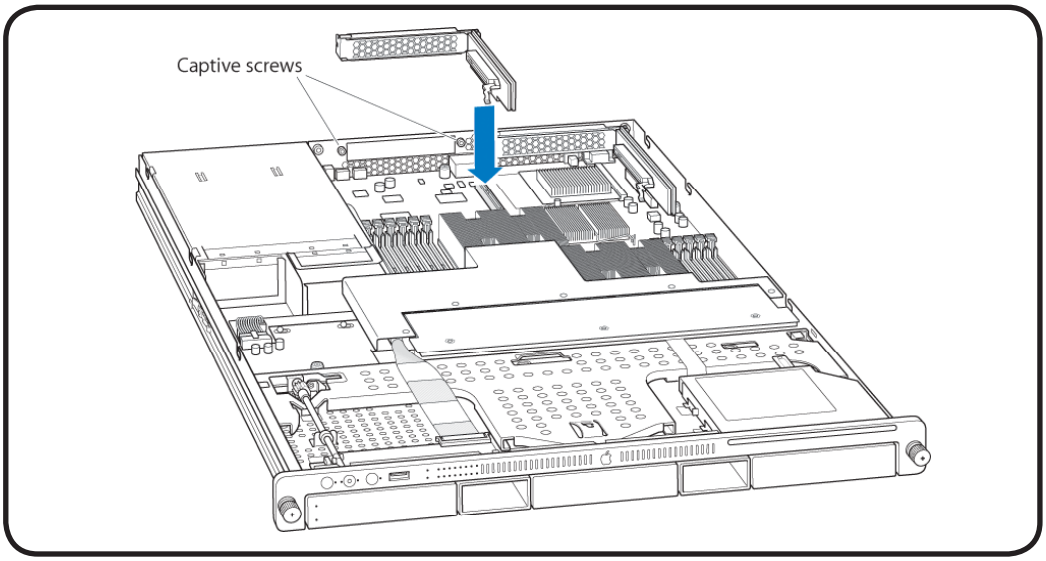
2 Replace the screw to secure the card in the riser.



3 Align the riser with the slot on the logic board.

4 Press down to seat the card.

5 Tighten the captive screws to secure the riser bracket to the back panel.

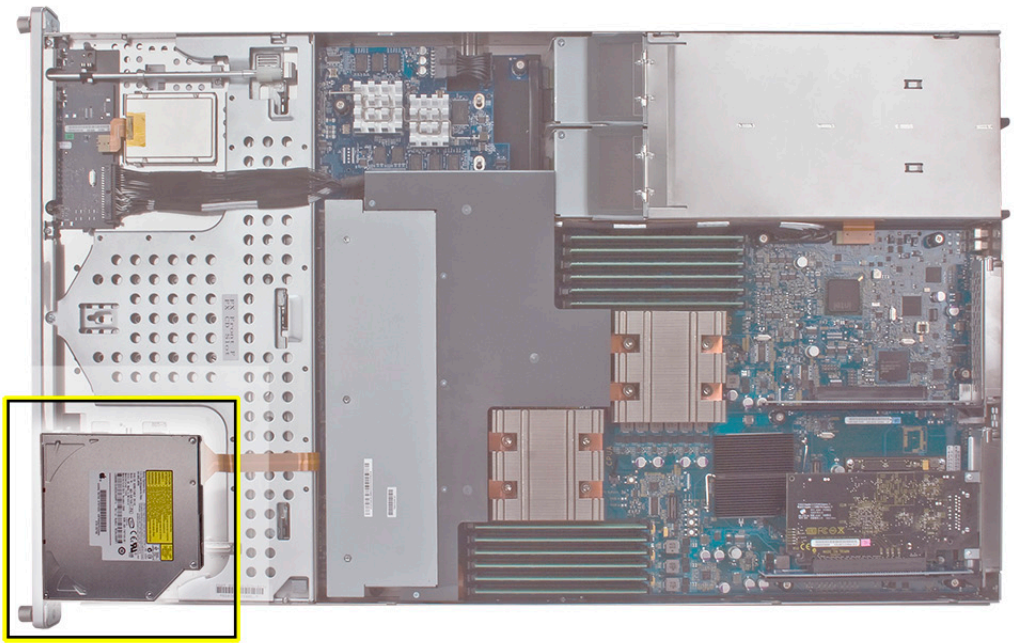


Optical Drive

First Steps

Remove:

- Top Cover

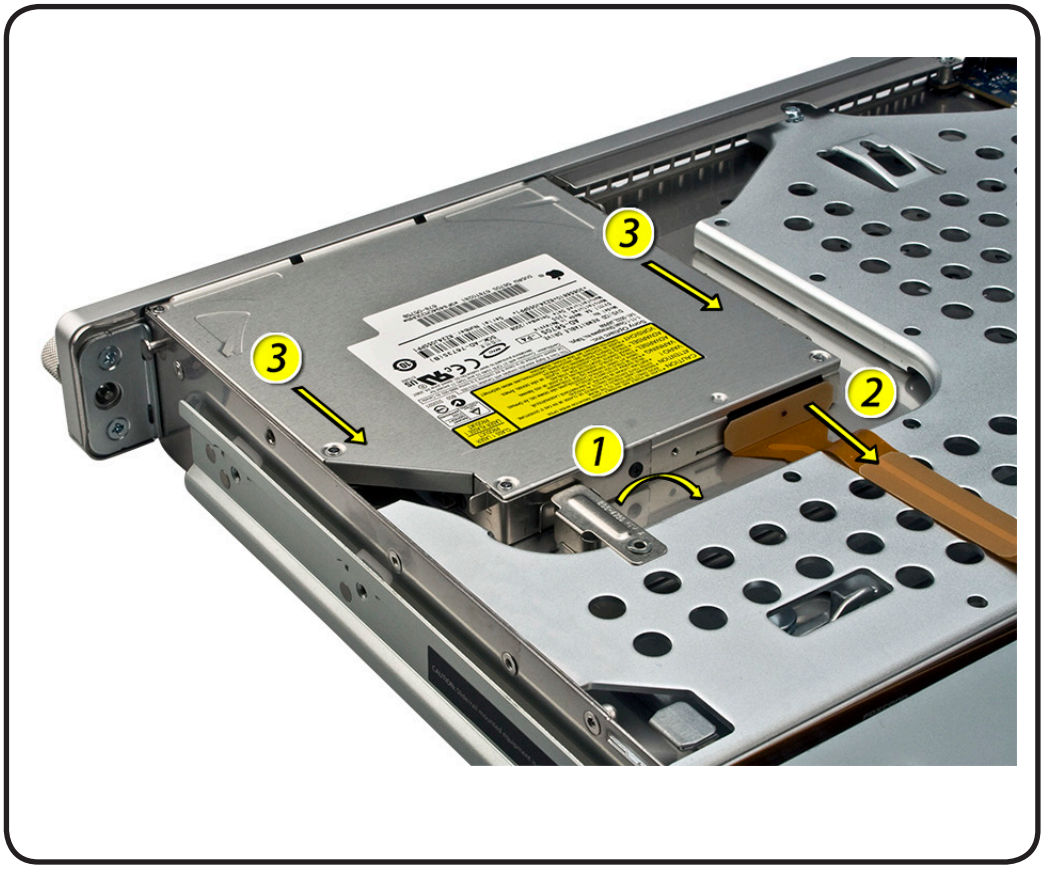


Tools

- ESD wrist strap and mat
- Phillips #0 screwdriver

Removal

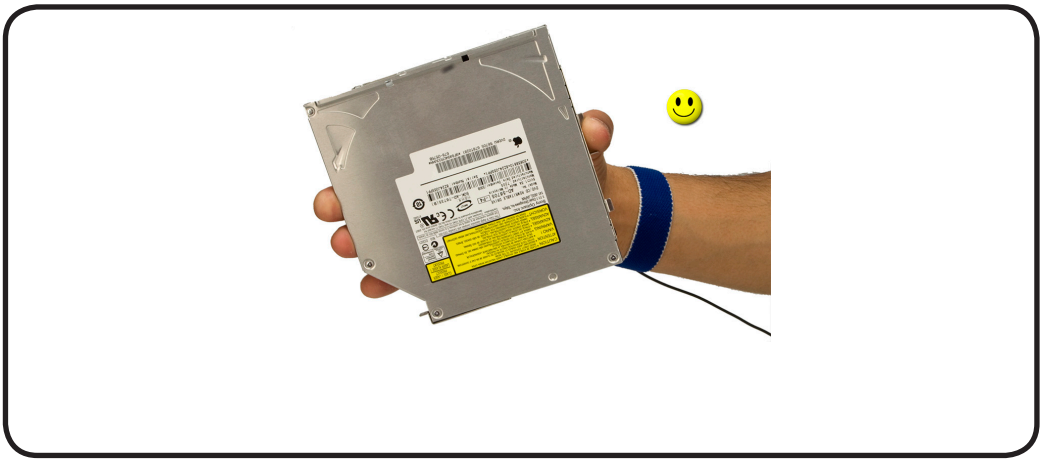
1 Disconnect optical drive cable from drive.



2 Rotate the optical drive clip clockwise to release it.

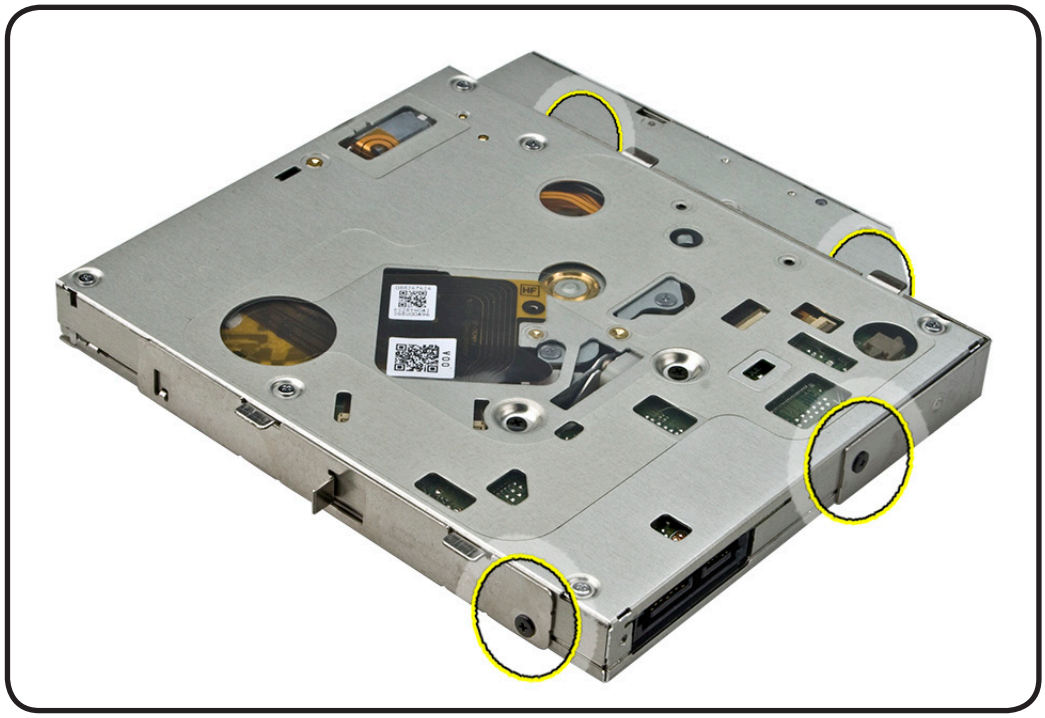
3 Placing your thumbs on either side of the drive, slide the drive back from the front bezel.

4 Lift drive out of the Xserve.



Important: When removing or replacing the optical drive, do not put pressure on the top of the drive of front bezel of the optical drive slot.

5 Remove the mounting screw from left and right bracket.



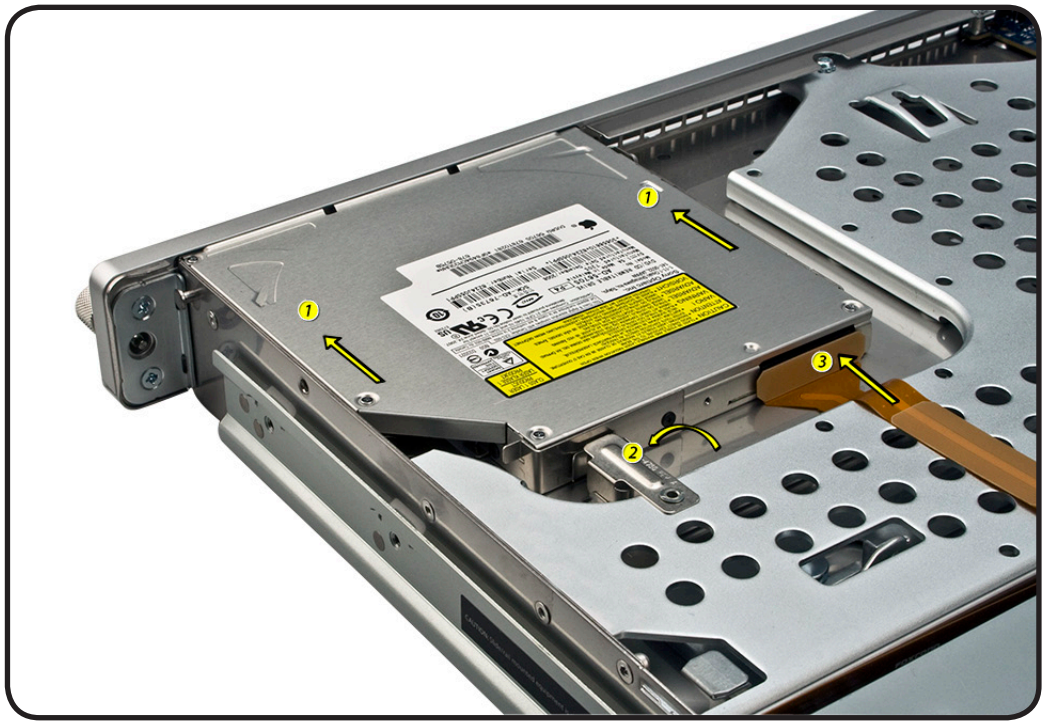
Replacement

1 Transfer the left and right brackets to the new drive.

2 Place the drive into the Xserve.

3 Placing your thumbs on either side of the drive, slide the drive forward towards the front bezel.

4 Rotate the optical drive clip counterclockwise to secure it.

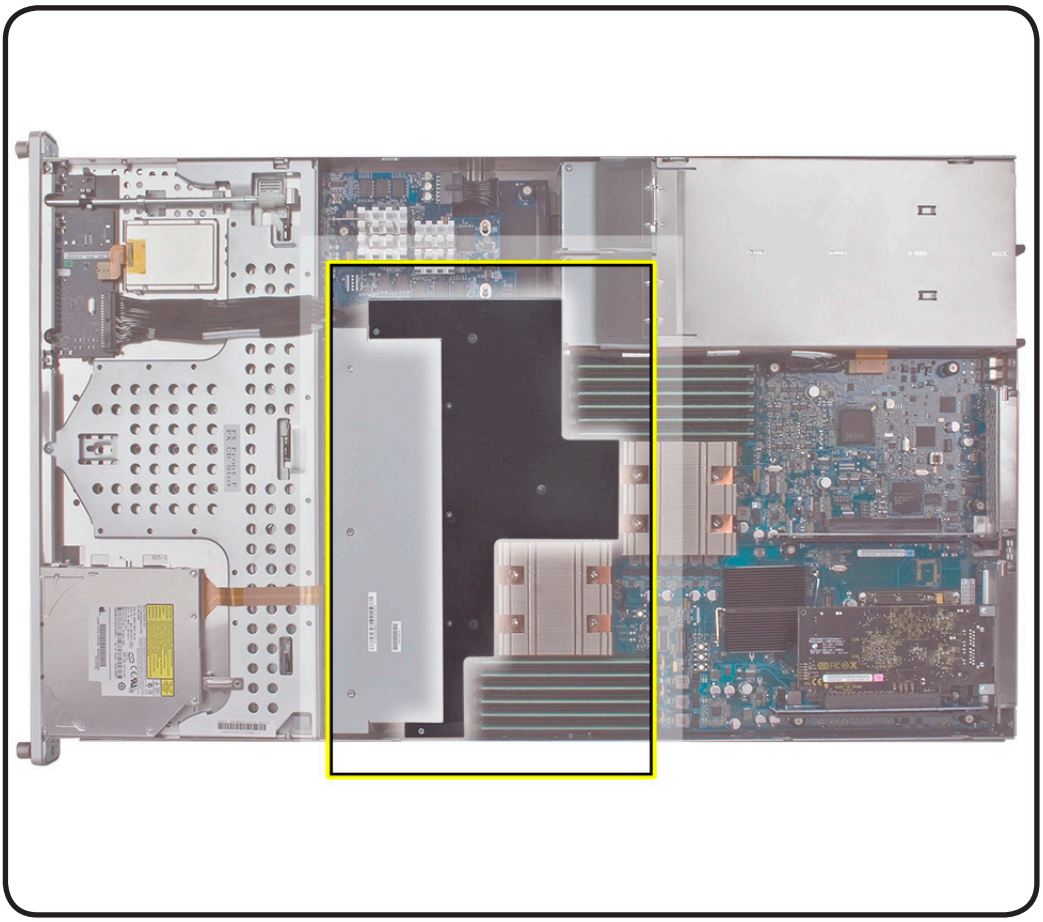


Airflow Duct

First Steps

Remove:

- Top Cover



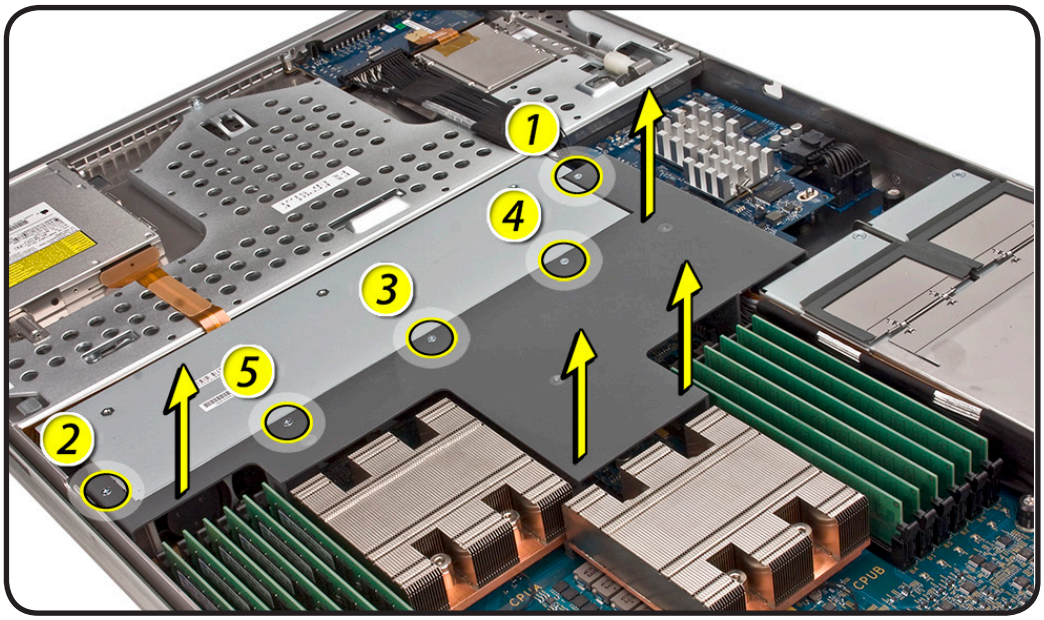
Tools

- ESD wrist strap and mat
- Phillips #1 screwdriver

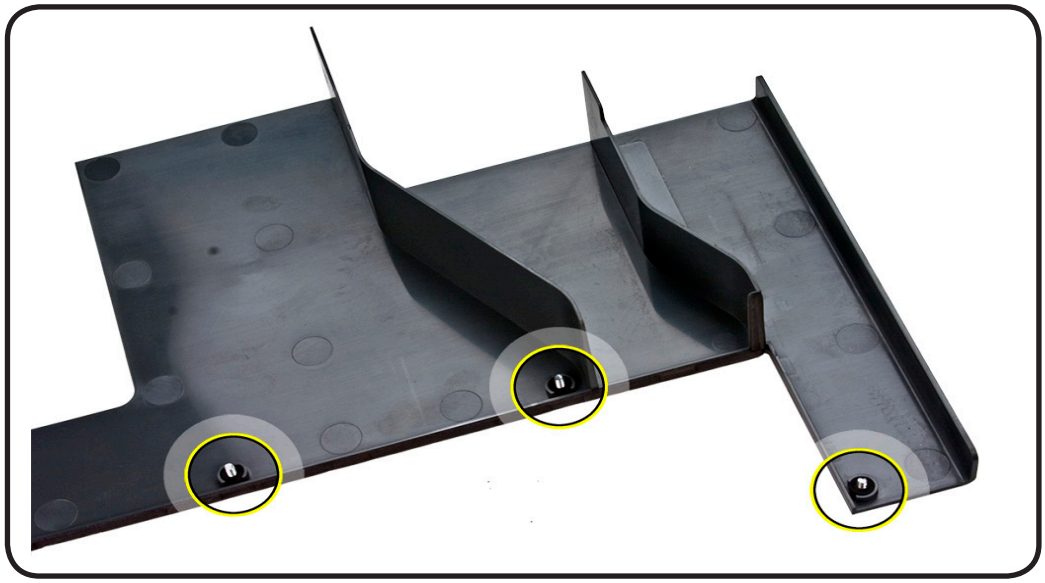
Removal

1 Loosen the five screws that fasten the airflow duct to the fan array.

2 Pull up on either side of the airflow duct, and lift straight up.



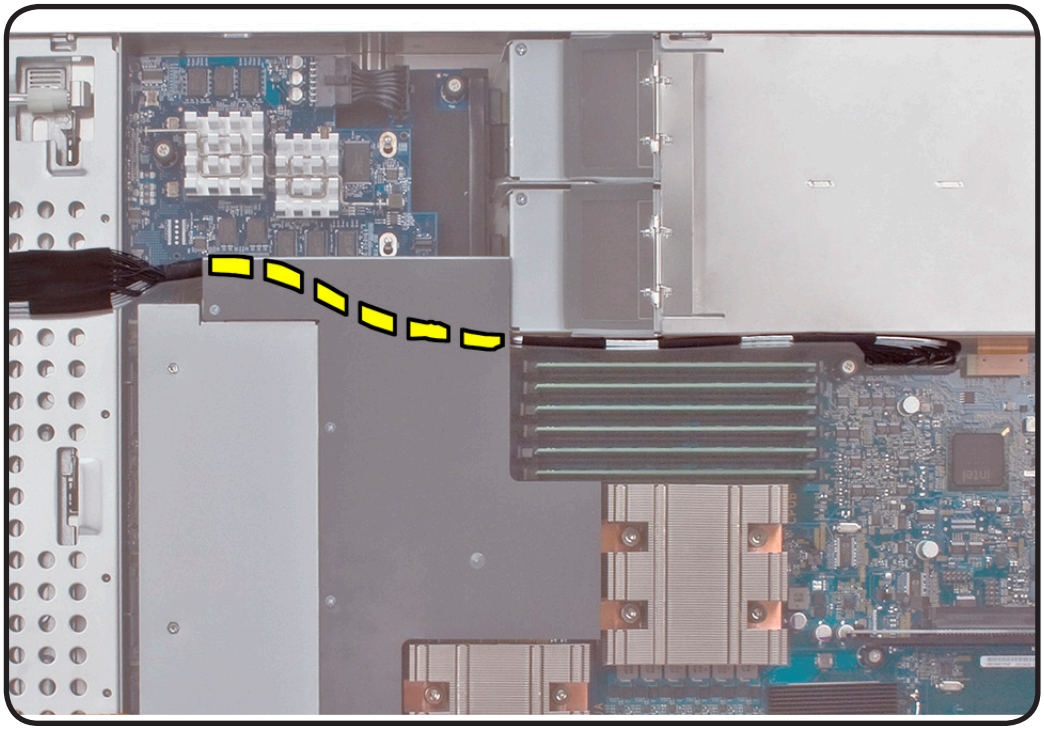
Removal Note: Remove screws in the order shown. Do not overtighten screws.



Caution: Do not completely remove the screws from the airflow duct. Tiny black rubber washers hold these screws captive on the underside of the airflow duct. If the screws are completely removed, these rubber washers can easily fall into the enclosure and become lost.

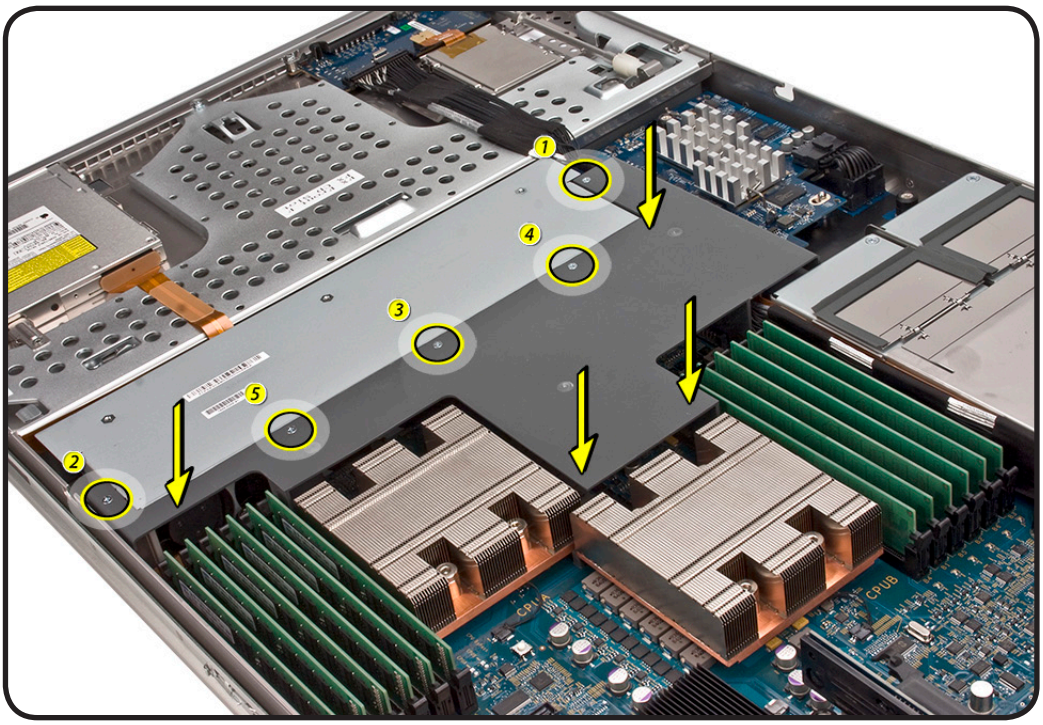
Replacement

1 Be sure to route both the front panel cable and the backplane-to-logic board I/O cable inside the channel under the duct.



2 Ensure the airflow duct fits flush and does not protrude above the enclosure.

3 Tighten the five Phillips screws that fasten the airflow duct to the fan array.



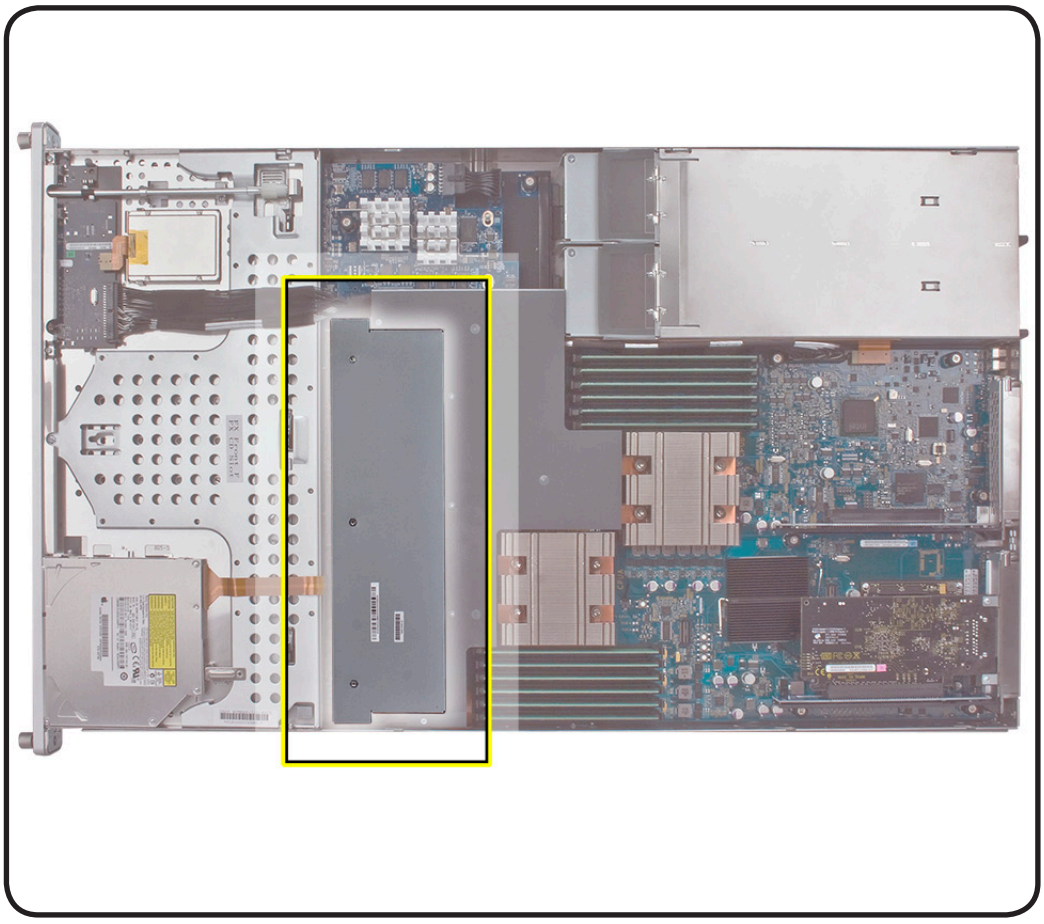
Removal Note: Remove screws in the order shown. Do not overtighten screws.

Fan Array

First Steps

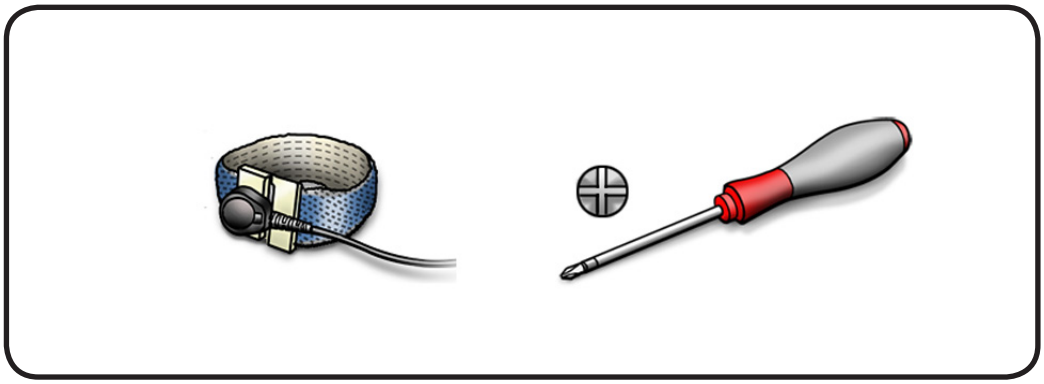
Remove:

- Top Cover
- Airflow Duct

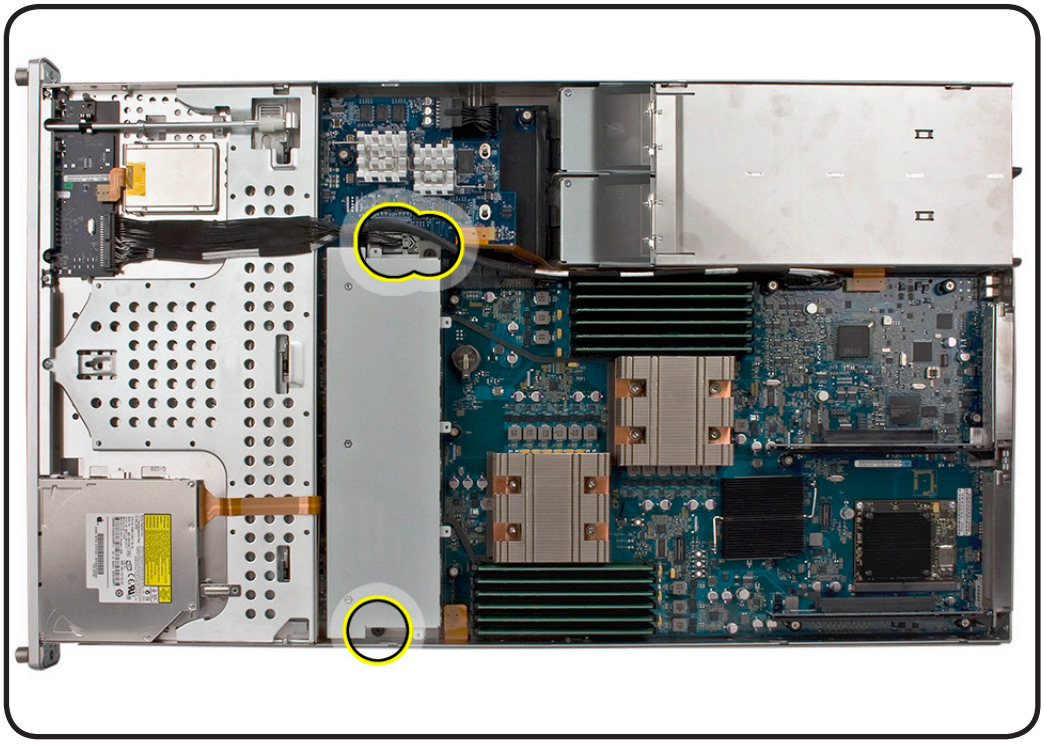


Tools

- ESD wrist strap and mat
- Phillips #1 screwdriver



Removal

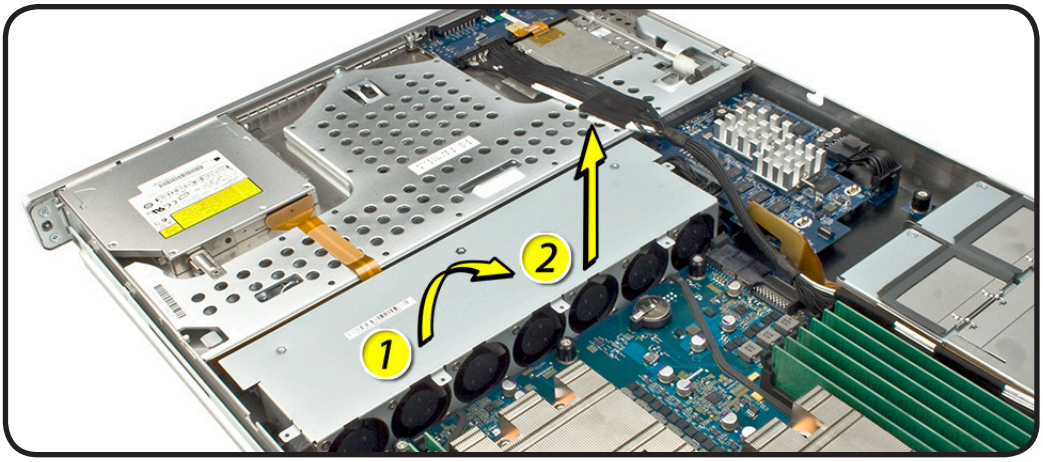


1 Loosen the two thumbscrews. You may need to use a Phillip #1 screwdriver.

Removal Note: The thumbscrews are captive; you cannot remove them.

2 Carefully rotate the fan array as shown to disconnect it from power distribution board.

3 Lift the fan array to remove it from the Xserve.

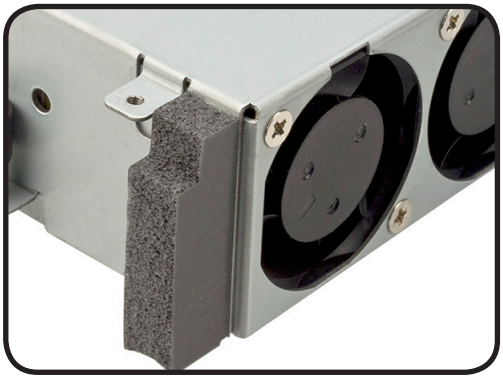


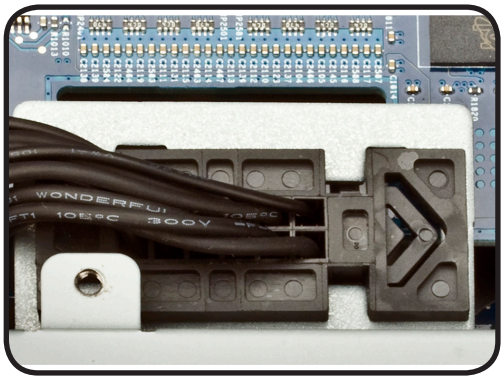
Removal Note: You may need to move the front panel cable slightly out of the way during removal or replacement. Be careful to not pinch the cable between the fan array and another surface.

Replacement

1 Verify the foam strip is included as shown.

2 Push down on the fan array power connector to seat it.



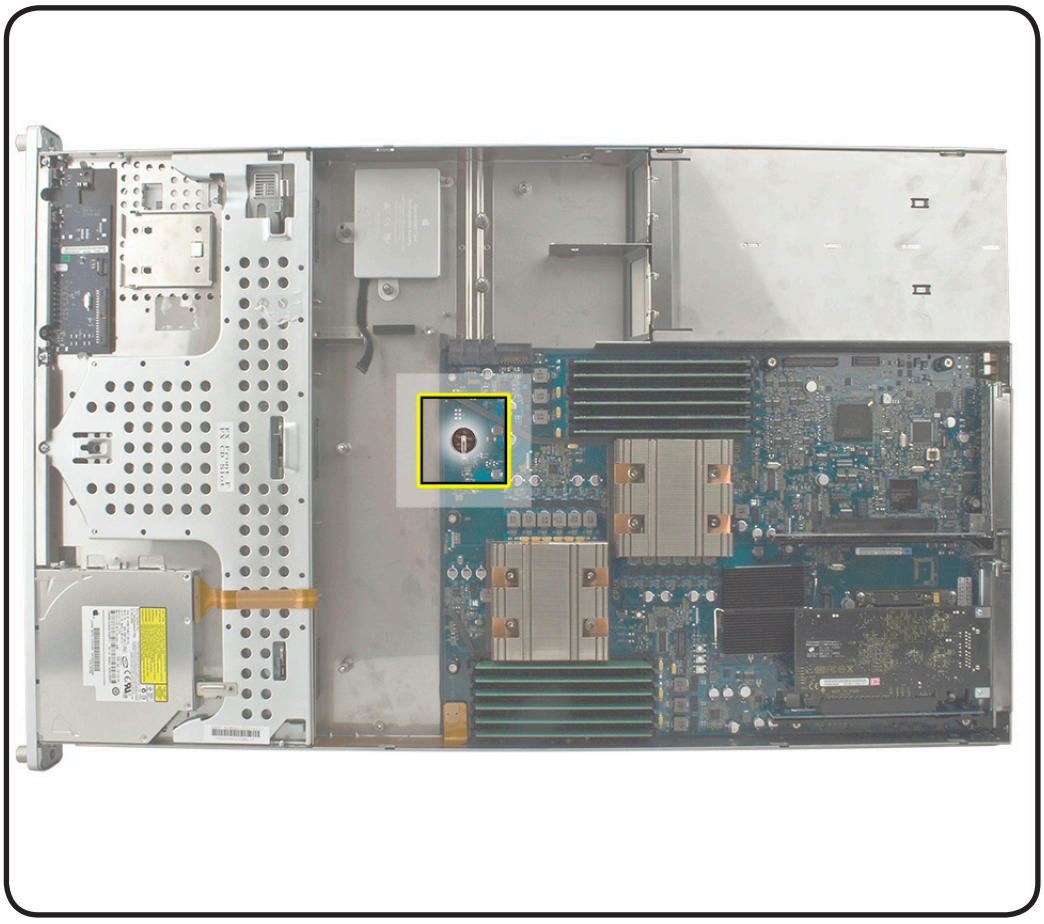


Battery

First Steps

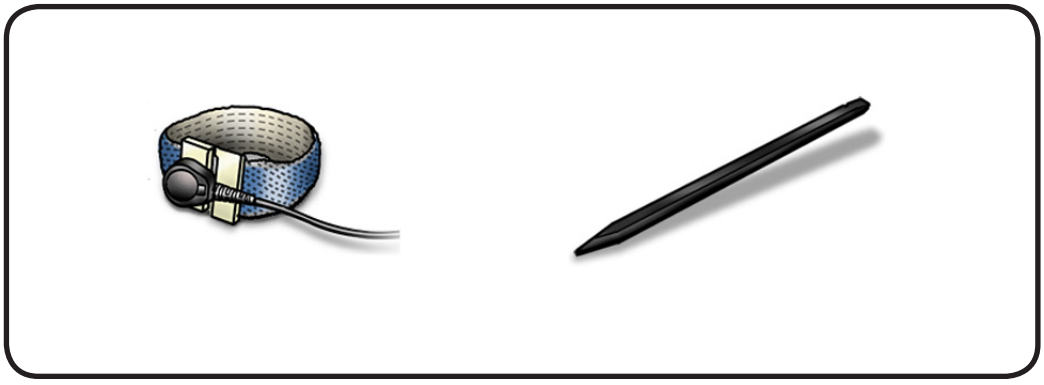
Remove:

- Top Cover
- Airflow Duct



Tools

- ESD wrist strap and mat
- Black stick



Removal

1 Insert the black nylon tool under the battery to ease the grip between the spring and holder.

2 Slide the battery out to remove from the holder.

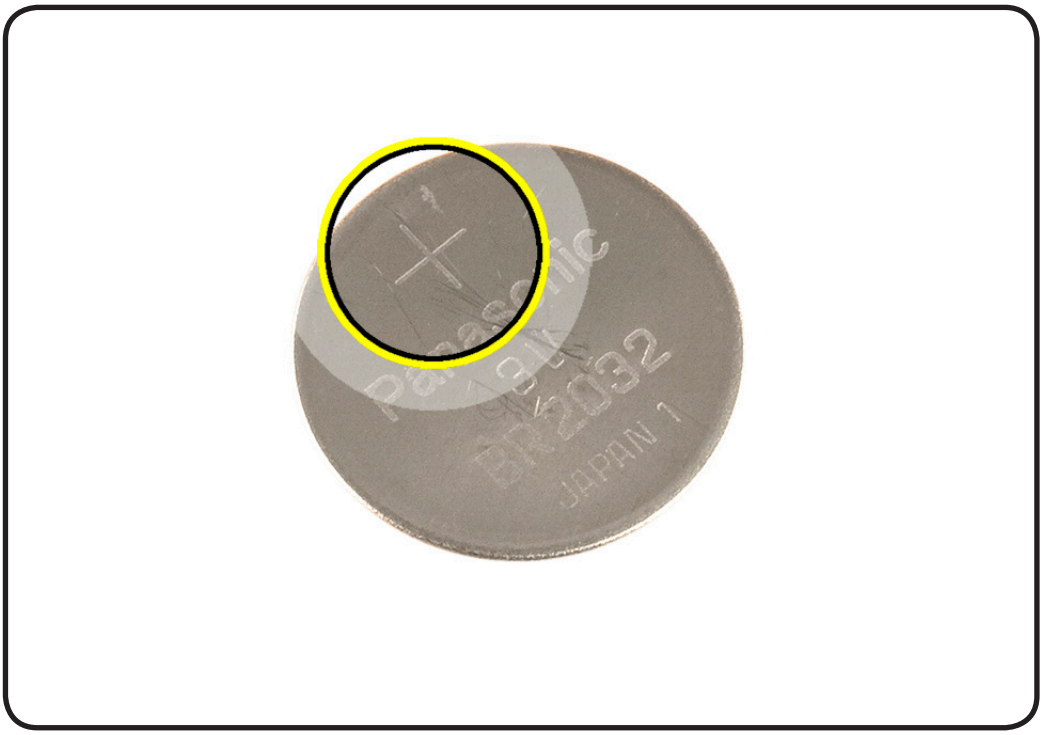
Warning: To avoid risk of explosion, replace battery only with type BR2032.

Replacement

1 Insert the replacement battery in the holder.

2 Remove the insulated tab.

3 Ensure the positive side (+) is up and the negative side down.



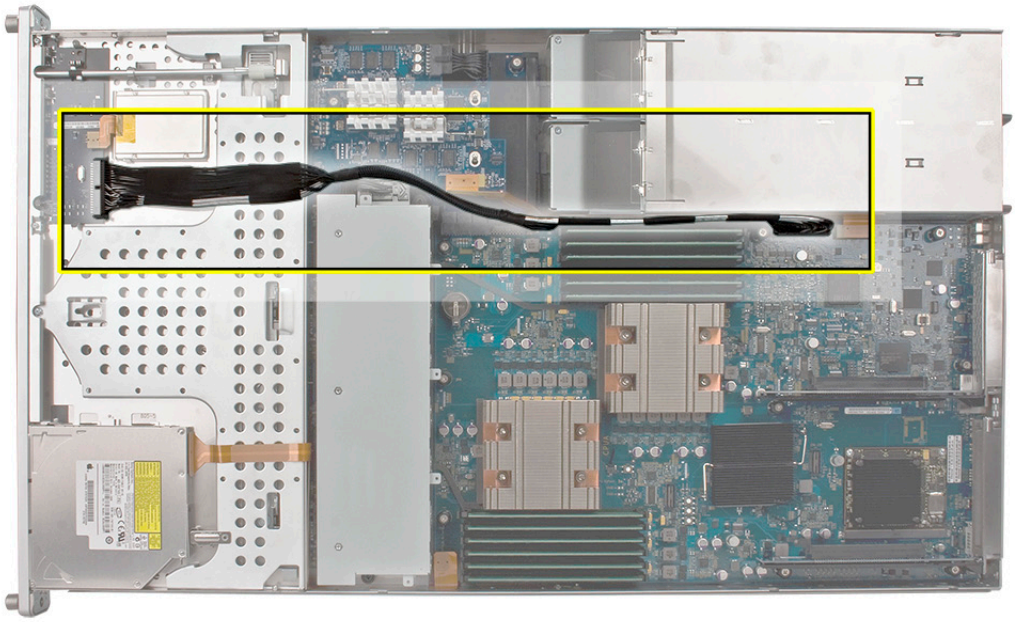
Important: Dispose of the battery according to manufacturer's instructions and your local environmental laws..

Front Panel Cable

First Steps

Remove:

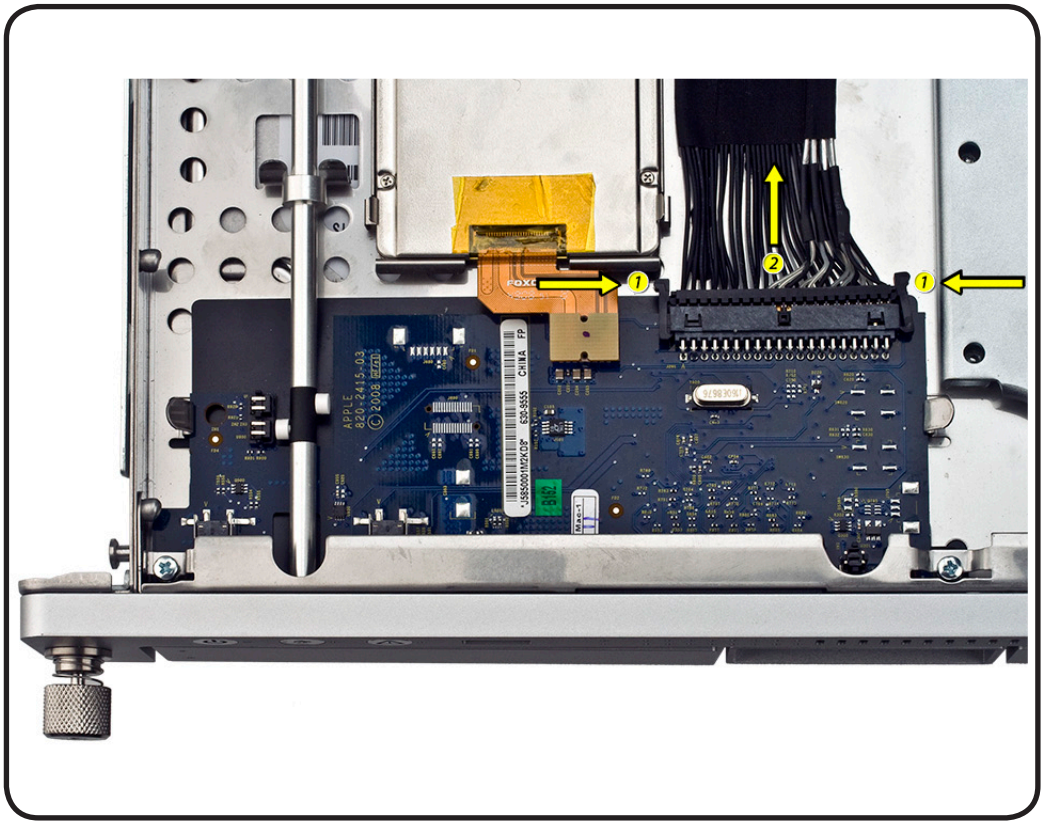
- Top Cover
- Airflow Duct
- PCI-E Riser Cards
- PCI-E Expansion Cards



Tools

- ESD wrist strap and mat
- Black stick

Removal



1 Release the locking levers on the cable connectors.

Removal Note: The black stick may help in unlocking the levers on the cable connectors.

2 Disconnect the front panel board cable from the front panel board.

3 Disconnect cable from the logic board.

4 Remove cable from the Xserve.

Replacement

1 Connect the cable to the logic board.

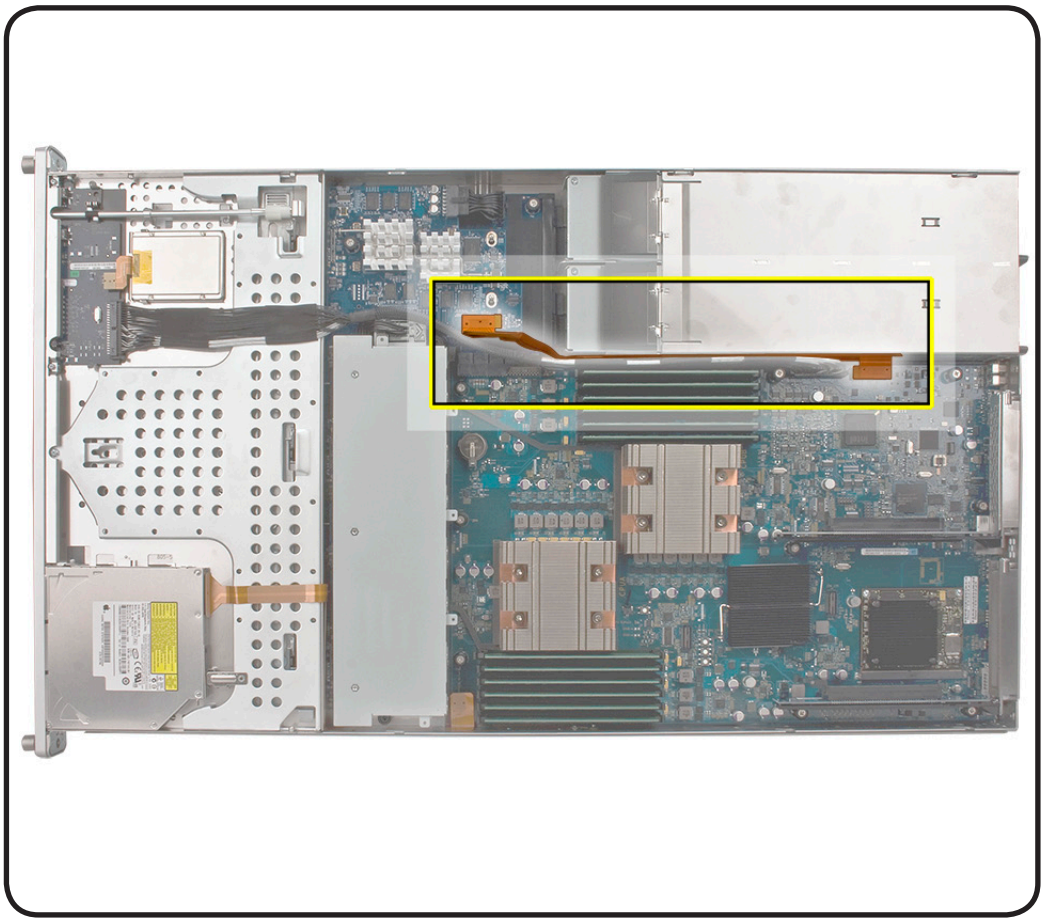
2 Connect the cable to the front panel board..

Backplane-to-Logic Board I/O Cable

First Steps

Remove:

- Top Cover
- Airflow Duct



Tools

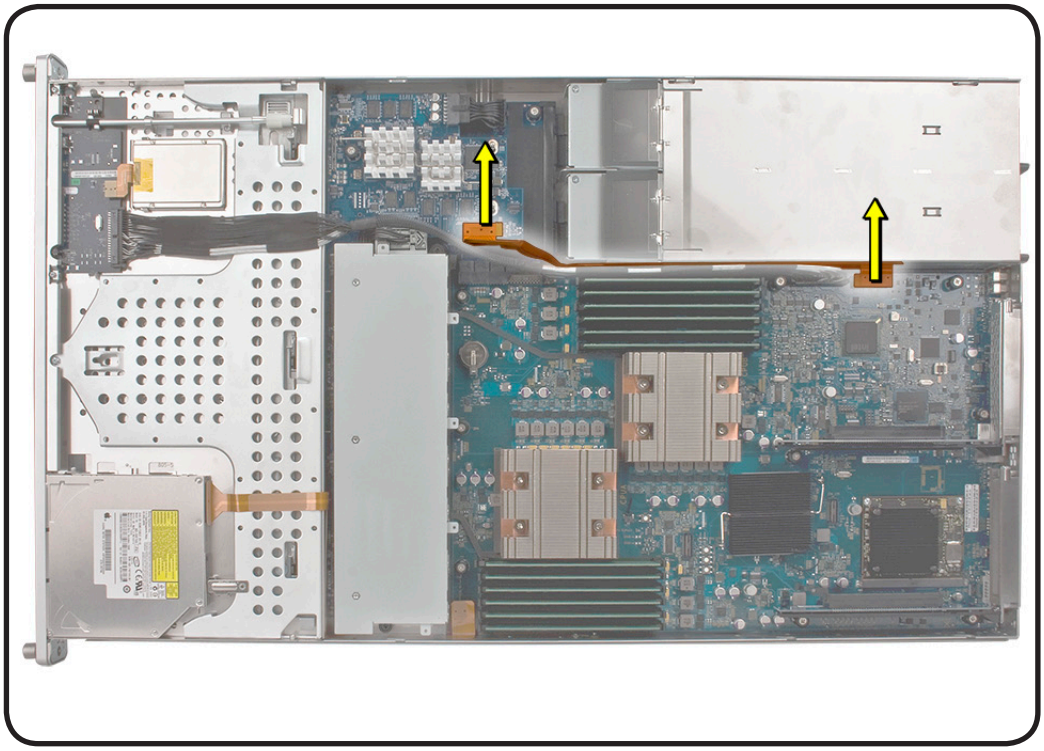
- ESD wrist strap and mat
- Black stick

Removal

1 Disconnect the backplane-logic board cable from logic board.

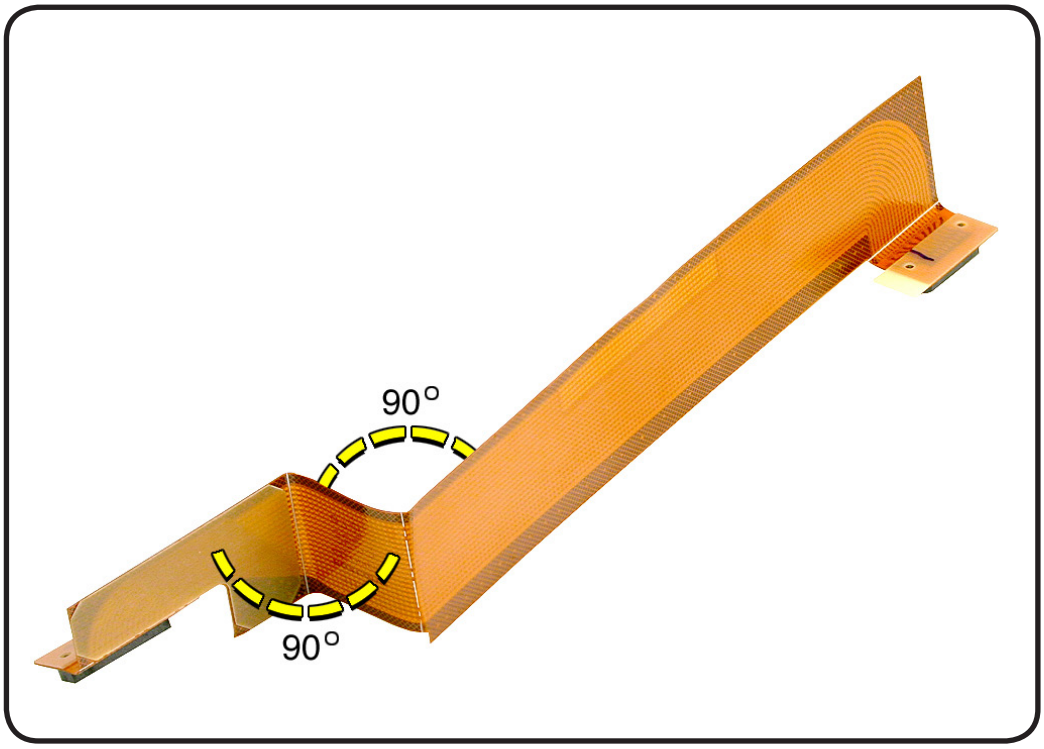
2 Disconnect the backplane-to-logic board cable from the drive interconnect backplane.

3 Remove cable from Xserve.



Replacement

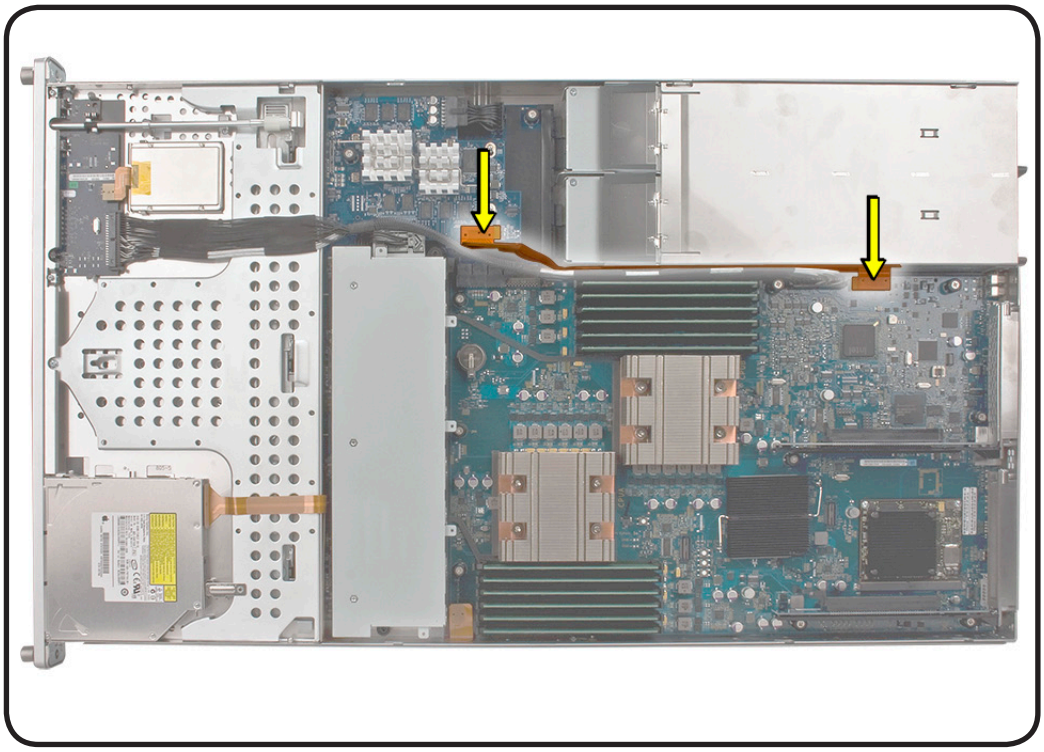
Replacement Note: Before installing the cable, fold it to a 90-degree angle along its creases.



1 Connect the cable to the logic board first.

2 Press adhesive section of cable onto enclosure.

3 Connect the cable to the backplane.



Caution: Make sure the cable is fully seated.

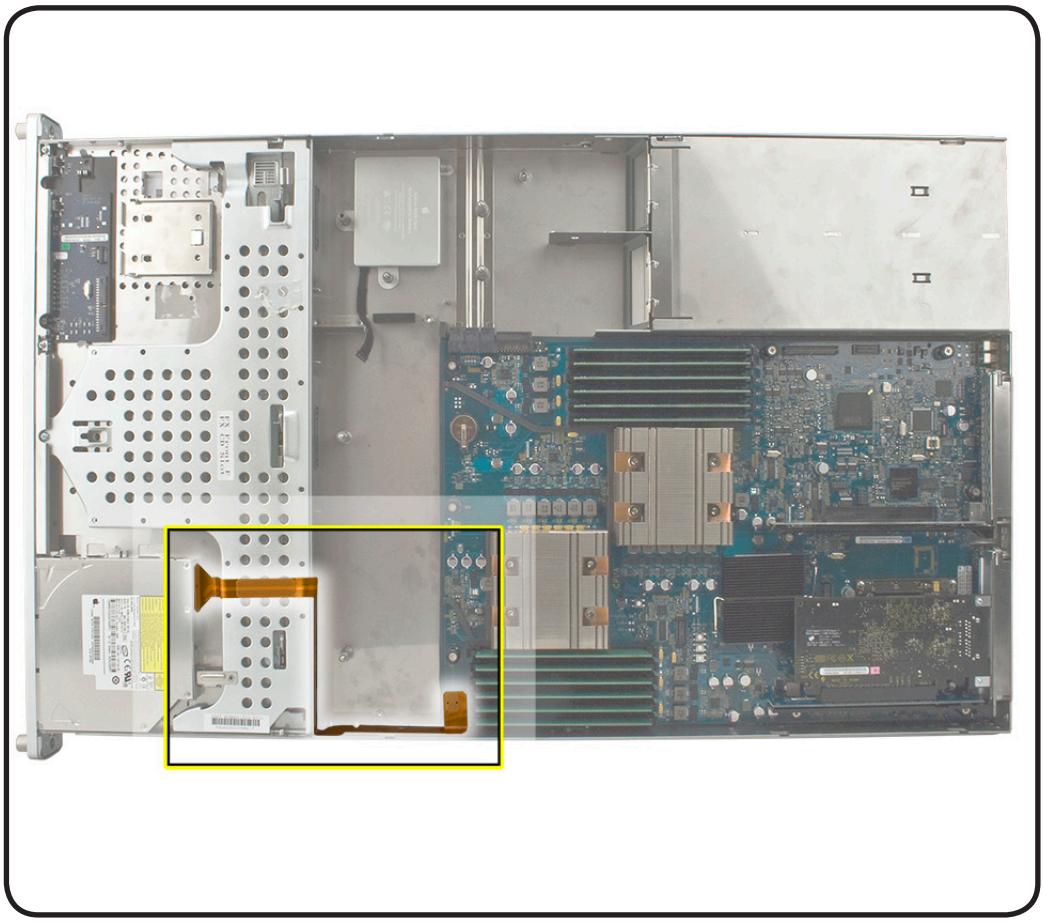
Optical Drive Cable

First Steps

Remove:

- Top Cover
- Airflow Duct
- Fan Array

Warning: The optical drive cable is attached to the enclosure with an adhesive on the underside of the cable.



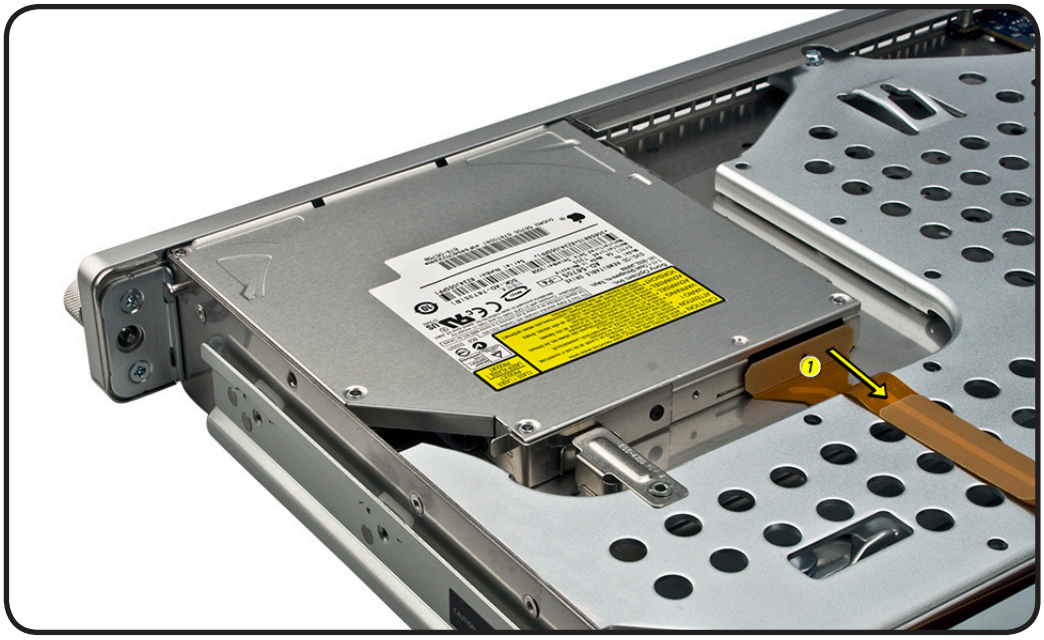
Tools

- ESD wrist strap and mat
- Black stick

Removal

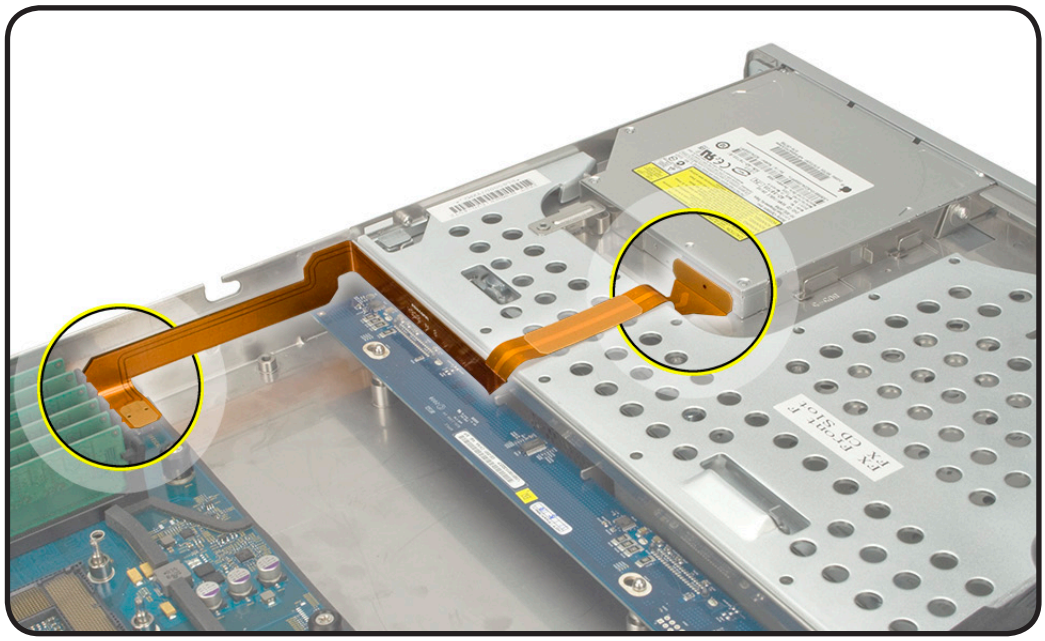
1 Disconnect the optical drive cable from the optical drive.

2 Disconnect the optical drive from the logic board.



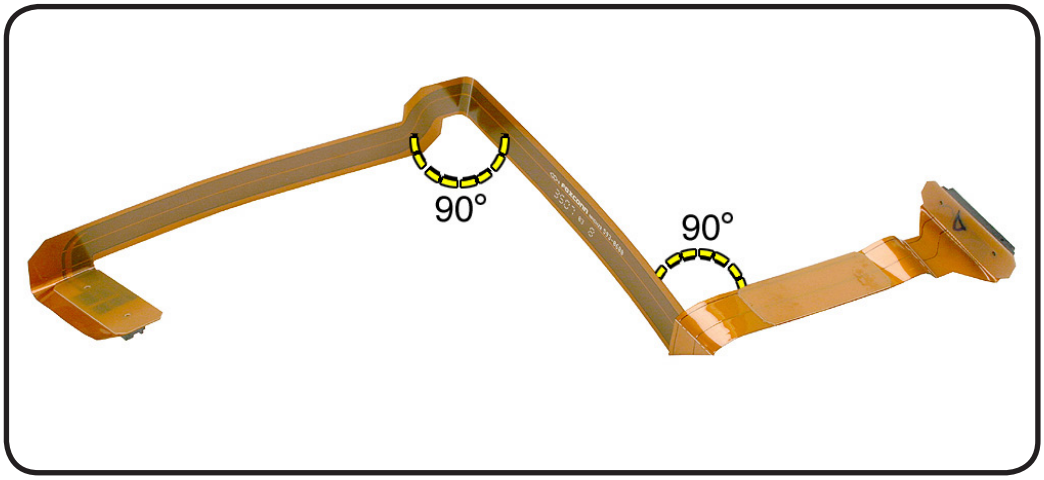
3 Carefully pry the cable's adhesive from the enclosure.

4 Remove cable from the Xserve.



Replacement

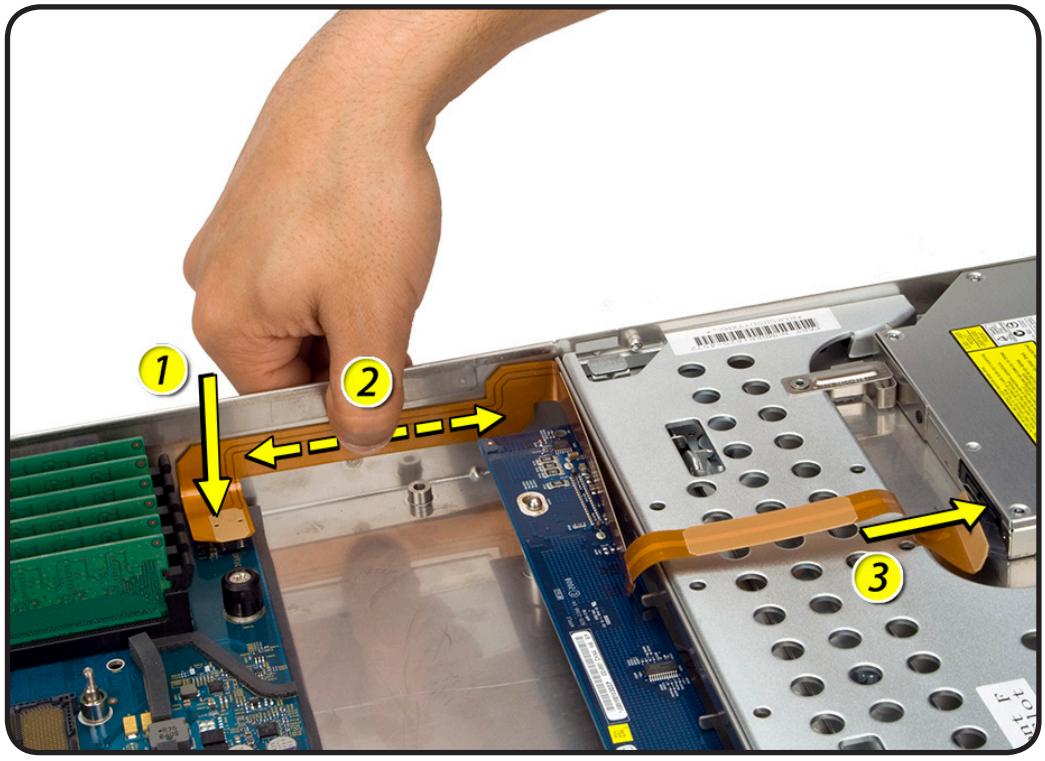
Replacement Note: Fold the replacement optical drive cable to 90-degree angles along its creases.



1 Connect the cable to the logic board.

2 Press the adhesive section of the cable onto the enclosure

3 Connect the other end of the cable to the optical drive.

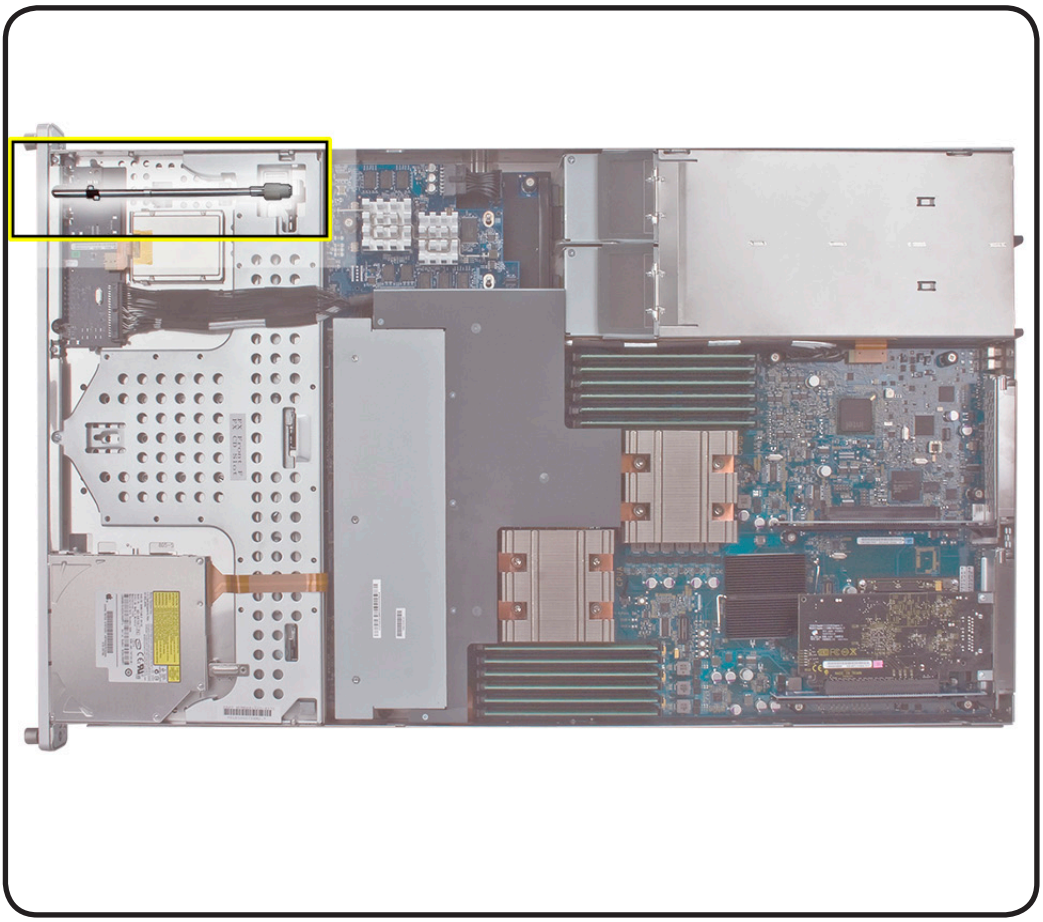


Locking Mechanism Rod

First Steps

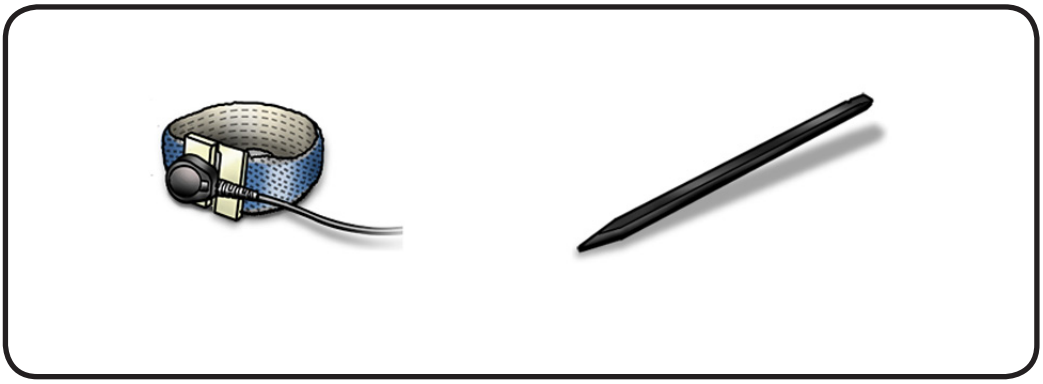
Remove:

- Top Cover



Tools

- ESD wrist strap and mat
- Black stick

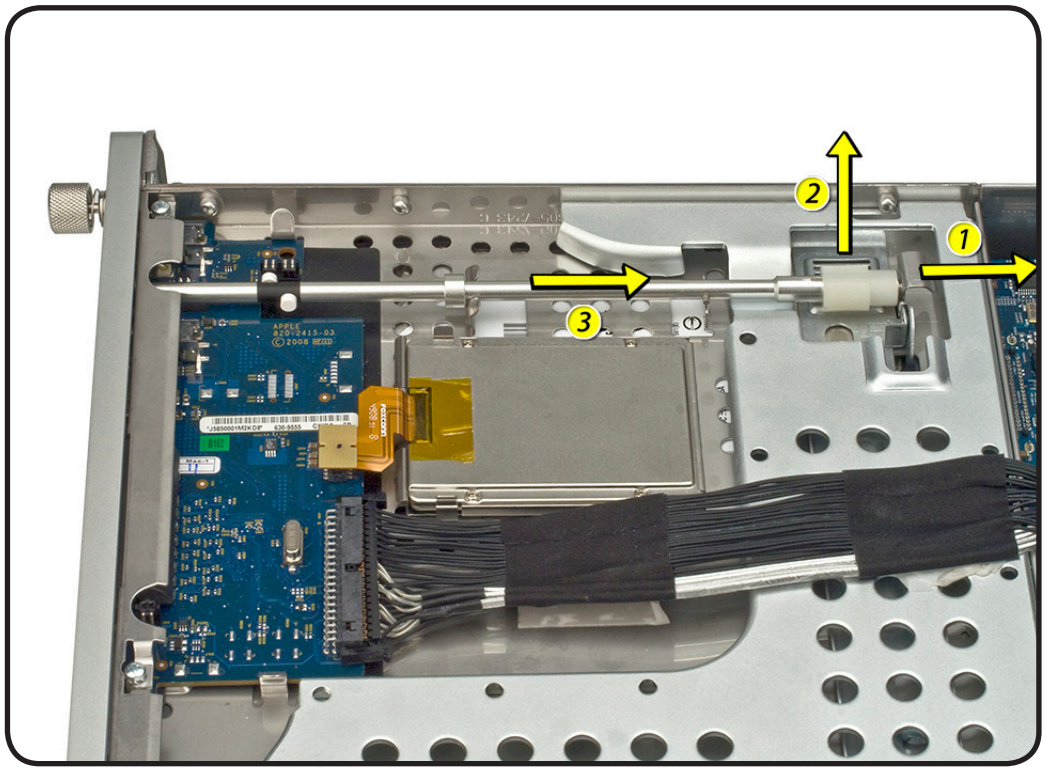


Removal

1 Gently pull back latch to release the gear of the locking mechanism rod.

2 Tilt up the gear end of the rod.

3 Remove the rod from the Xserve.



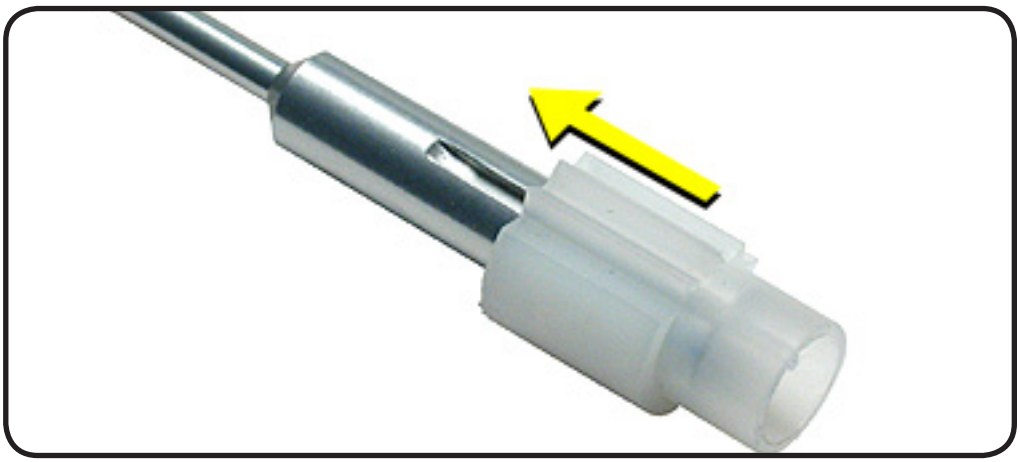
Removal Note: If you are replacing the plastic gear on the end of the rod, slide the gear off the rod.

Replacement

1 Slide the rod onto the notched end of the locking rod.

2 Align the narrow end of the gear with the end of the rod

3 Insert the key-hole end into the port on the front bezel.



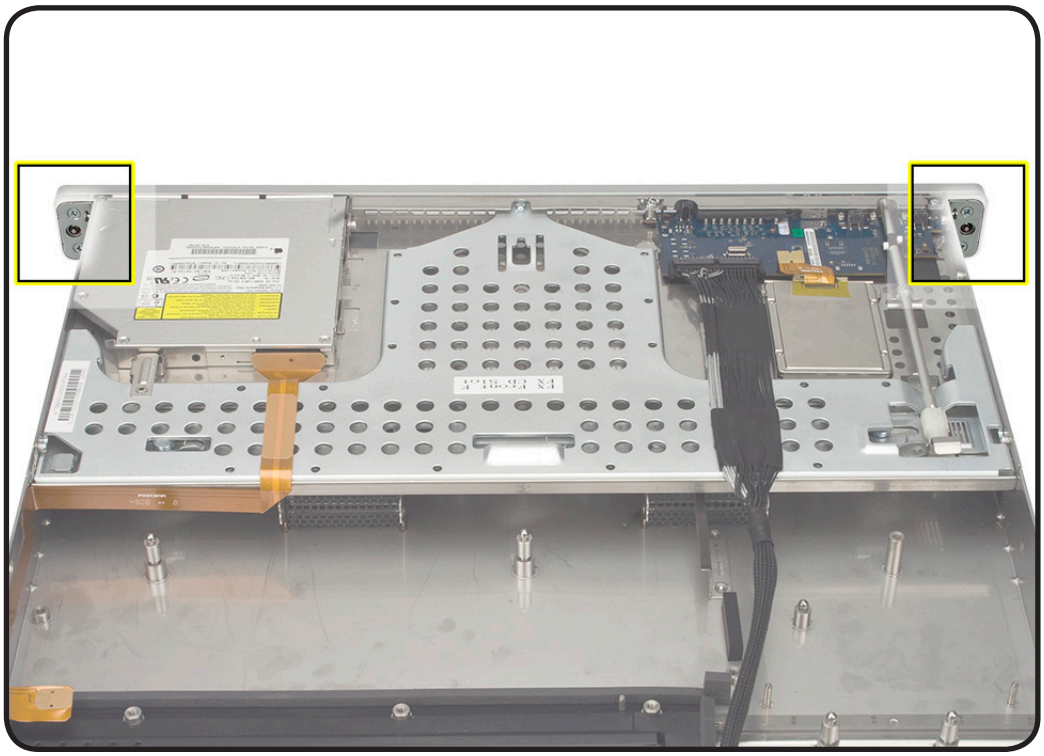
Replacement Notes: Make sure the rib inside the gear engages with the notch in the rod. Make sure the small circle on the front of the rod points to the left. It should align with the "unlocked" symbol on the bezel.

Front Bezel Brackets

First Steps

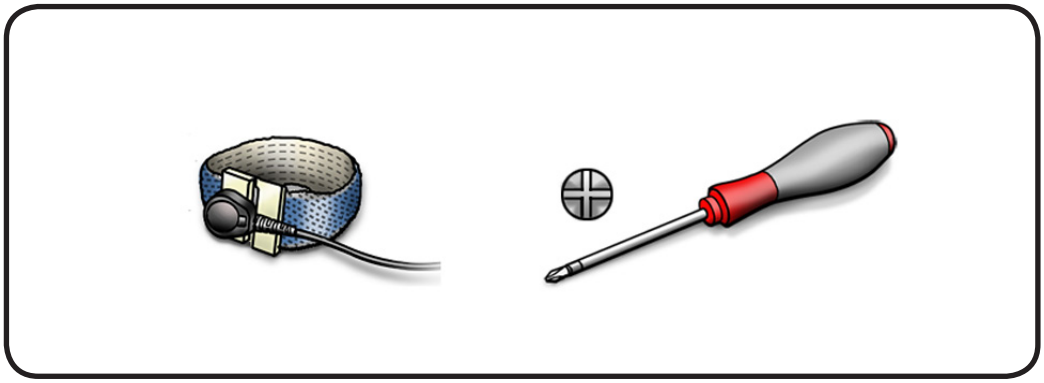
Remove:

- Top Cover



Tools

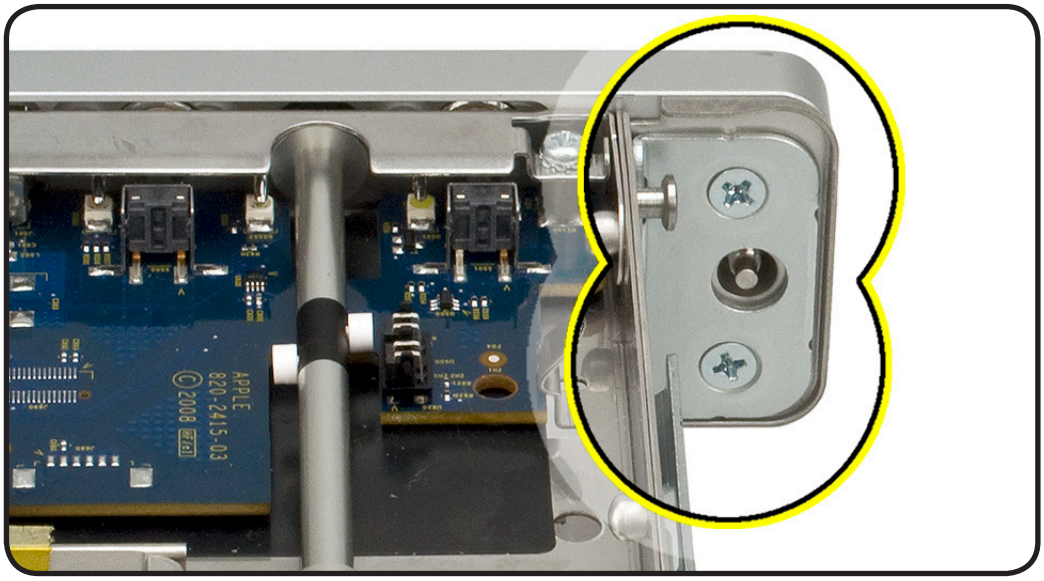
- ESD wrist strap and mat
- Phillips #2 screwdriver

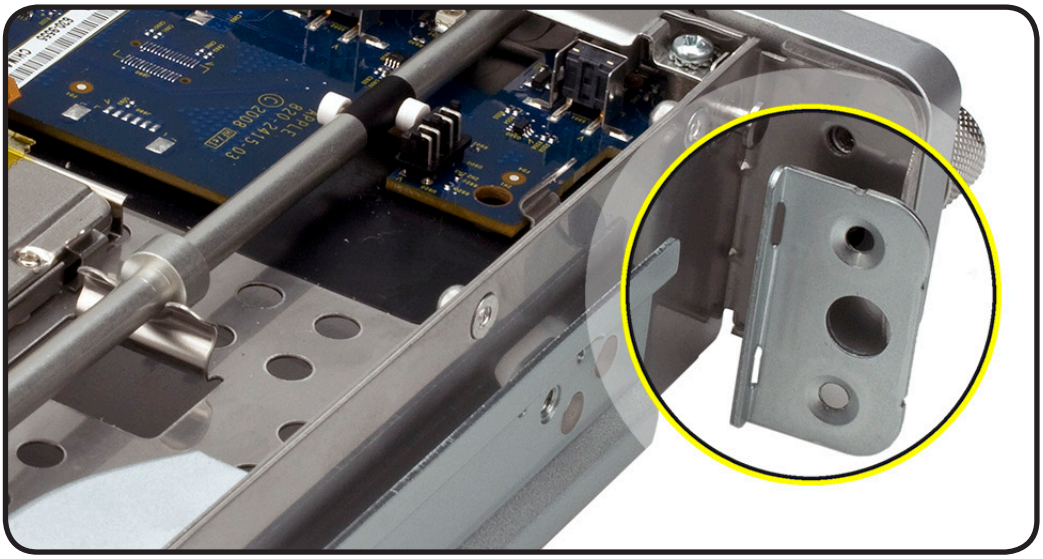


Removal

1 Remove the four identical 4-mm long screws.

2 Remove the two brackets.





Replacement

1 Position the right replacement bracket on the Xserve.

2 Install two 4-mm long screws.

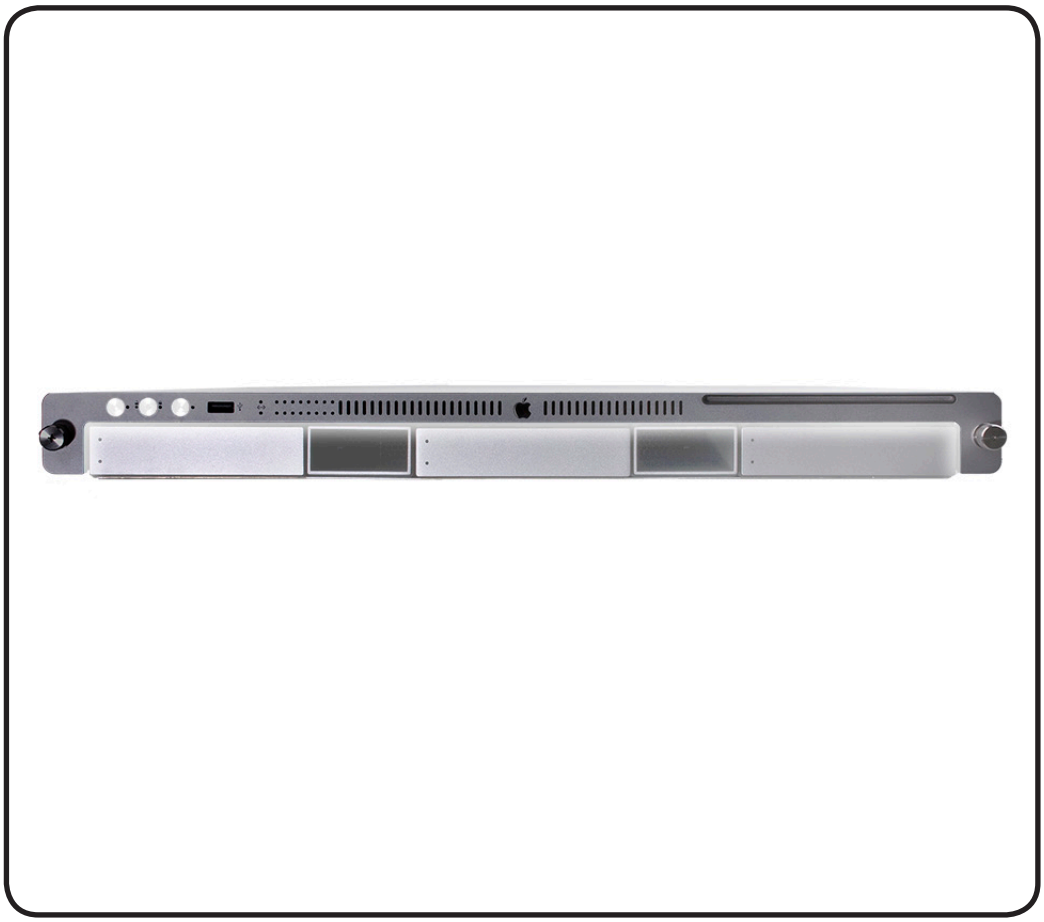
3 Repeat for the left bracket.

Front Bezel Assembly

First Steps

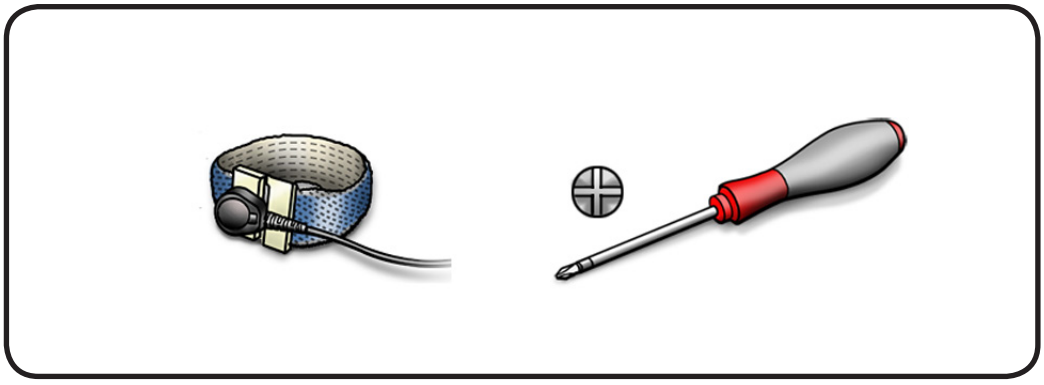
Remove:

- Apple Drive Module
- Power Supply
- Top Cover
- Front Bezel Brackets

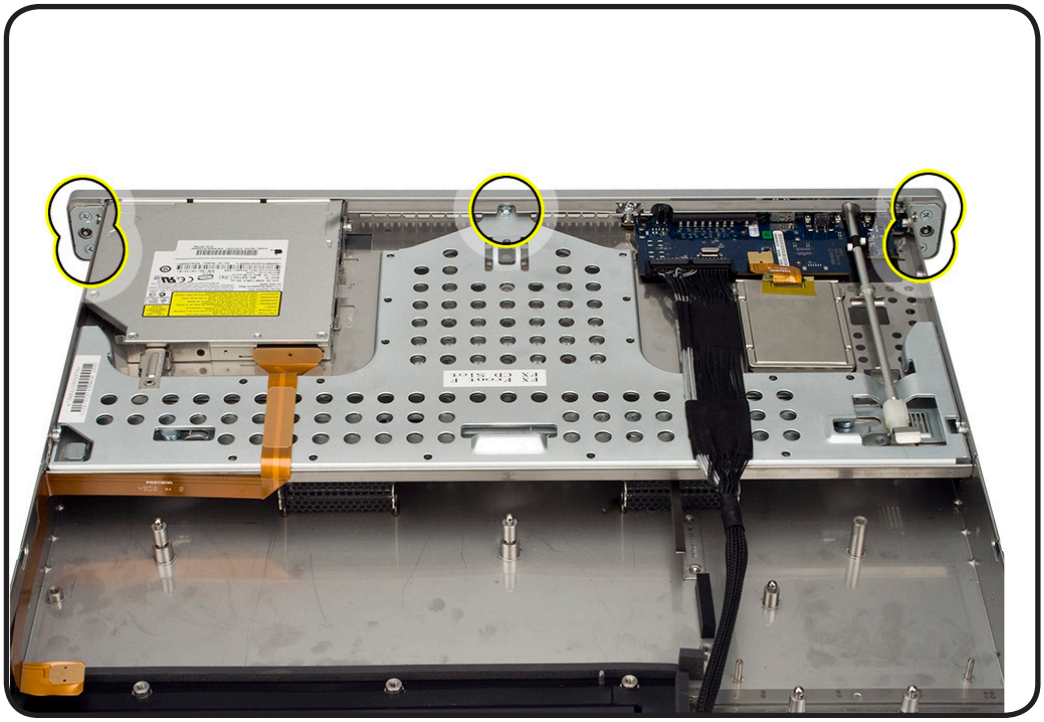


Tools

- ESD wrist strap and mat
- Phillips #2 screwdriver



Removal



1 Remove the four 4-mm long screws and two brackets from behind the front bezel brackets.

2 Remove the 8-mm long center screw.

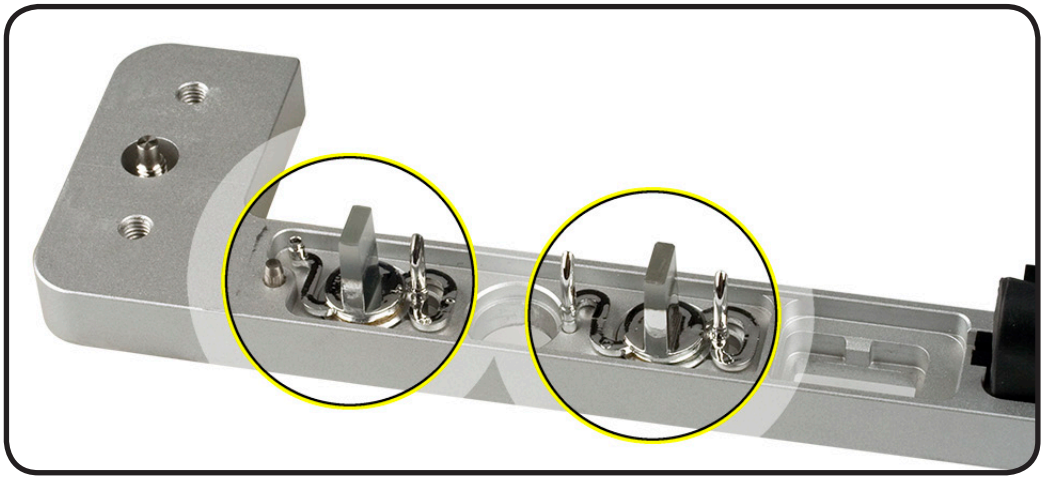
3 Gently pull the front bezel forward and remove from the Xserve.

Important: Do not put pressure on the top of the bezel over the optical drive slot.

Replacement

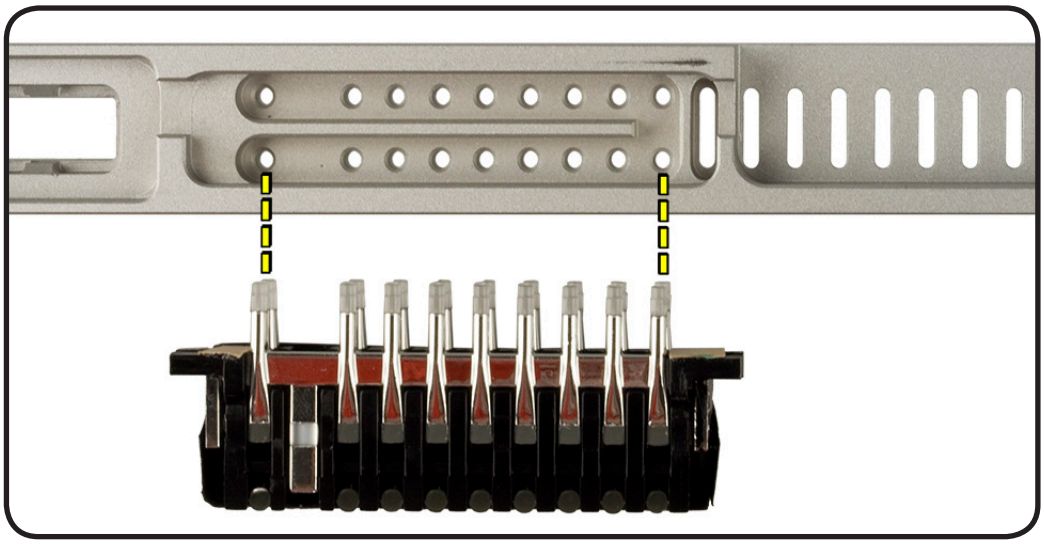
1 Leave the power and system identifier buttons on the front panel board.

2 Align the buttons with the front panel openings.



3 Secure the light pipe in the front bezel. Align the pins to the front bezel and insert into the slot.

4 Place the front bezel on the server, matching the opening with the buttons and ports.



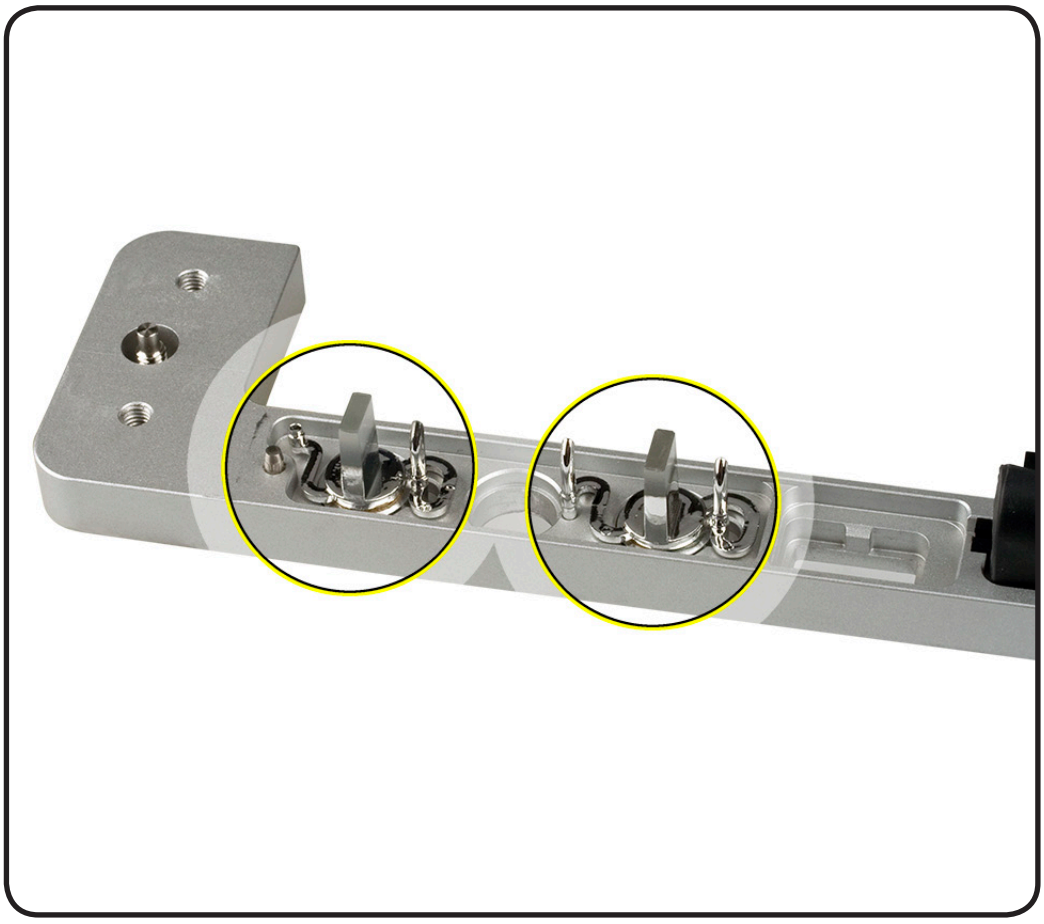
5 Replace the bezel brackets, four 4-mm long screws, and 8-mm long center screw.

Front Panel Buttons

First Steps

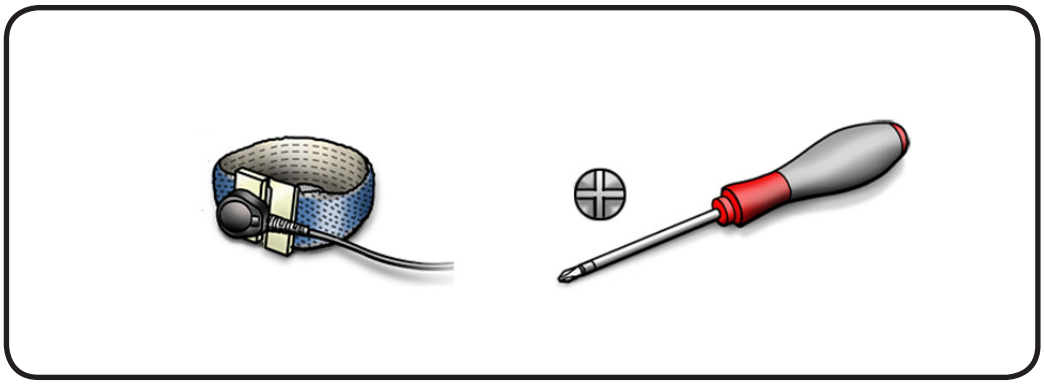
Remove:

- Top Cover
- Front Bezel Brackets
- Front Bezel Assembly

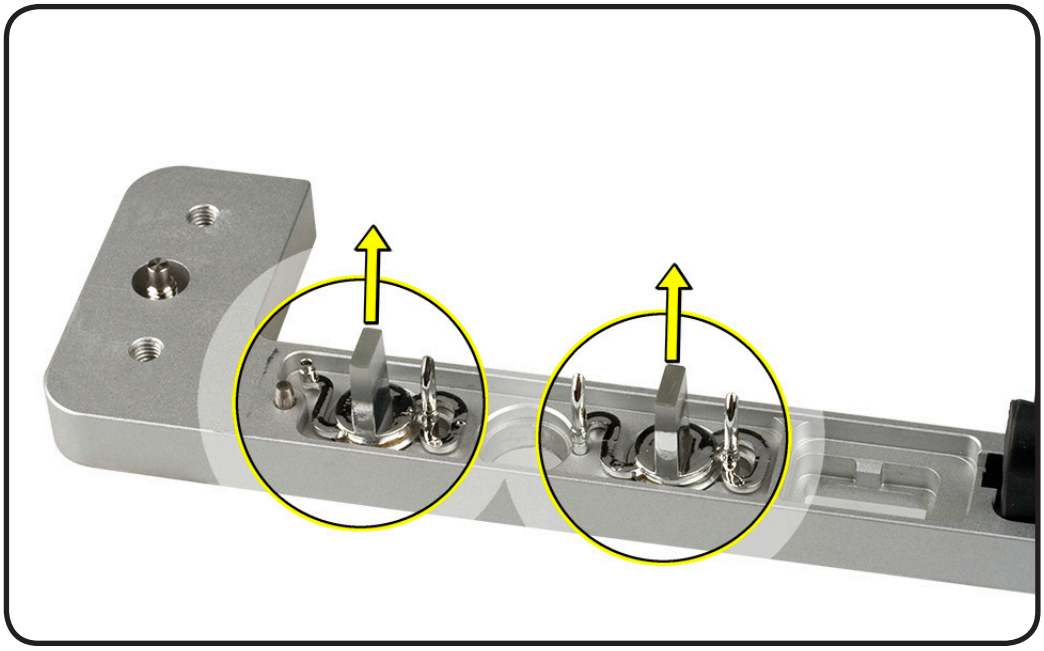


Tools

- ESD wrist strap and mat
- Phillips #2 screwdriver



Removal



1 Hold the power or system identifier button by the plastic tab.

2 Lift straight up and remove from the front bezel.

Removal Note: The face of the button is loosely attached to the button LED.

Replacement

1 Position the replacement button in the front bezel.

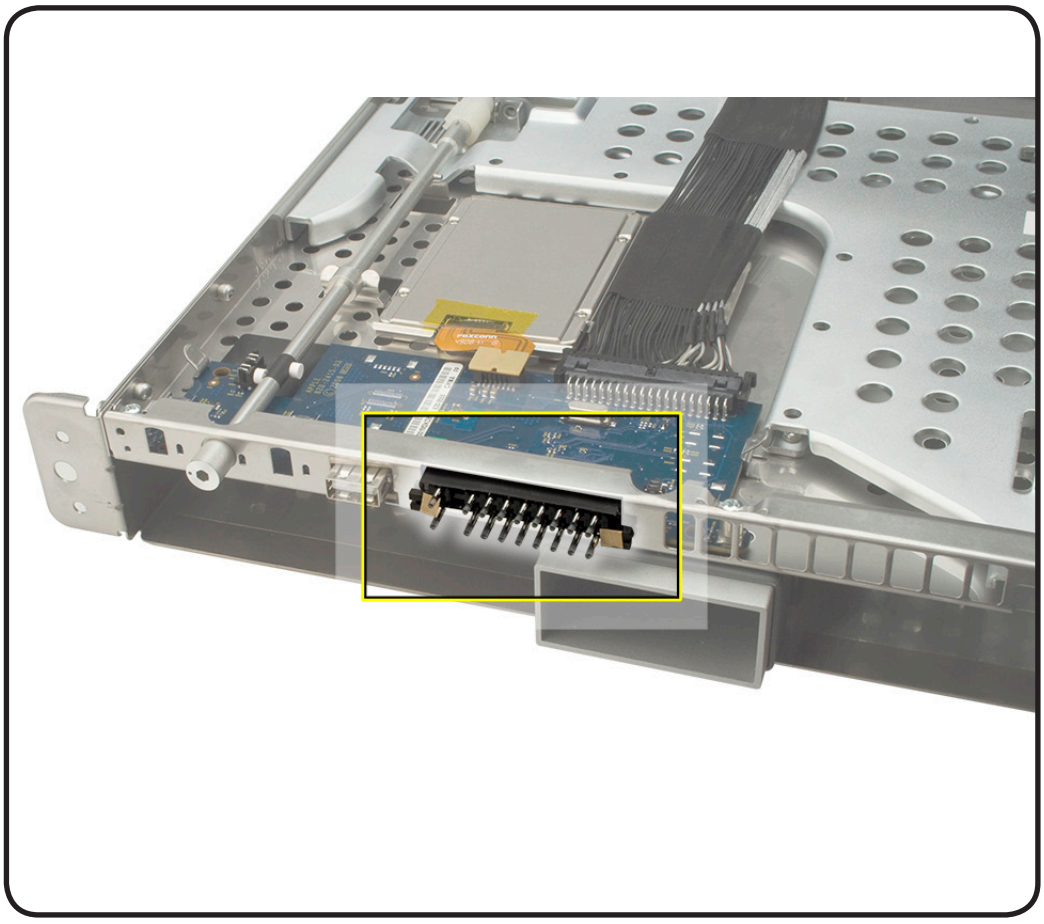
2 Verify the buttons are in the correct position.

Light Pipe

First Steps

Remove:

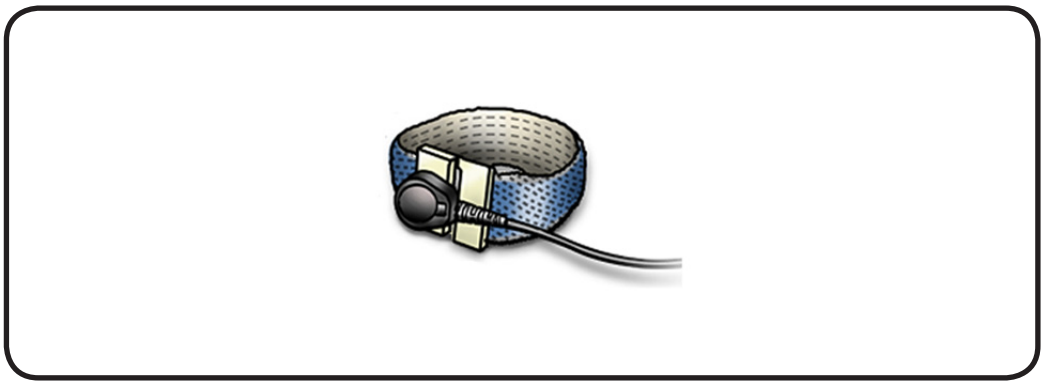
- Top Cover
- Front Bezel Brackets
- Front Bezel Assembly



The Light Pipe may come out with the front bezel assembly.

Tools

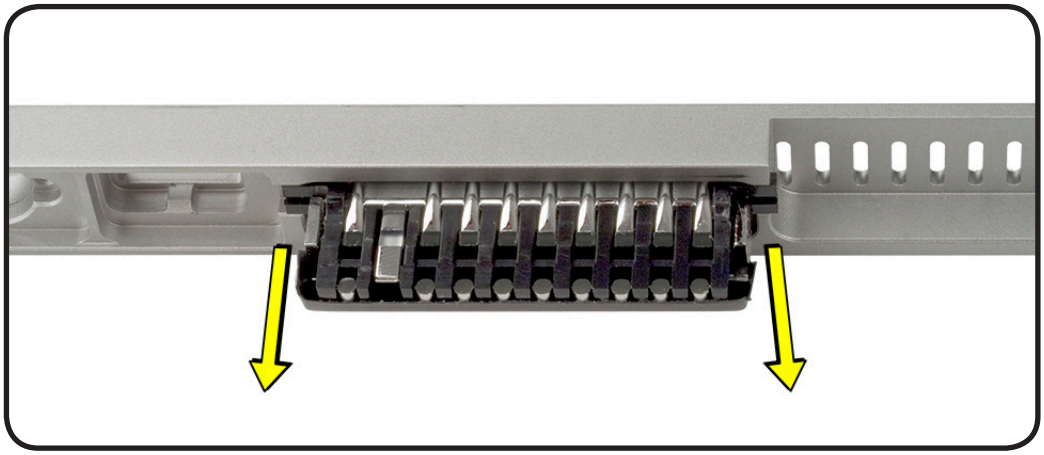
- ESD wrist strap and mat



Removal

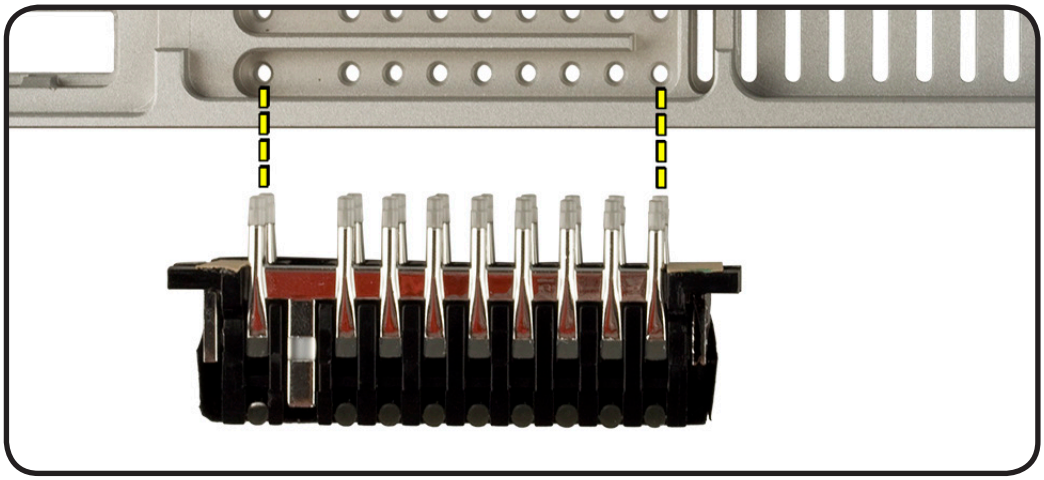
1 Grasp the edges of the light pipe.

2 Pull light pipe out of the front bezel assembly.



Replacement

1 Align the pins on the replacement light pipe with pin opening on front bezel assembly.



2 Gently press the light pipe into the front bezel assembly.

3 Replace front bezel assembly.

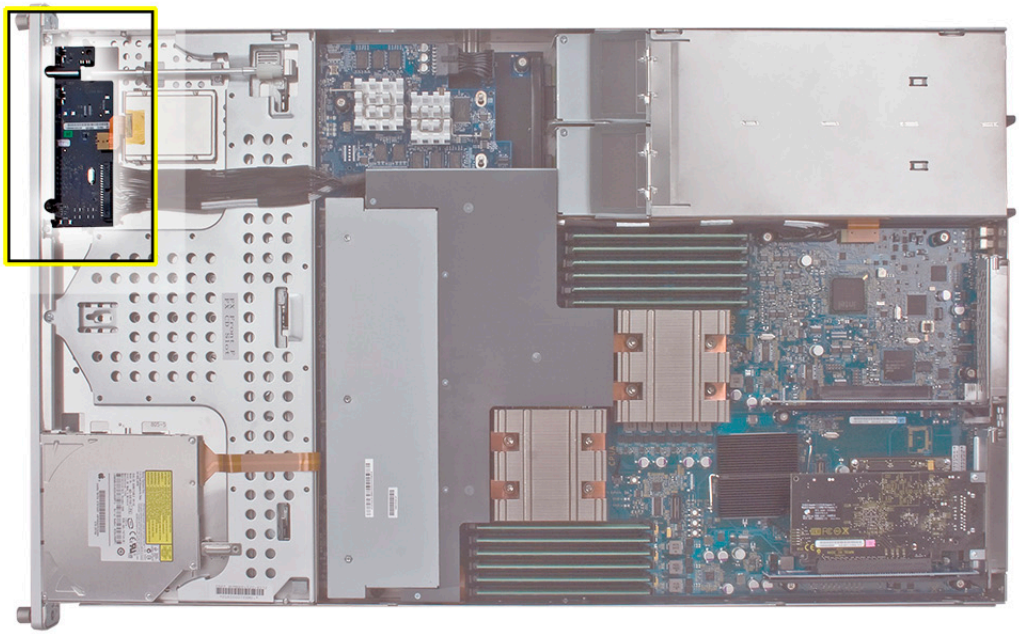
4 Replace the two front bezel brackets.

Front Panel Board

First Steps

Remove:

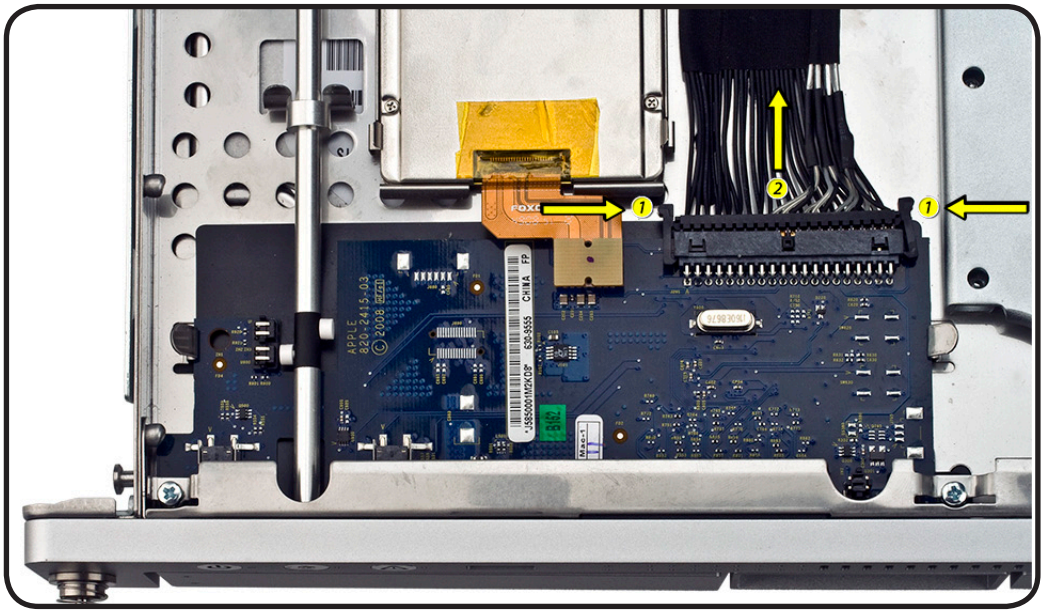
- Top Cover
- Locking Mechanism Rod
- Front Panel Board Cable
- Solid State Drive



Tools

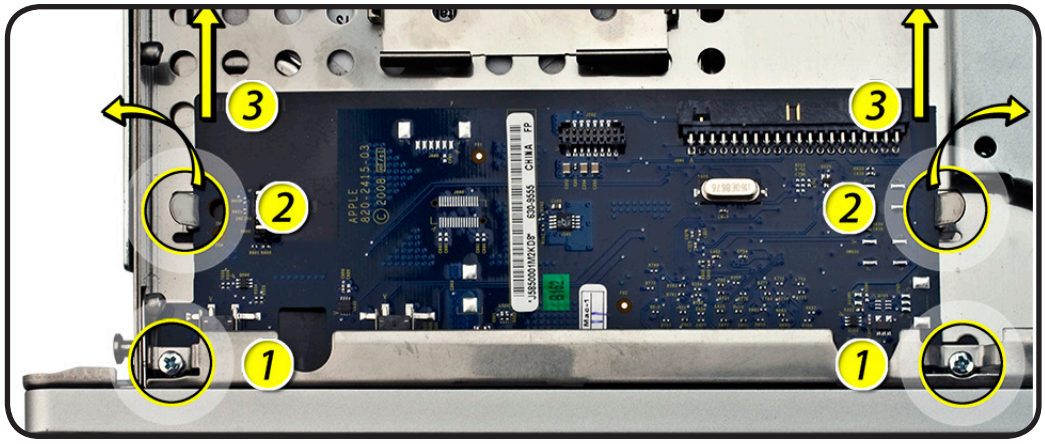
- ESD wrist strap and mat
- Phillips #1 screwdriver

Removal



1 Release the two locking levers on the connector and disconnect cable.

2 Remove the two 6-mm screws.



3 Slide the board back slightly and release the two clips on either side.

4 Tilt board up and remove.

Replacement

1 Tilt board up slightly and insert board into clips.

2 Slide board forward into front panel assembly.

3 Replace the two 6-mm screws and cable.

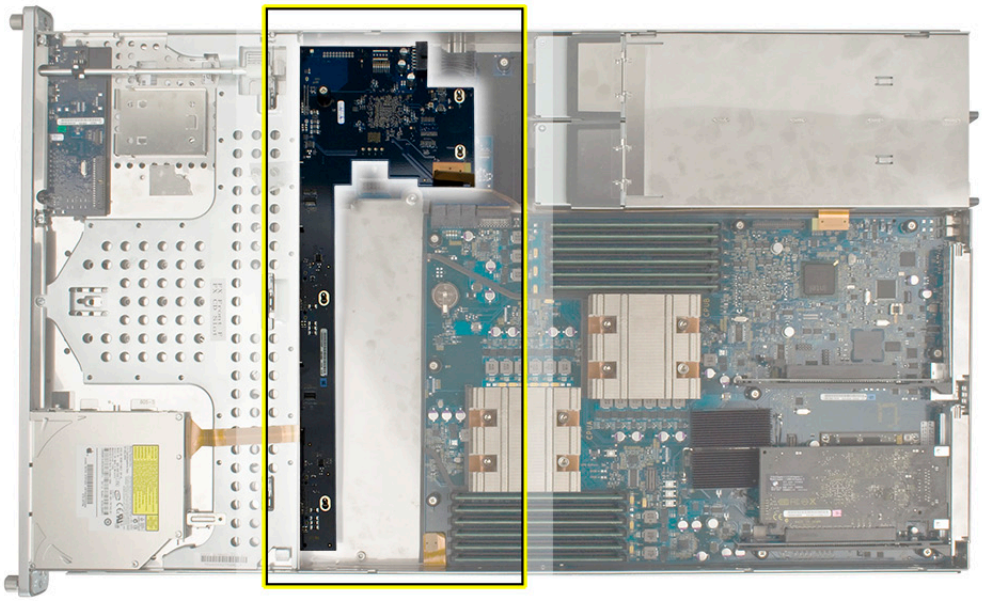
Drive Interconnect Backplane

First Steps

Remove:

- Apple Drive Module
- Power Supply
- Top Cover
- Airflow Duct
- Fan Array
- Power Distribution Cable

.



Tools

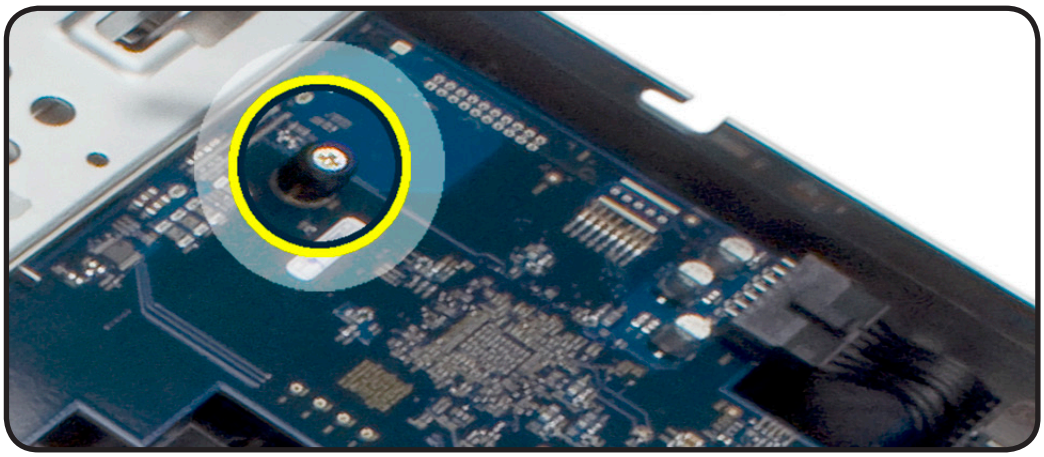
- ESD wrist strap and mat
- Phillips #2 screwdriver

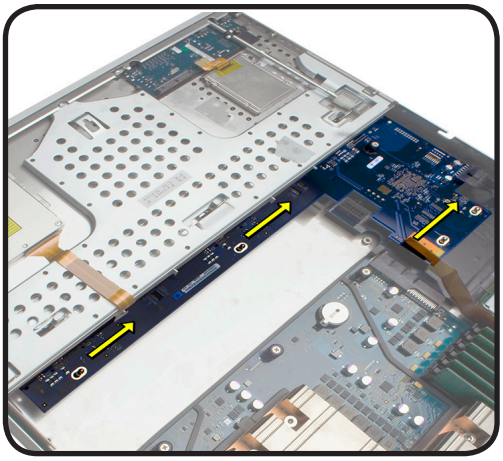
Removal

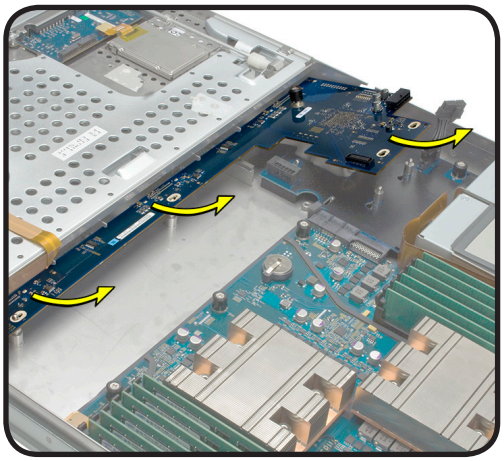
1 Loosen the captive thumbscrew.

2 Shift the backplane to the right (towards the enclosure) until it clears the stands.

3 Slightly tilt up the backplane toward the logic board.



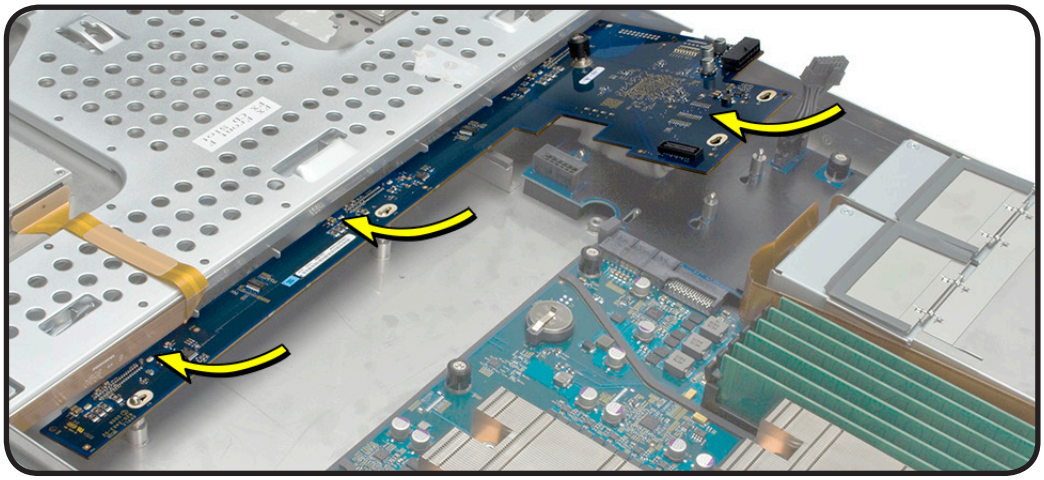




Removal Note: Do not let the backplane components come into contact with the standoffs or the enclosure as you remove the backplane.

Replacement

1 Lower the backplane into the enclosure at a slight angle.



Replacement Note: Do not let the backplane components come into contact with the standoffs or the enclosure as you remove the backplane.

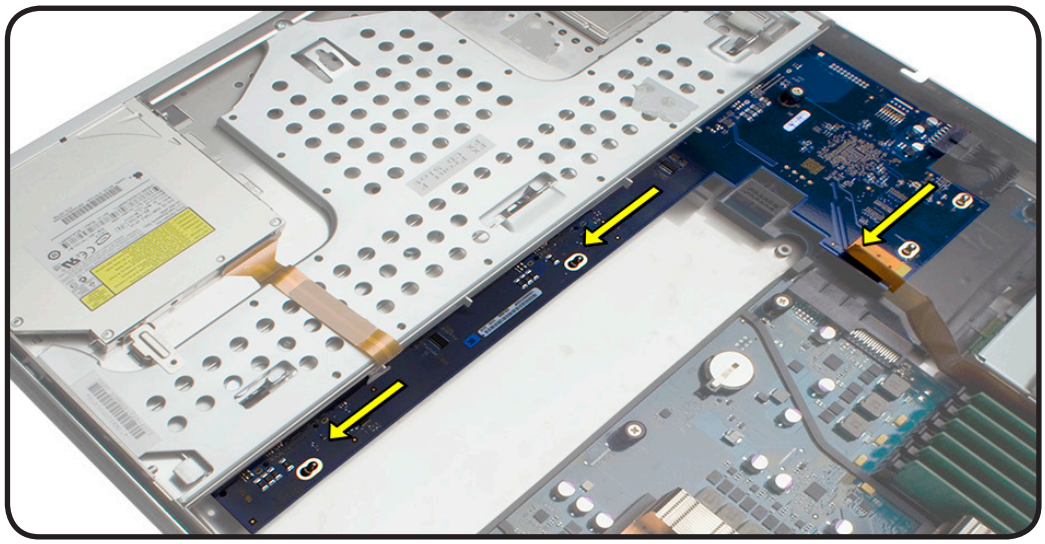
2 Rotate the backplane downward and over the four standoffs.

3 Slide the backplane in the direction shown to seat the backplane into enclosure.

4 Tighten the captive thumbscrew.

5 Connect the backplane-to-logic board cable. Verify cable is firmly seated.

6 Connect the front panel board cable to the front panel board.

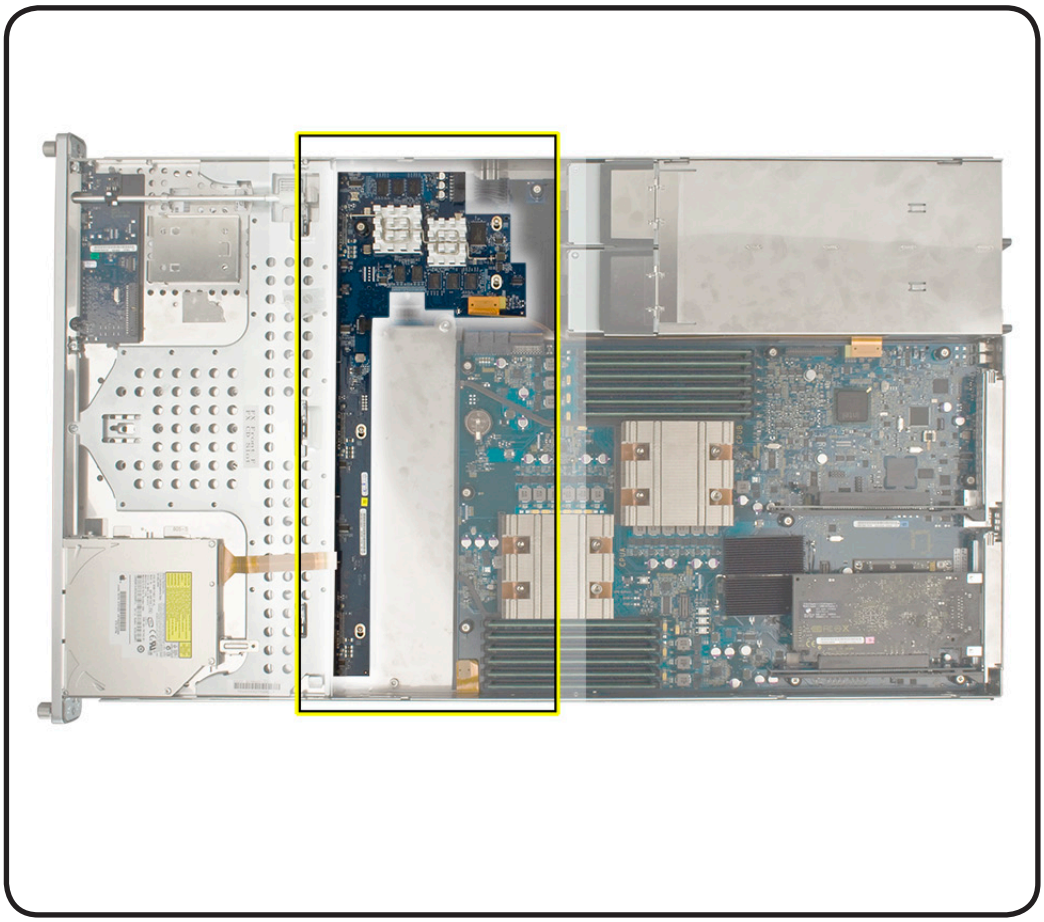


Xserve RAID Card

First Steps

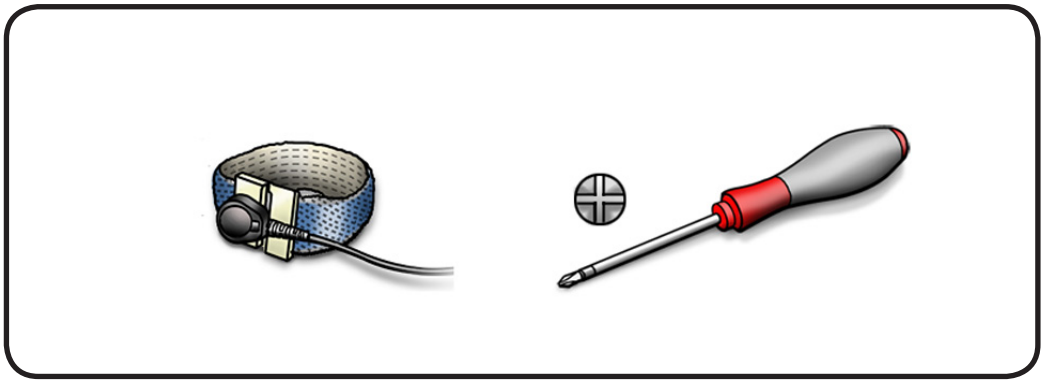
Remove:

- Apple Drive Module
- Power Supply
- Top Cover
- Airflow Duct
- Fan Array
- Power Distribution Board Cable
- Front Panel Board Cable
- Backplane-to-Logic Board Cable



Tools

- ESD wrist strap and mat
- Phillips #2 screwdriver



Removal

1 Remove power distribution cable from Xserve RAID Card.

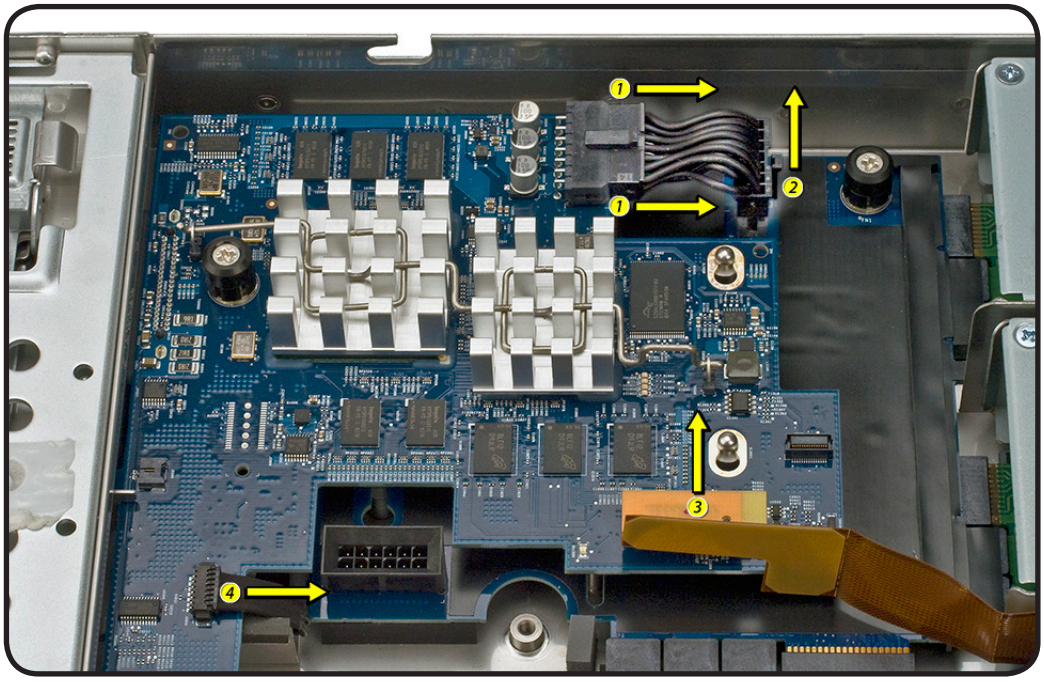
2 Disconnect the Backplane to Logic Board cable.

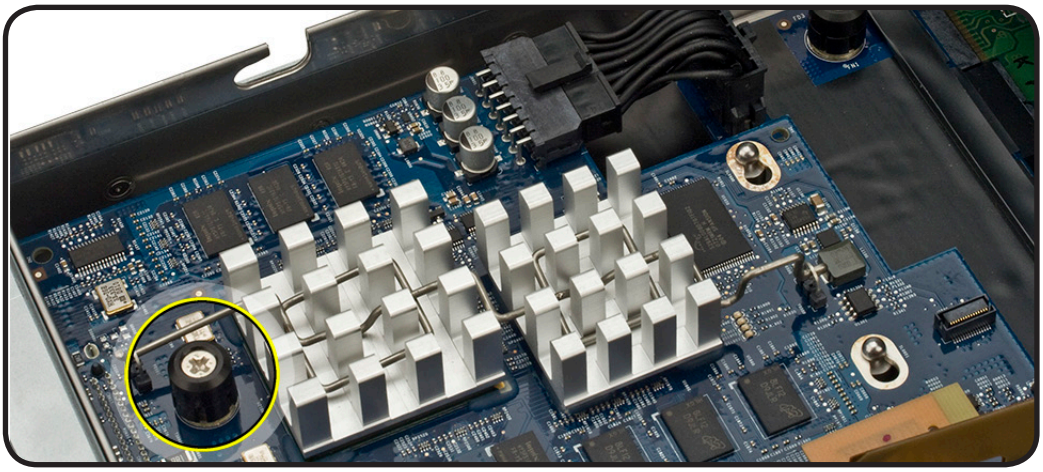
3 Disconnect the Xserve RAID Card battery cable from Xserve RAID Card.

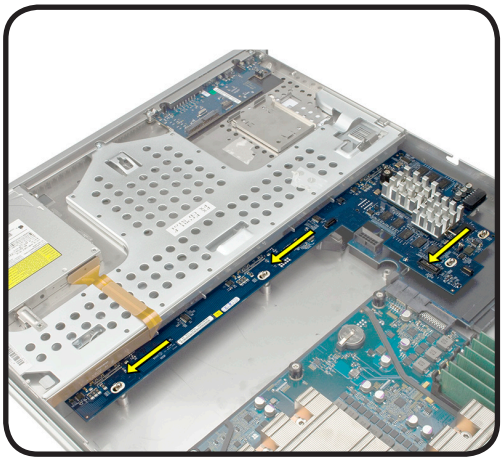
4 Loosen the captive thumbscrew.

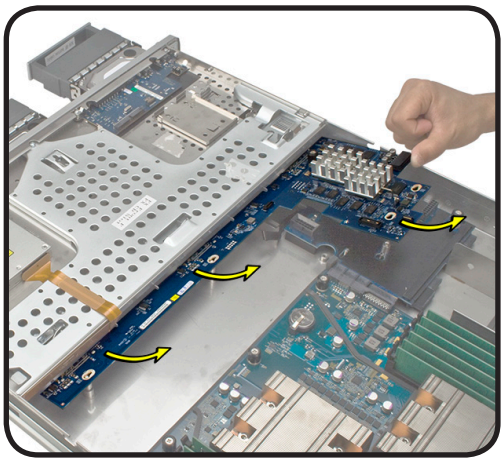
5 Shift the backplane to the right (towards the enclosure) until it clears the stands.

6 Slightly tilt up the backplane toward the logic board.





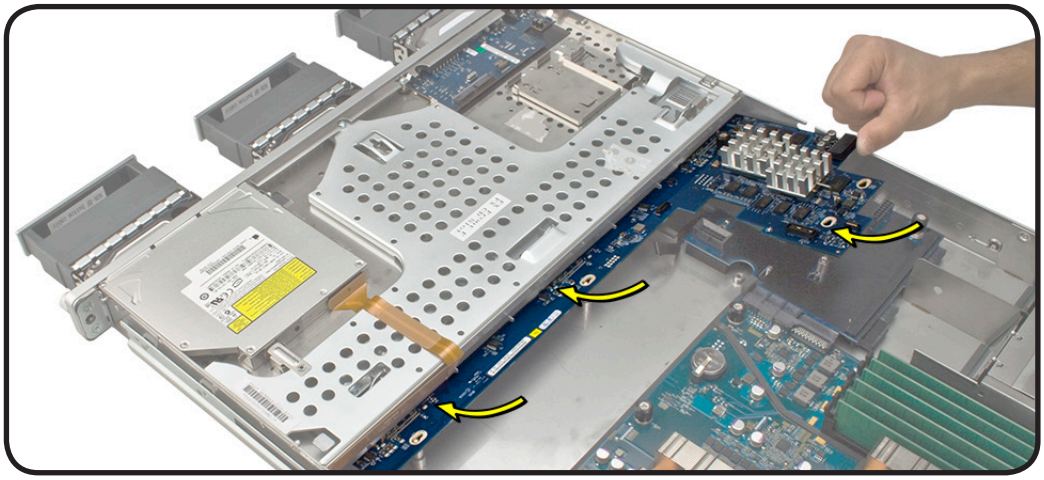




Removal Note: Do not let the RAID card components come into contact with the standoffs or the enclosure.

Replacement

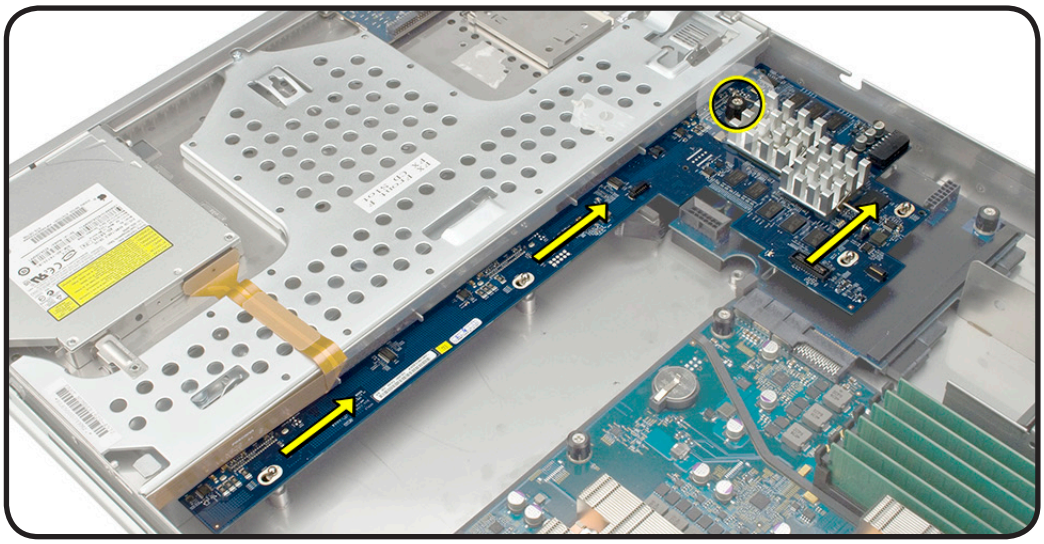
1 Lower the backplane into the enclosure at a slight angle.



Replacement Note: Do not let the RAID card components come into contact with the standoffs or the enclosure.

2 Rotate the backplane downward and over the four standoffs.

3 Slide the backplane to the right in the direction shown to seat the backplane into enclosure.



4 Tighten the captive thumbscrew.

5 Connect the backplane-to-logic board cable. Verify cable is firmly seated.

6 Connect the Xserve RAID card battery cable to the Xserve RAID card.

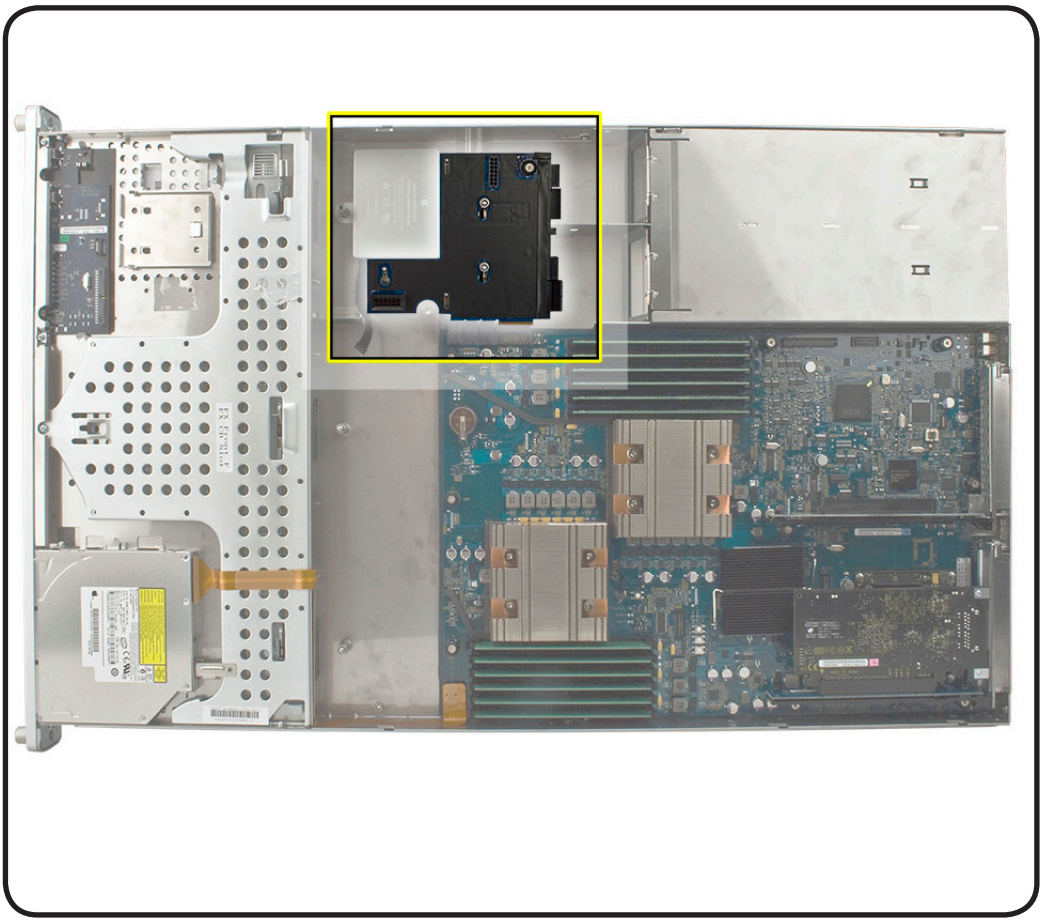
7 Connect the front panel board cable to the front panel board.

Power Distribution Board

First Steps

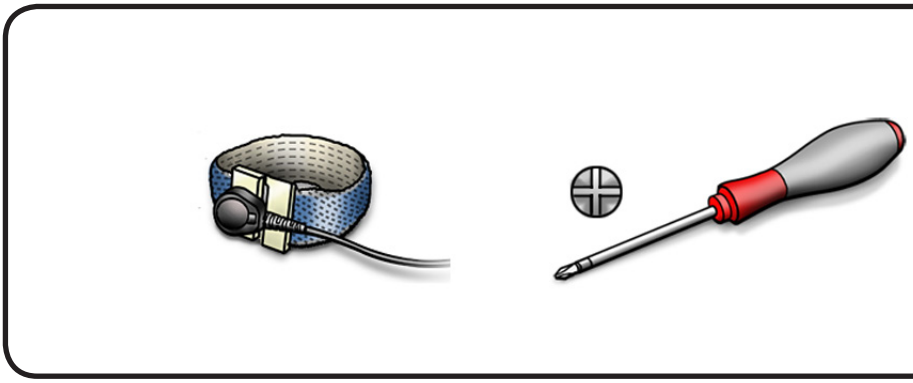
Remove:

- Apple Drive Module
- Power Supply
- Top Cover
- Airflow Duct
- Fan Array
- Drive Interconnect Backplane
- Power Distribution Board Cable

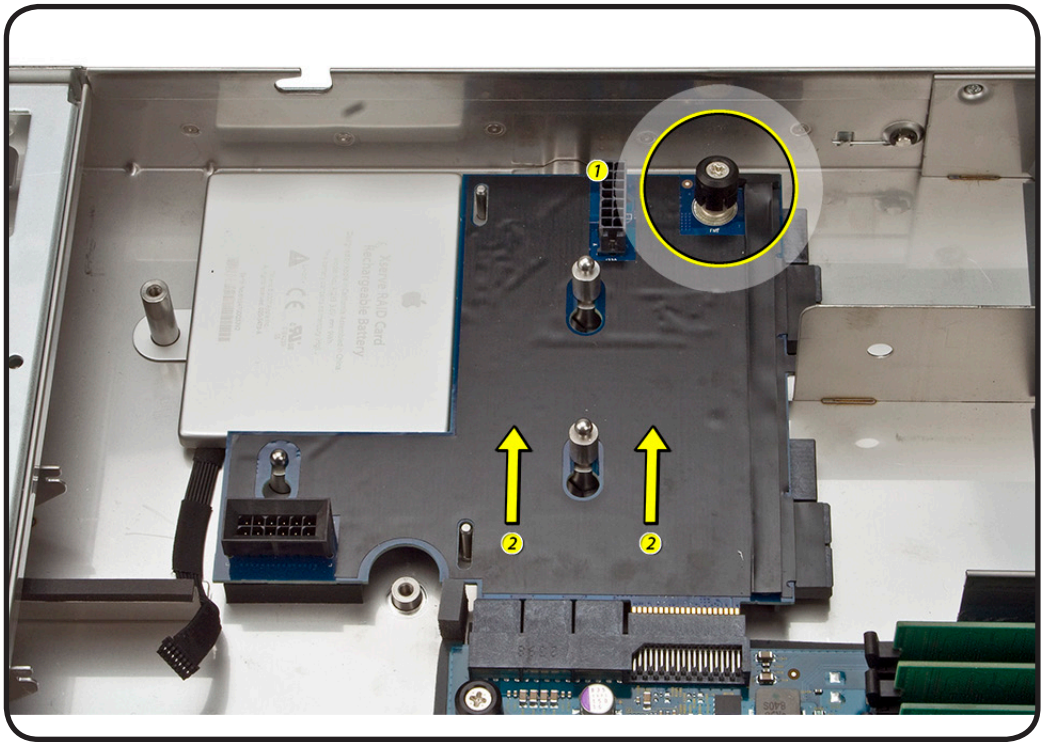


Tools

- ESD wrist strap and mat
- Phillips #2 screwdriver



Removal



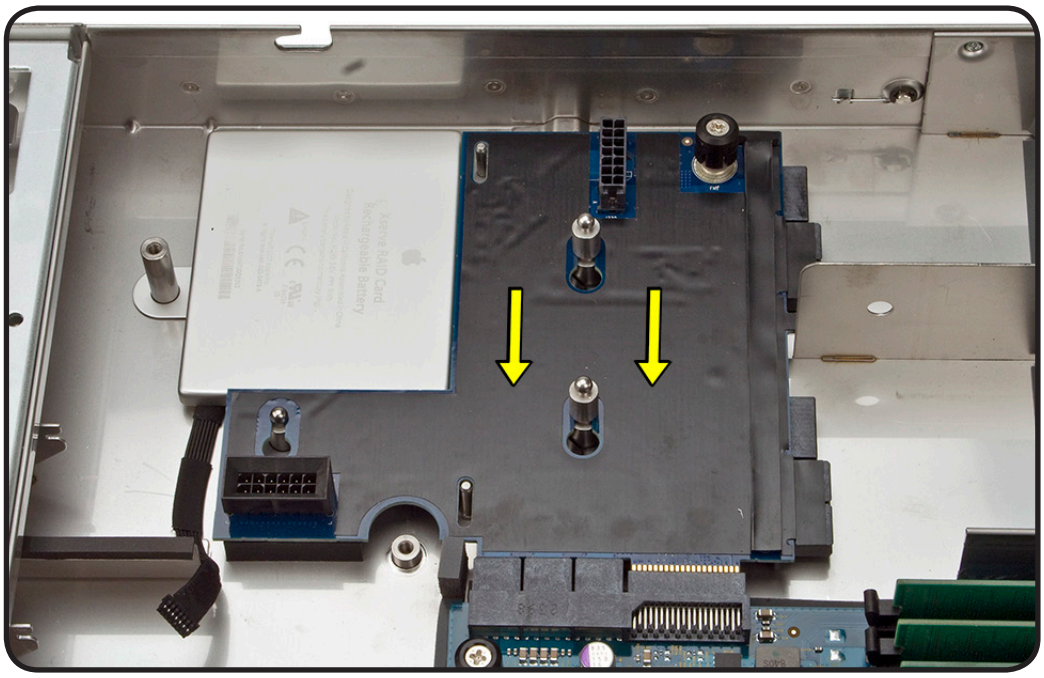
1 Release the captive thumbscrew that secures the power distribution board to the enclosure.

Removal Note: Captive thumbscrew may be tight, use the Phillips screwdriver to assist in removal.

2 Pull the board toward the left towards the enclosure in the direction shown.

3 Lift up the board and remove it from the enclosure.

Replacement



1 Lower the board into the enclosure.

2 Pull the board to the right to lock the board in place.

3 Tighten the captive thumbscrew to secure the board to the enclosure.

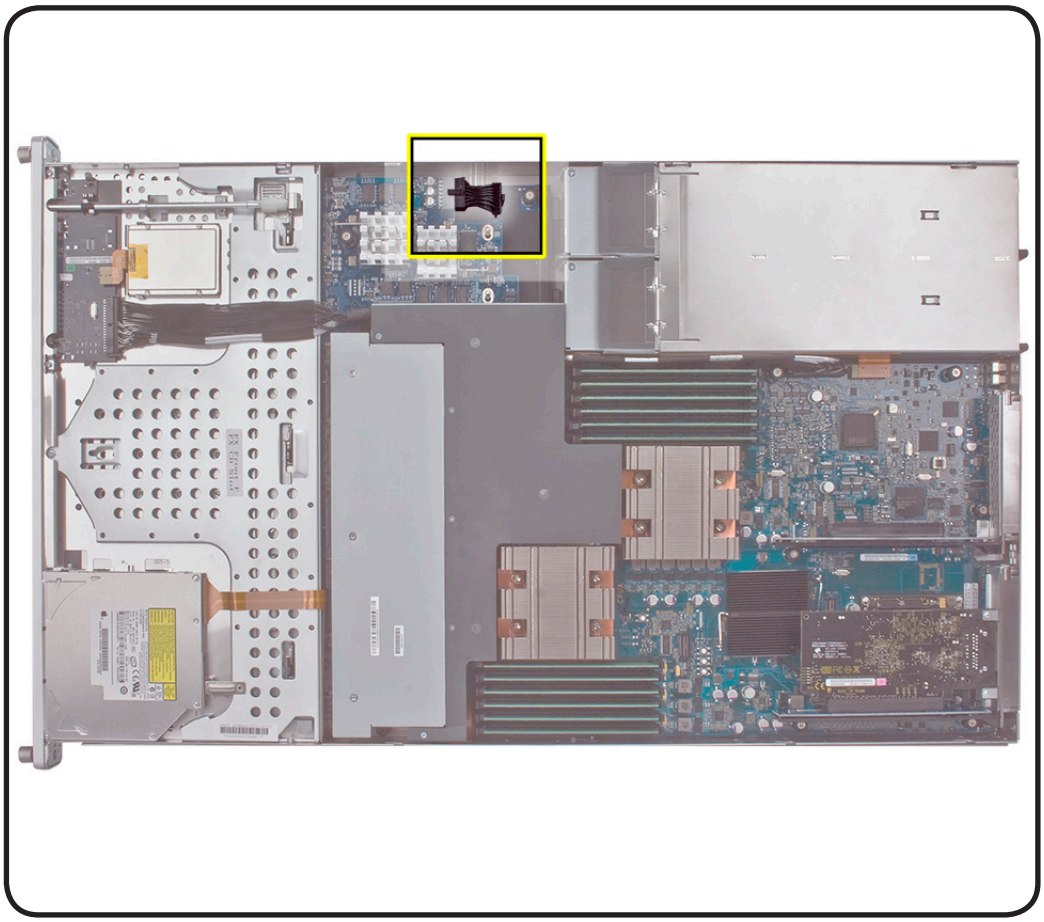
Power Distribution Board Cable

First Steps

Remove:

- Top Cover

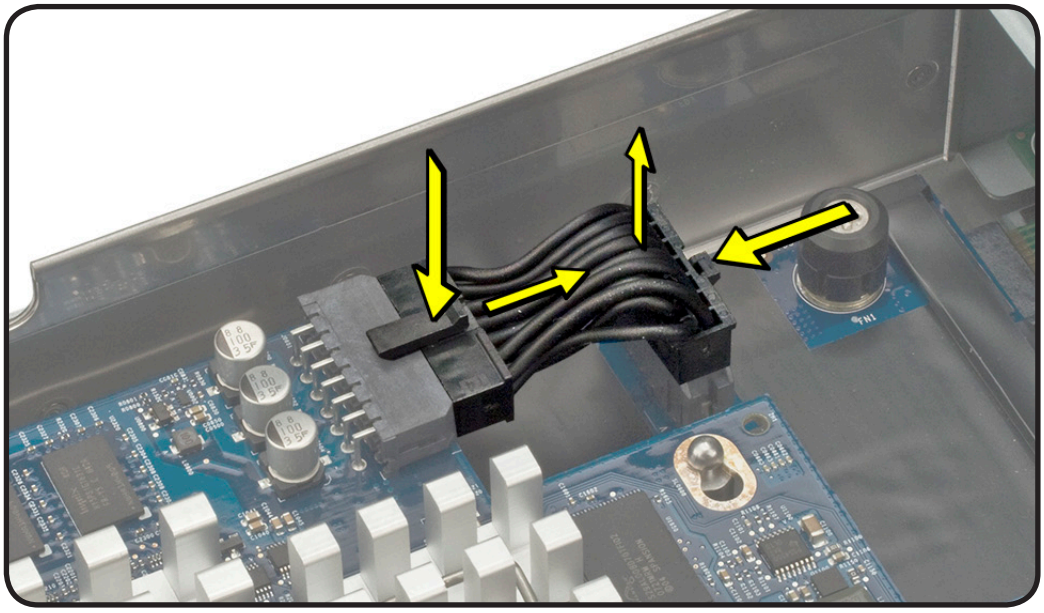
Caution: The power distribution board connectors are very tight and can be difficult to disconnect.. Use a nylon black stick to gently yet firmly pry outwards on the cable connector while depressing the latch with your thumb and forefinger.



Tools

- ESD wrist strap and mat
- Black stick

Removal



1. Disconnect the power distribution board cable on the drive interconnect backplane.
2. Disconnect the power distribution board cable from the power distribution board.
3. Remove from the Xserve.

Replacement

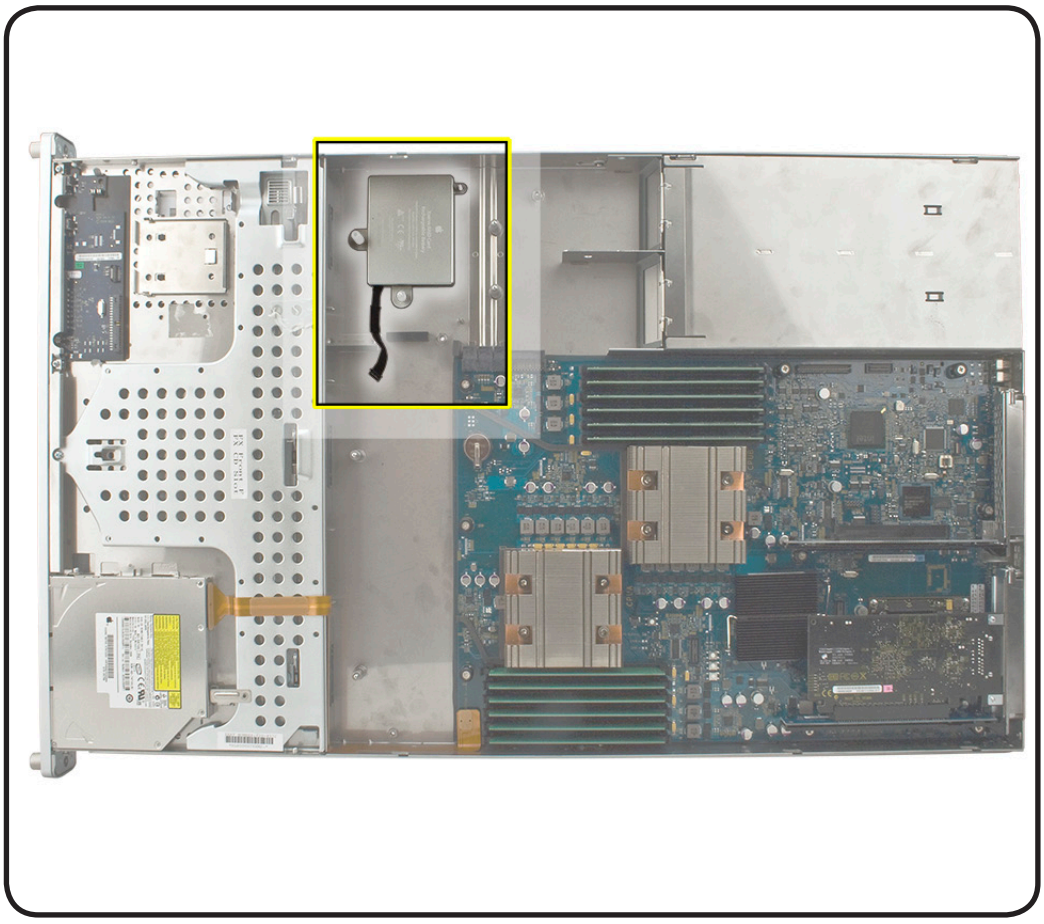
1. Connect the power distribution board cable to the power distribution board.
2. Connect the power distribution board cable to the drive interconnect backplane.

Xserve RAID Card Battery

First Steps

Remove:

- Apple Drive Module
- Power Supply
- Top Cover
- Airflow Duct
- Fan Array
- Power Distribution Board Cable
- Xserve RAID Card
- Power Distribution Board



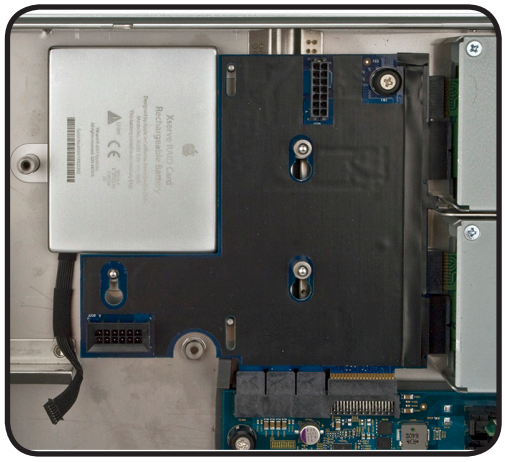
Tools

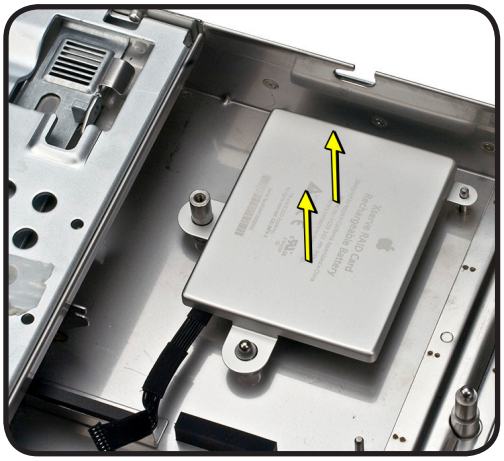
- ESD wrist strap and mat

Removal

1 Lift the Xserve RAID Card battery straight up off its three mounting posts.

2 Remove the battery from the enclosure.



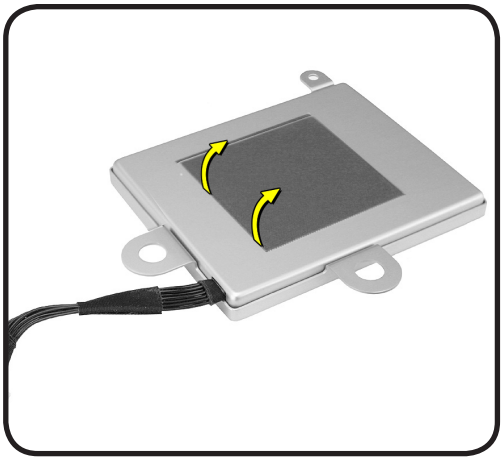


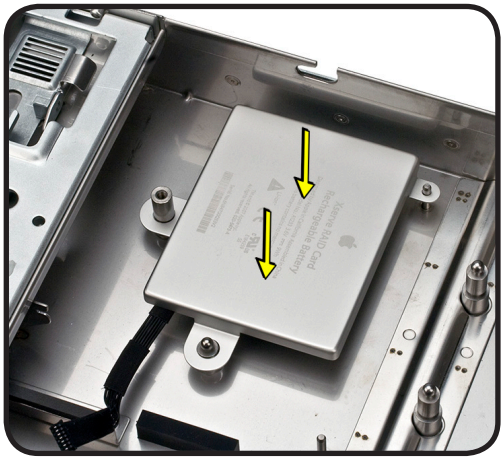
Removal Note: Adhesive on the underside of the battery holds it in place on the enclosure floor.

Replacement

1 Remove the protective film covering the adhesive on the underside of battery.

2 Lower the battery into place on its three mounting posts.





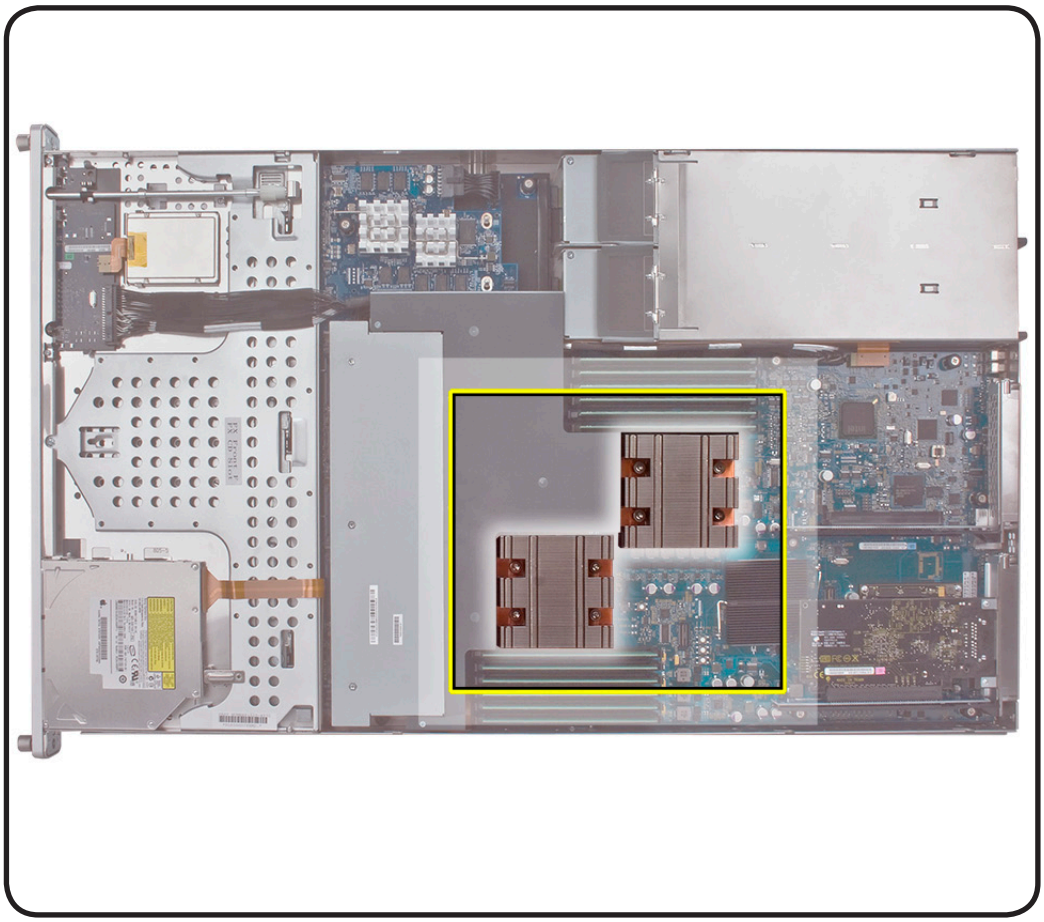
Important: Do not drop, disassemble, crush, incinerate, or expose the battery to temperatures above 212° F (100° C). Stop using the battery if it appears damaged in anyway. Replace the battery only with an Apple-authorized battery for this product. Dispose of used batteries promptly according to your local environmental guidelines.

Processor Heat Sink

First Steps

Remove:

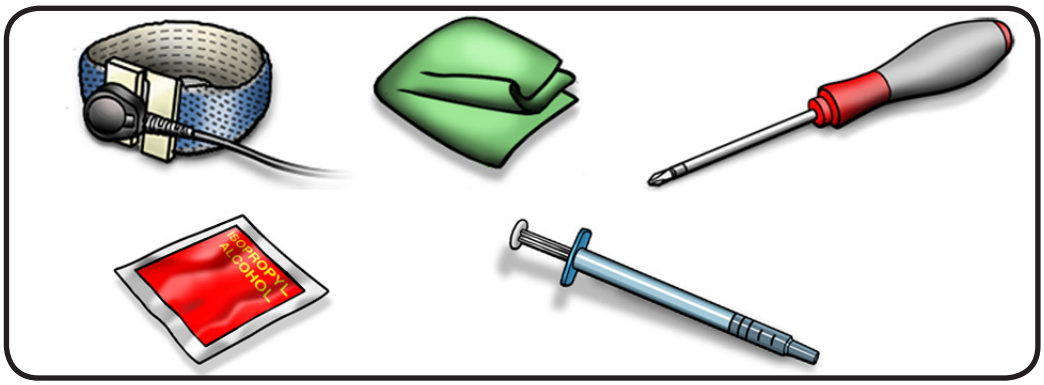
- Top Cover
- Airflow Duct



Note: The thermal bond between the processor and heat sink requires thermal grease. You must replace the thermal grease every time your remove the processor and processor heat sink.

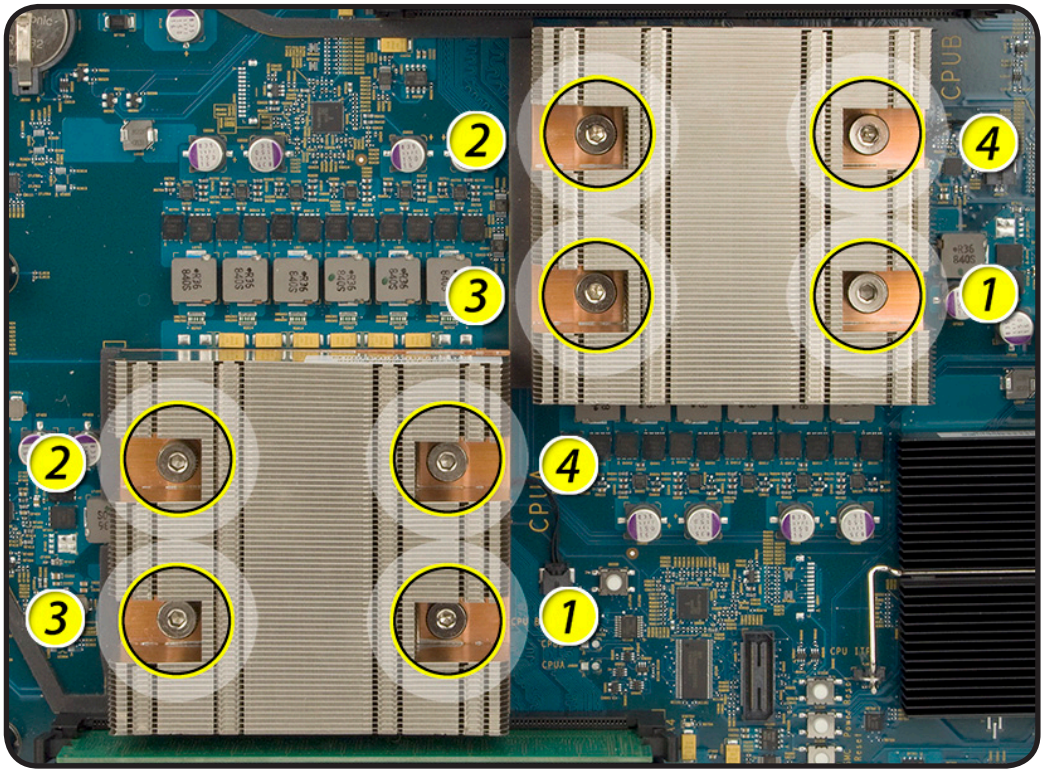
Tools

- ESD wrist strap and mat
- Alcohol wipes
- Thermal grease
- 3-mm Hex wrench

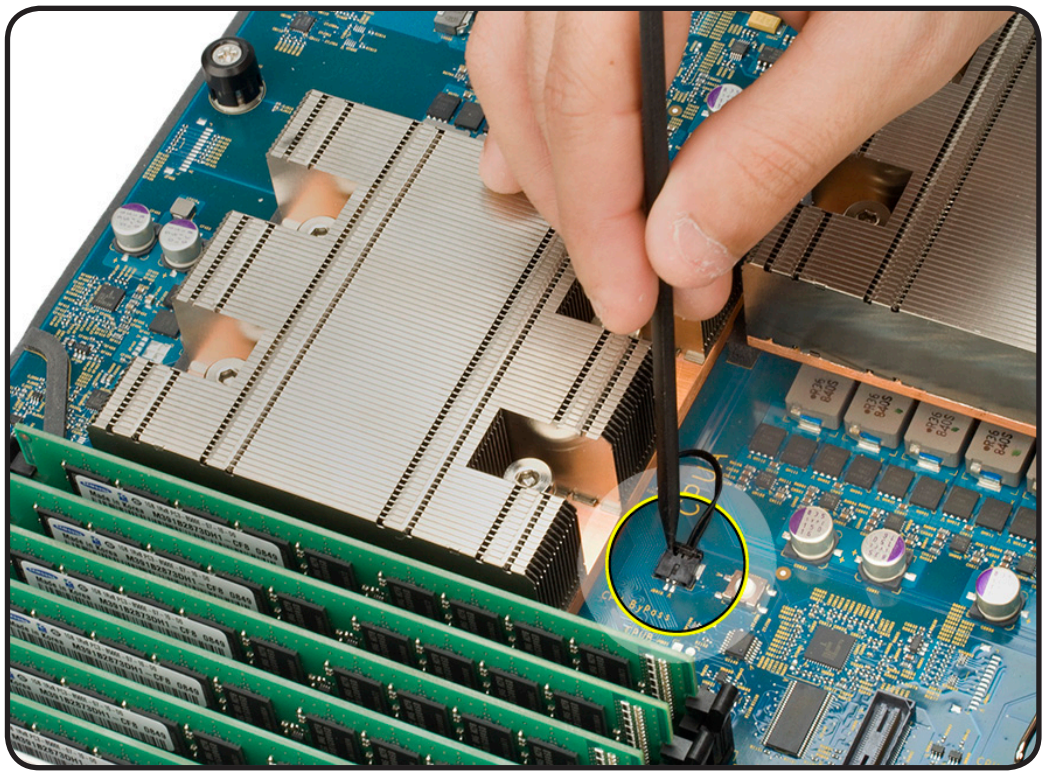


Removal

1 Loosen the four captive screws securing the heat sink to the processor.

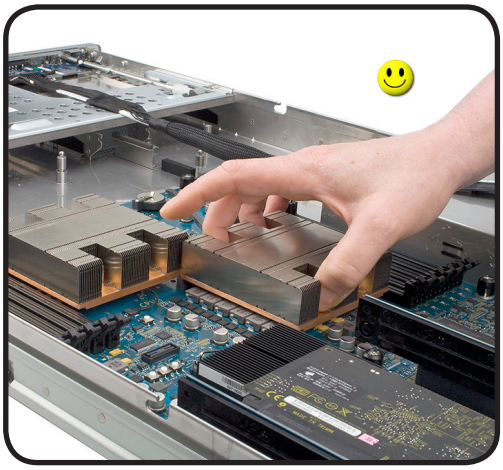


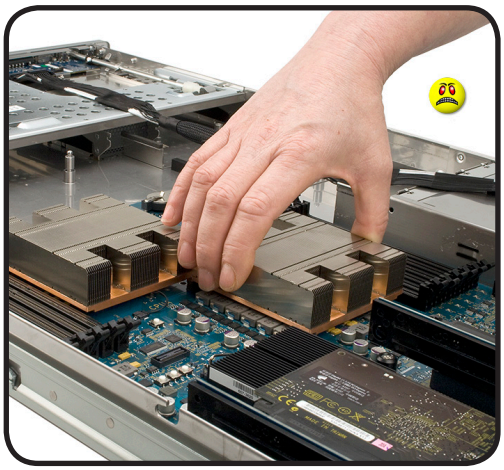
Caution: Each heat sink is connected to the logic board by a small 2-pin thermal sensor cable. Lifting the heat sink too quickly can damage the cable or connector. Because of the tight thermal bond between the processor and the heat sink, be cautious when removing. Do not pull on the cable as you lift the heat sink.



2 Pull the connector, not the cable, to disconnect the sensor cable from the logic board.

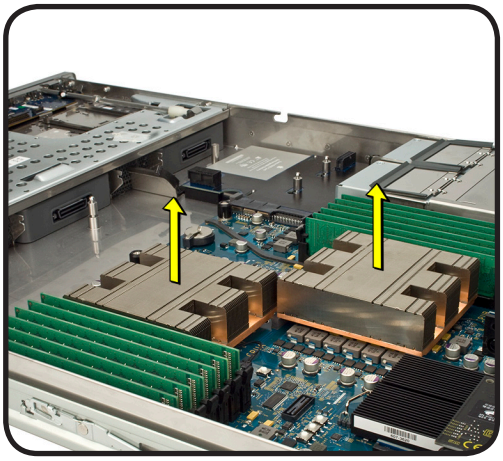
3 Handle the heat sink from the side slotted sides, not the smooth sides. Grasping from the smooth sides can compress the ribs causing permanent damage.

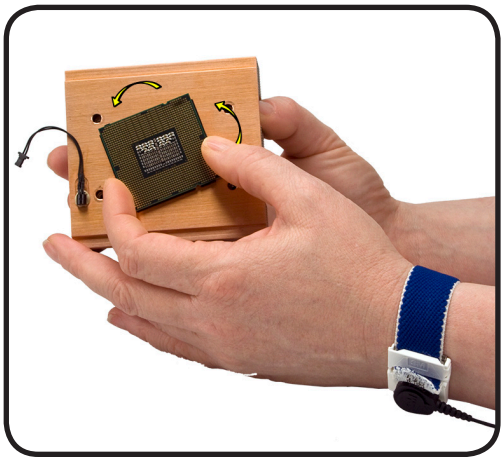




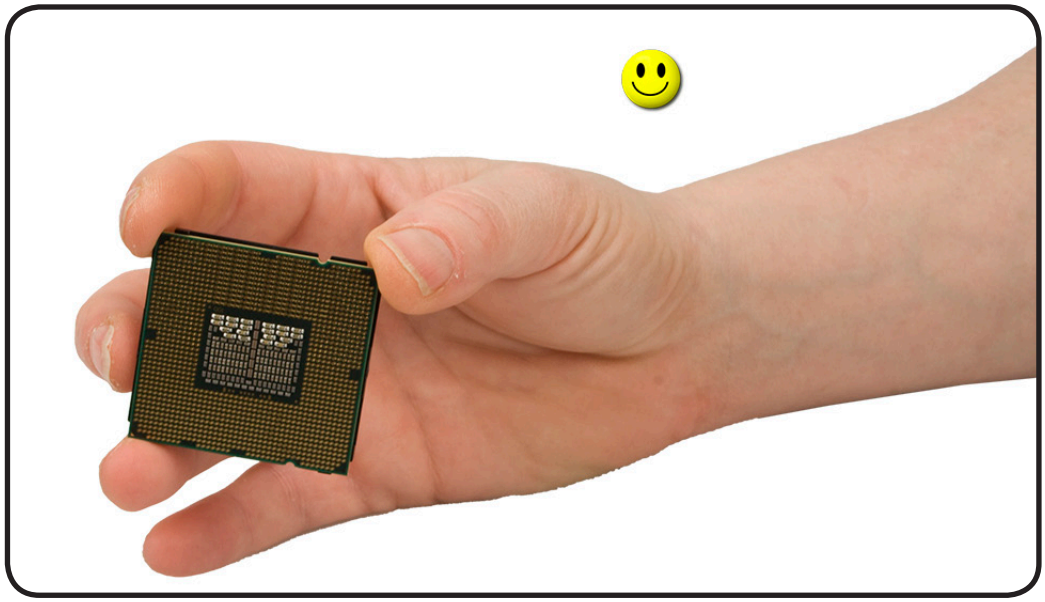
4 Lift the heat sink straight up and out of the enclosure.

5 Gently twist the processor and heat sink in opposite directions.





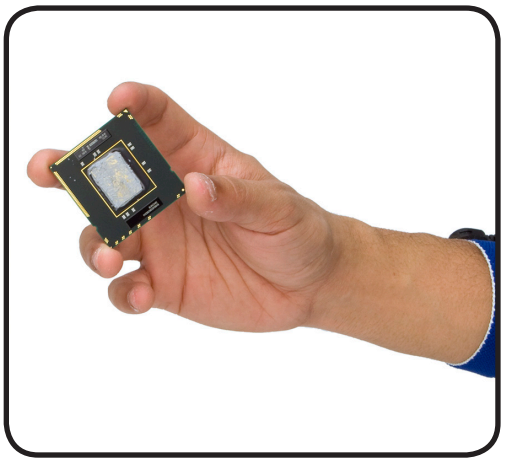
Important: Hold the processor by three corners when removing or replacing the processor. Do not touch the gold pins on the processor or processor socket on the logic board.



Replacement

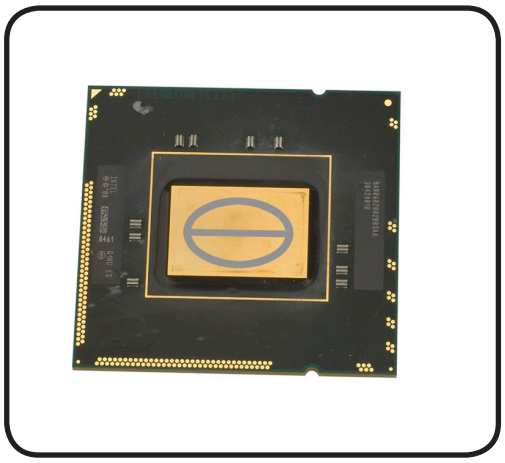
Important: The thermal bond between the processor and heat sink requires thermal grease for proper operation. You must replace the thermal grease on the processor each time you remove or replace the heat sink. Clean the processor and apply new grease as follows

1 Always hold the processor by three corners.

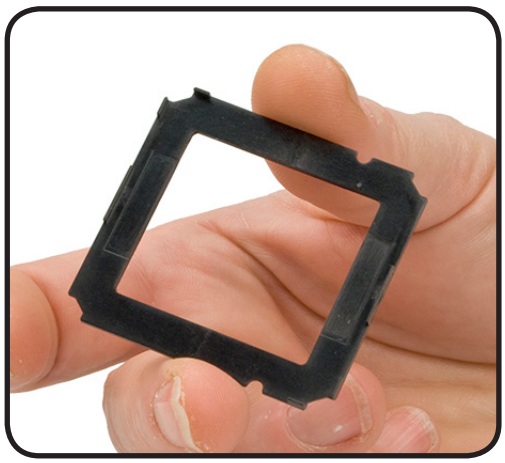


2 Clean off any existing thermal grease on the heat sink and processor using alcohol wipes provided with the replacement part.

3 Using the syringe, apply 0.1 cc of thermal grease to the top surface of the processor.



4 Do not apply more grease than recommended. Do not allow grease to come in contact with processor frame or processor connectors.



5 Reinstall processor and processor frame.

6 Replace heat sink and secure heat sink connector to logic board.

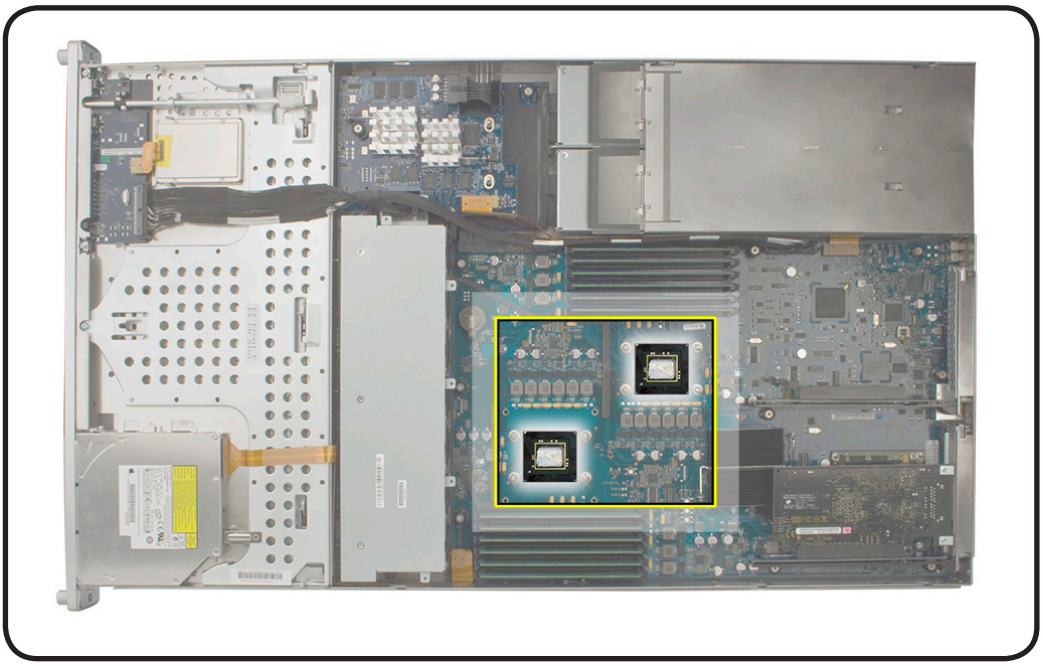
Important: Be sure not to get any grease anywhere on the processor other than the very top, flat surface that directly contacts the heat sink

Processor

First Steps

Remove:

- Top Cover
- Airflow Duct
- Processor Heat Sink



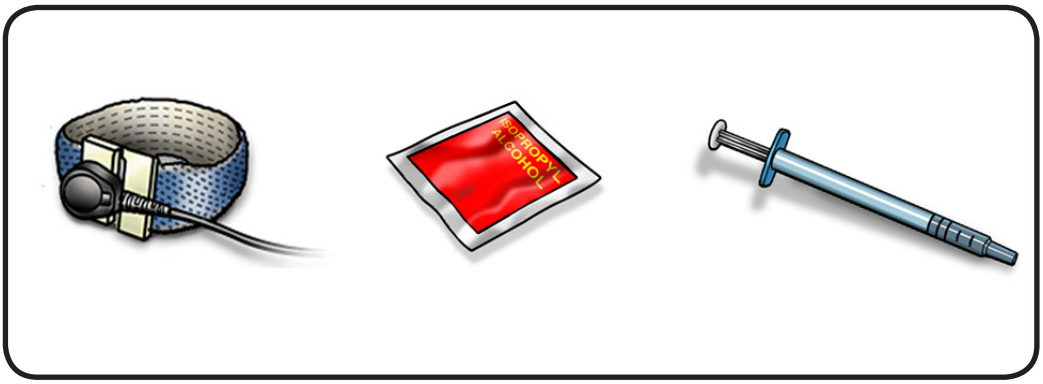
Note: This procedure applies to the Xserve (Early 2009) single and dual-processor configurations.

Important: Xserve (Early 2009) requires thermal grease for proper operation. Every time you remove a processor heat sink, you must replace the grease on the underside of the heat sink. See procedure "Processor Heat Sink." New grease and alcohol wipes for cleaning off the previous grease are included with replacement heat sinks, processors.

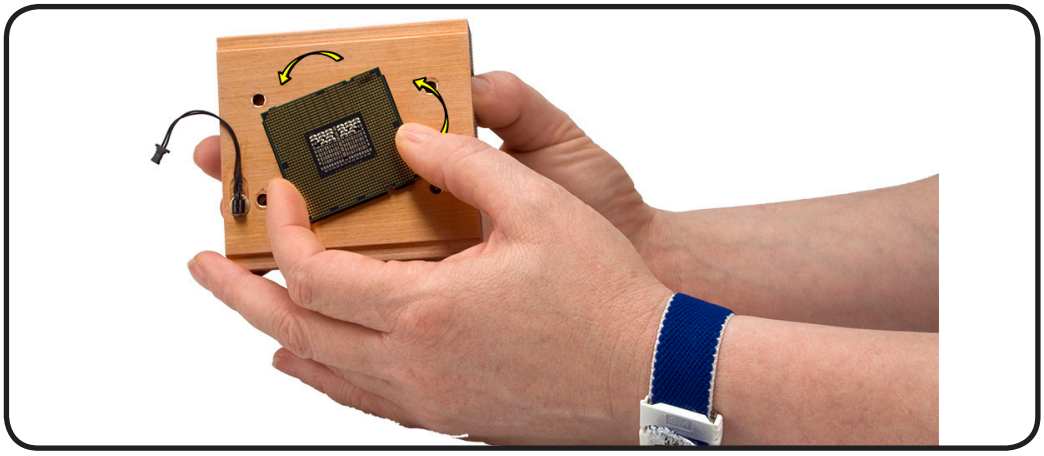
Note: The thermal bond between the processor and heat sink requires thermal grease. You must replace the thermal grease every time your remove the processor heat sink

Tools

- ESD wrist strap and mat
- Alcohol wipe
- Thermal grease
- CPU socket cover

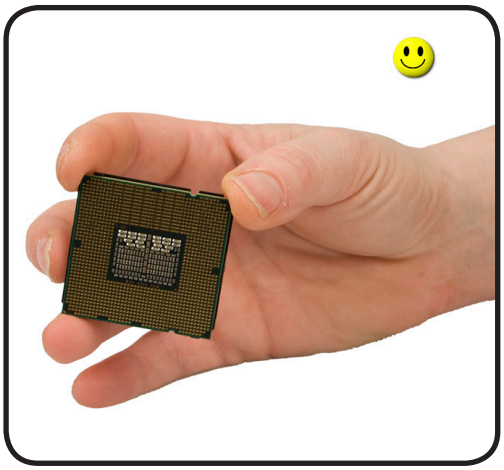


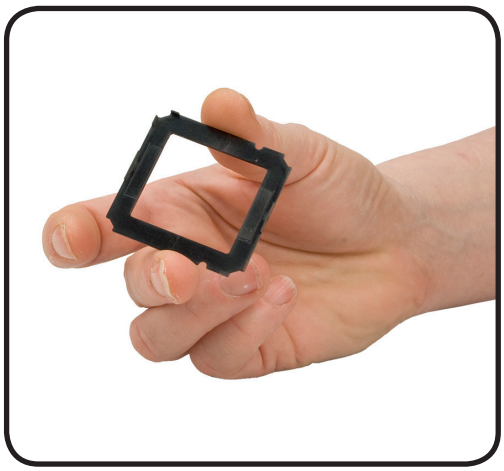
Removal



1 Carefully remove the processor from the heat sink by twisting the heat sink and processor in opposite directions.

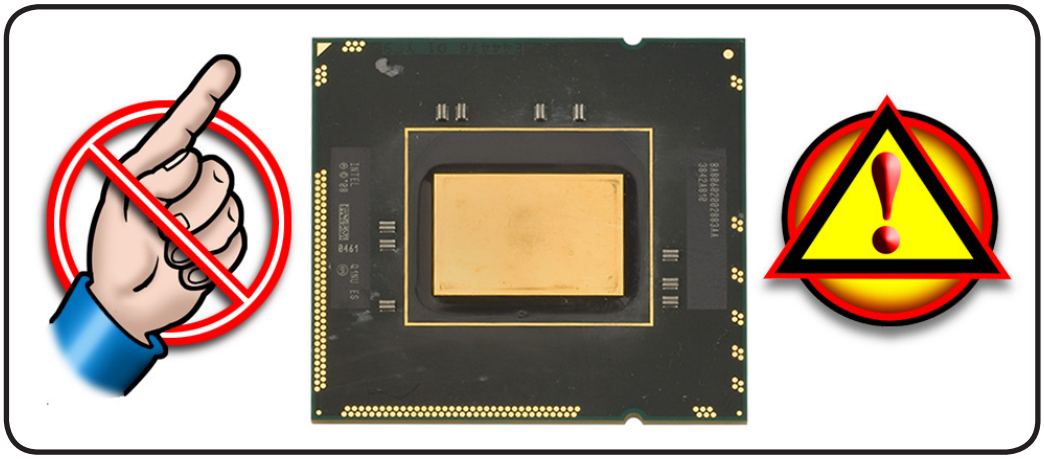
Important: Place the CPU socket cover over the processor slot on the logic board after processor is removed.





2 Hold the processor by the three corners. Be extremely careful not to touch the gold pins on the bottom of the processor.

3 Gently remove the processor bracket from the processor.

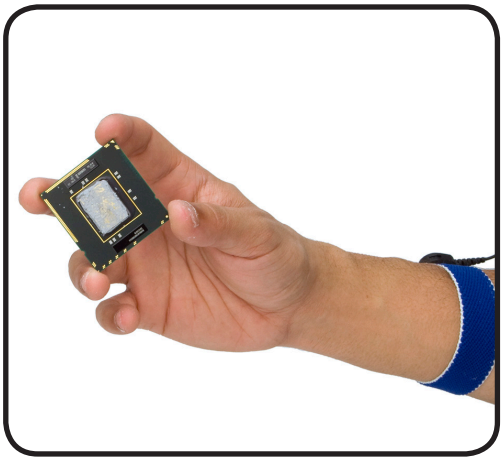


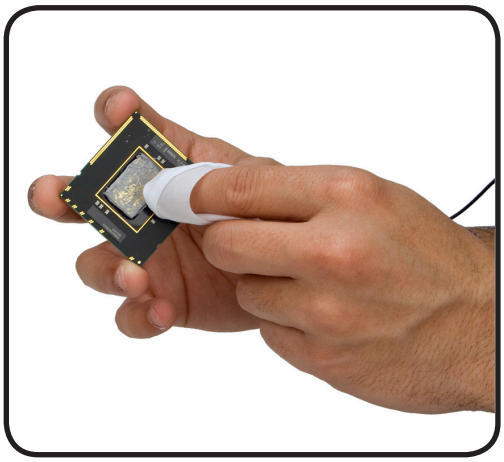
Important: Do not touch components on processor top or bottom. Hold processor only by the edges.

Also be careful not to touch gold pins in processor socket.

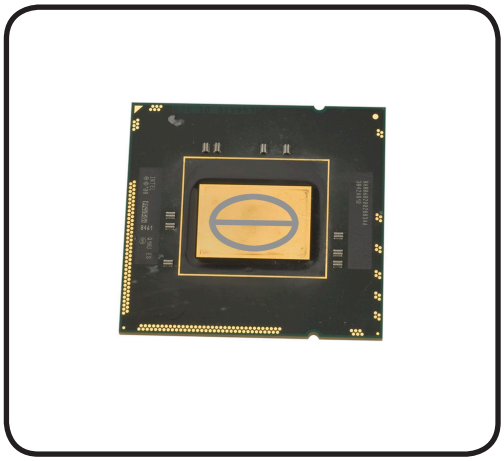
Replacement

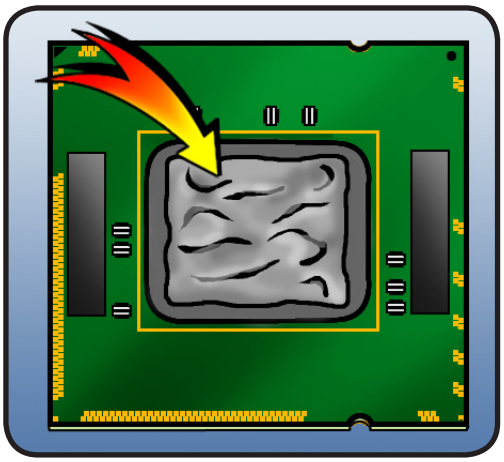
Important: Do steps 1–3 with processor REMOVED from logic board.





1 Using alcohol pad included with heat sink or processor, replacement part, clean off used thermal grease from bottom of heat sink and top of processor.

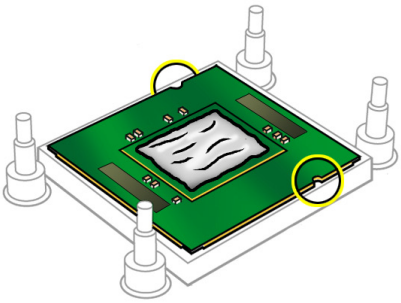




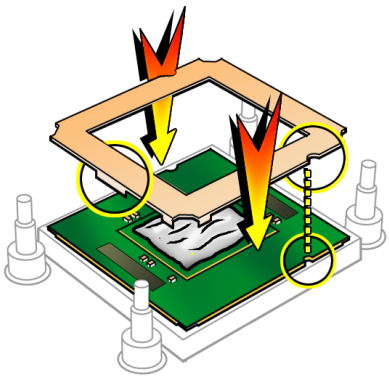
2 Using syringe of thermal grease, apply narrow bead of grease to processor chip (raised square on top of processor). Apply in pattern illustrated.

Warning: Do not apply more grease than recommended. Also do not allow grease to come in contact with processor frame. Grease must not overflow into processor connector.

4 Place processor in connector, aligning notches.



5 Place frame over processor, aligning notches and making sure tabbed edge of frame faces down.



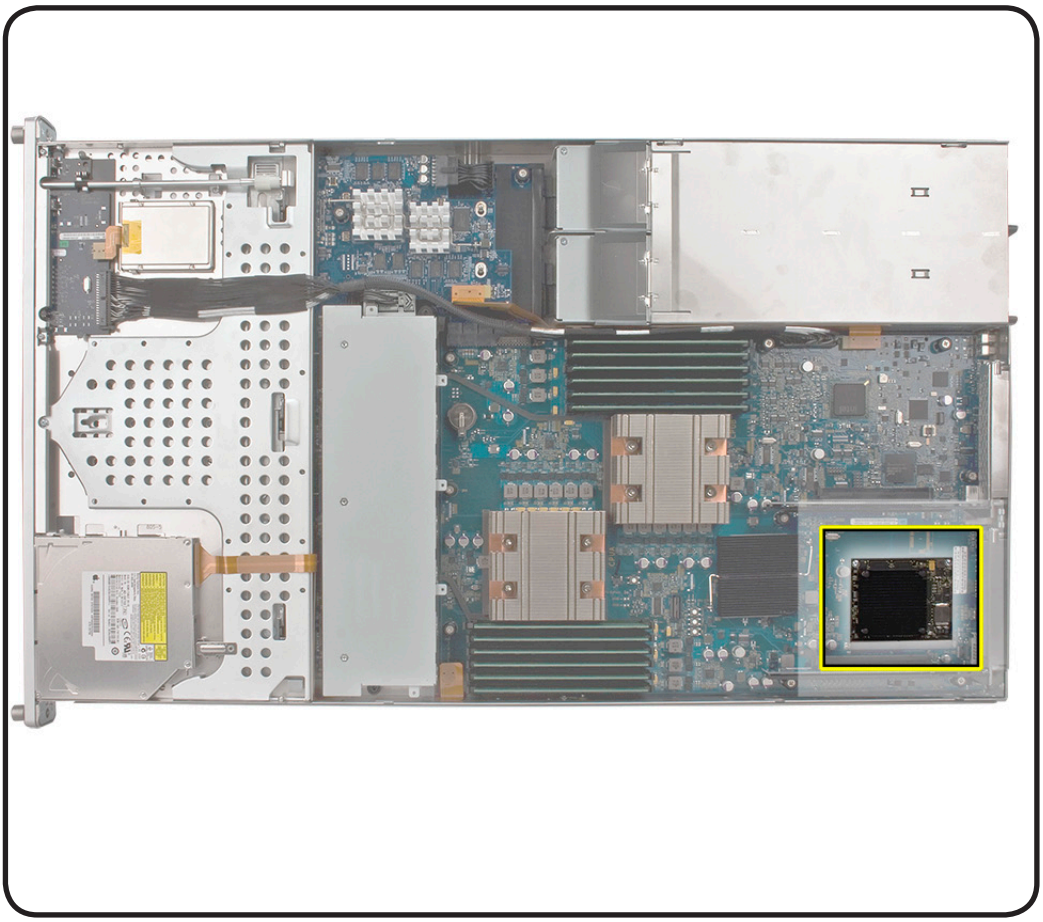
6 Replace the **Processor Heat Sinks**.

Video Mezzanine Card

First Steps

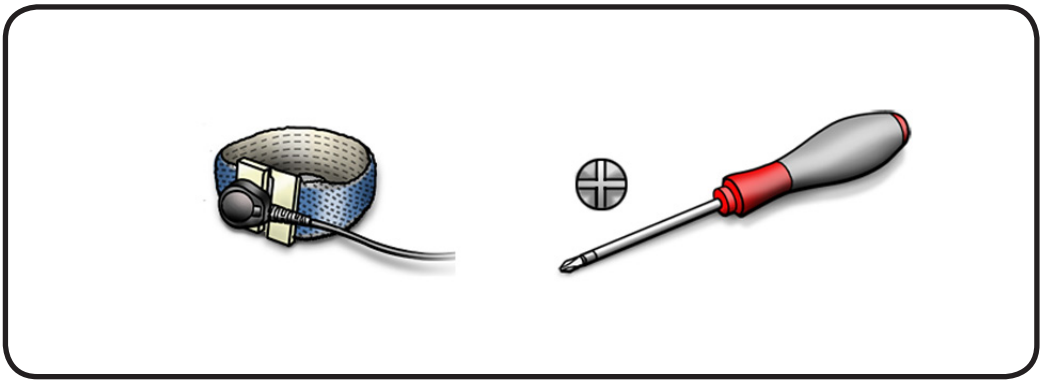
Remove:

- Top Cover
- PCI-E Riser Cards
- PCI-E Expansion Cards



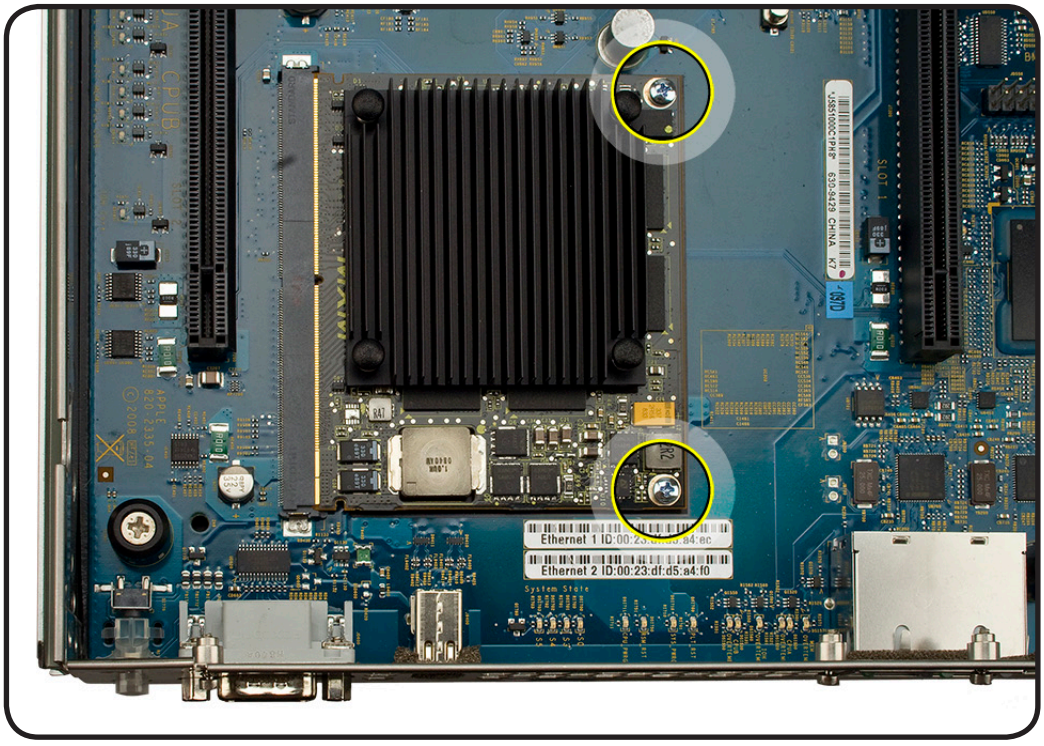
Tools

- ESD wrist strap and mat
- Phillips #1 screwdriver



Removal

1 Remove the two Phillip screws that fasten the mezzanine card to the logic board.

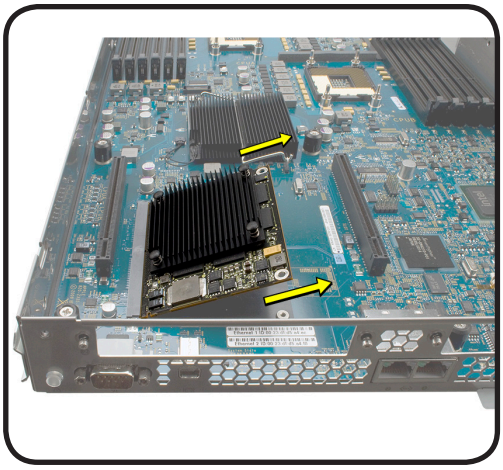


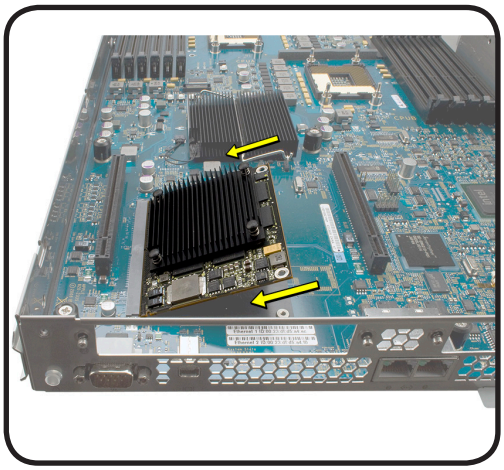
2 The card will pop up at a 45-degree angle.

3 Hold the mezzanine card by the edges.

4 Gently pull the card out of the socket.

Replacement





1 Hold the mezzanine card by the edges.

2 Gently slide the mezzanine card into the socket at a 45-degree angle.

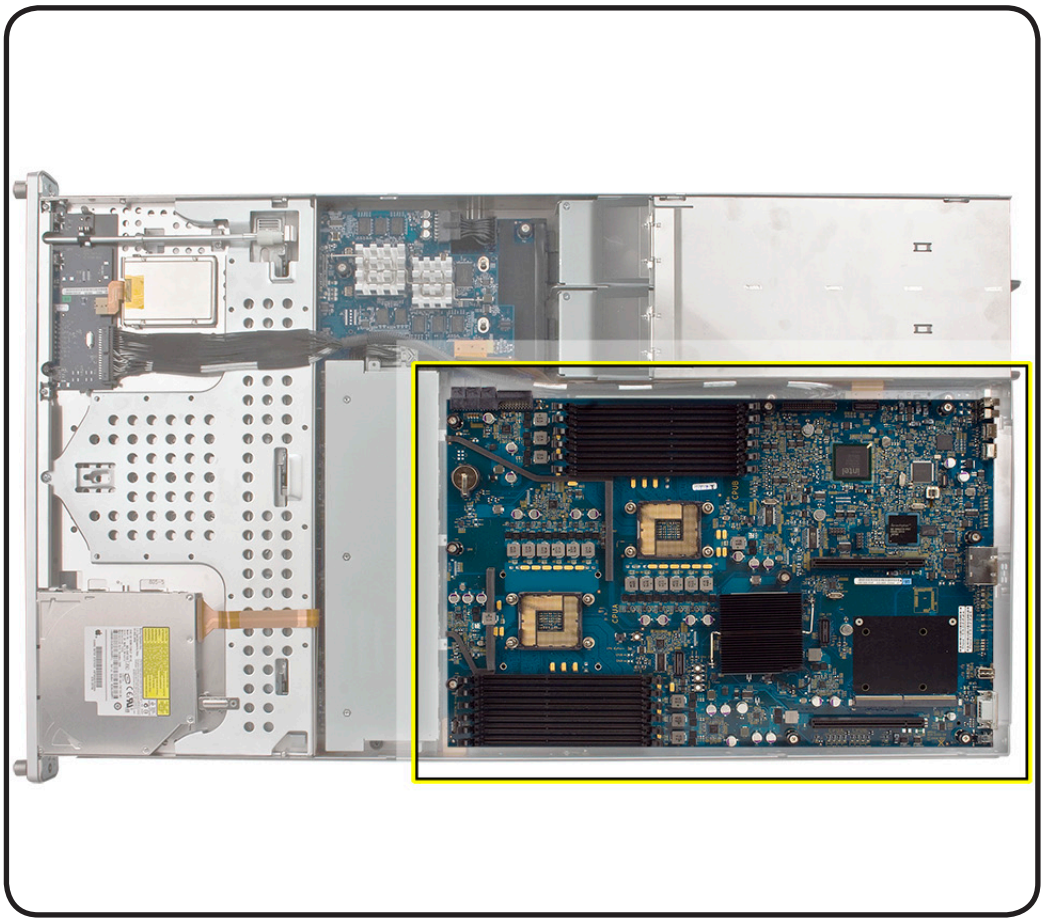
3 Gently press the mezzanine card down and secure the two Phillips screws to the logic board.

Logic Board

First Steps

Remove:

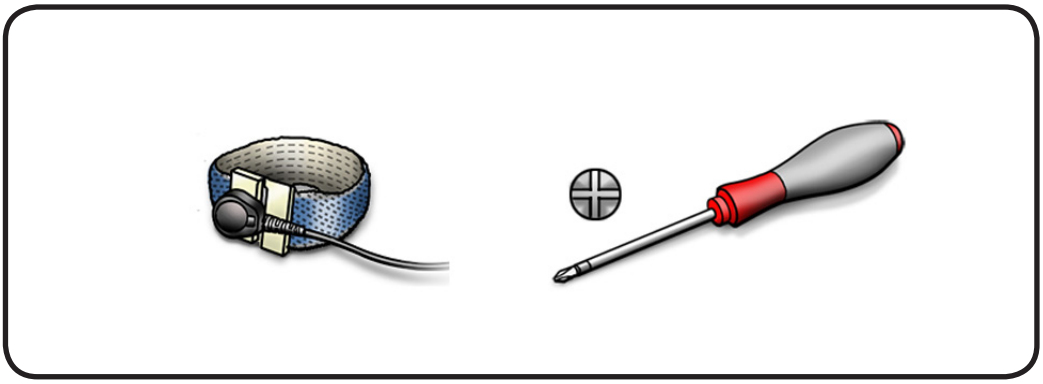
- Apple Drive Module
- Power Supply
- Top Cover
- PCI-E Riser Cards
- PCI-E Expansion Cards
- Memory
- Airflow Duct
- Fan Array
- Backplane-to-Logic Board I/O Cable
- Processor Heat Sink
- Processor
- Video Mezzanine Card



Caution: Do not flex the logic board or handle it by its components or heat sinks. Always grasp the logic board by its thumbscrews or edges.

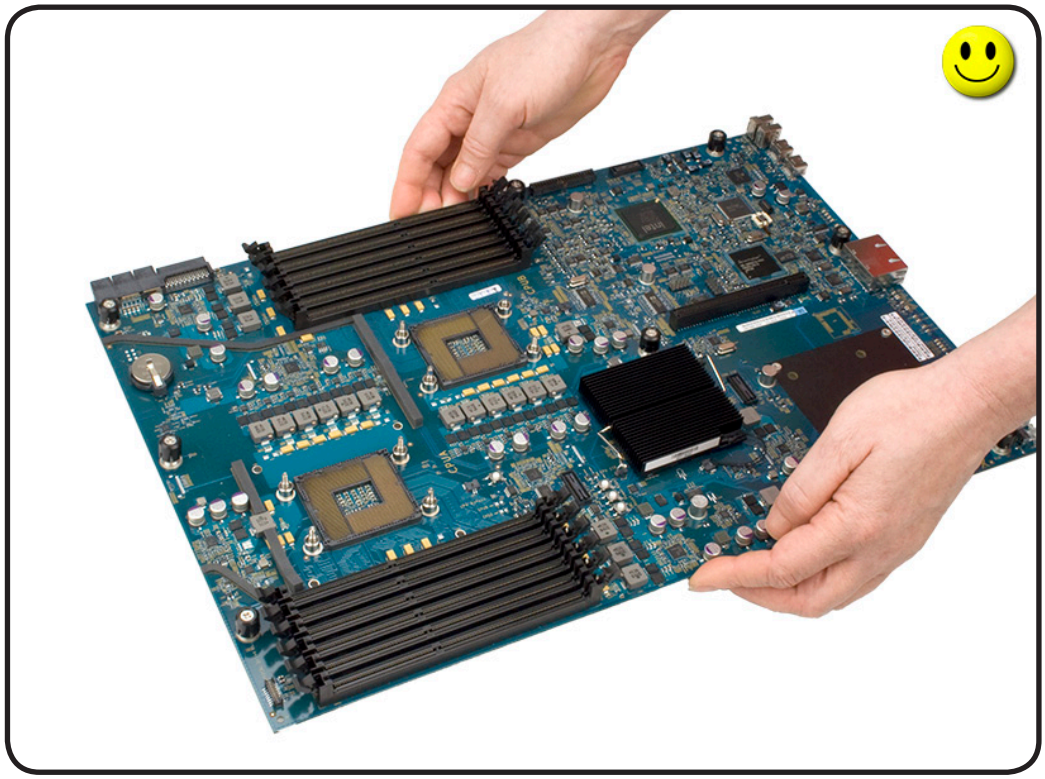
Tools

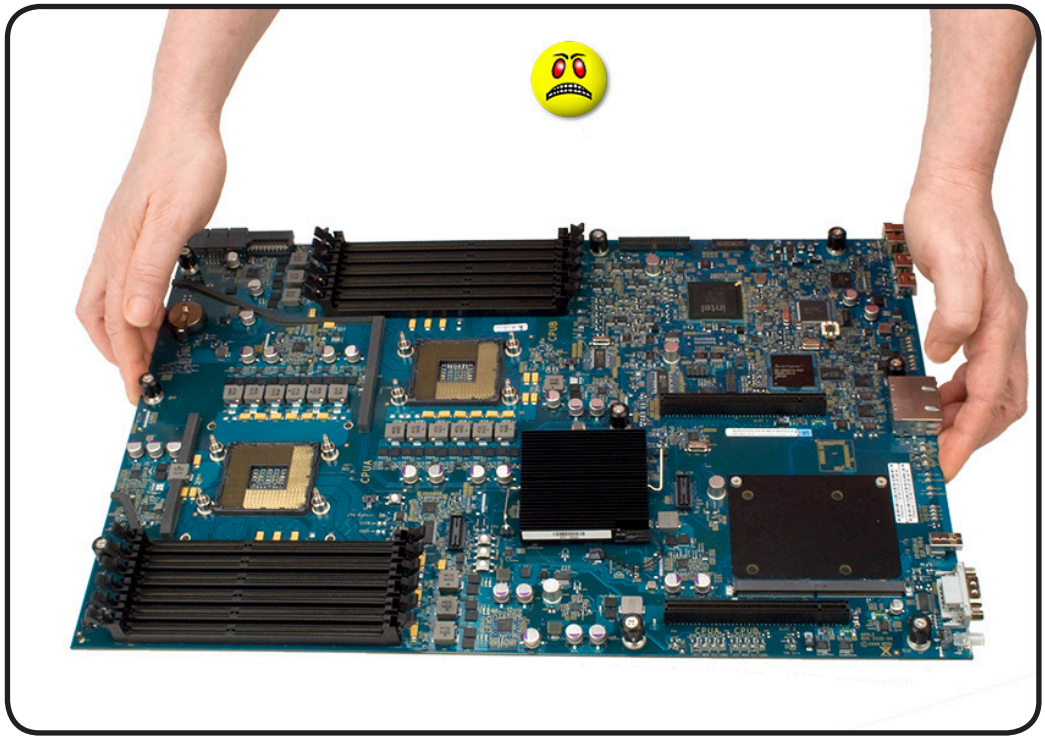
- ESD wrist strap and mat
- Phillips #1 screwdriver



Removal

1 Study the next two images for proper handling of the logic board.

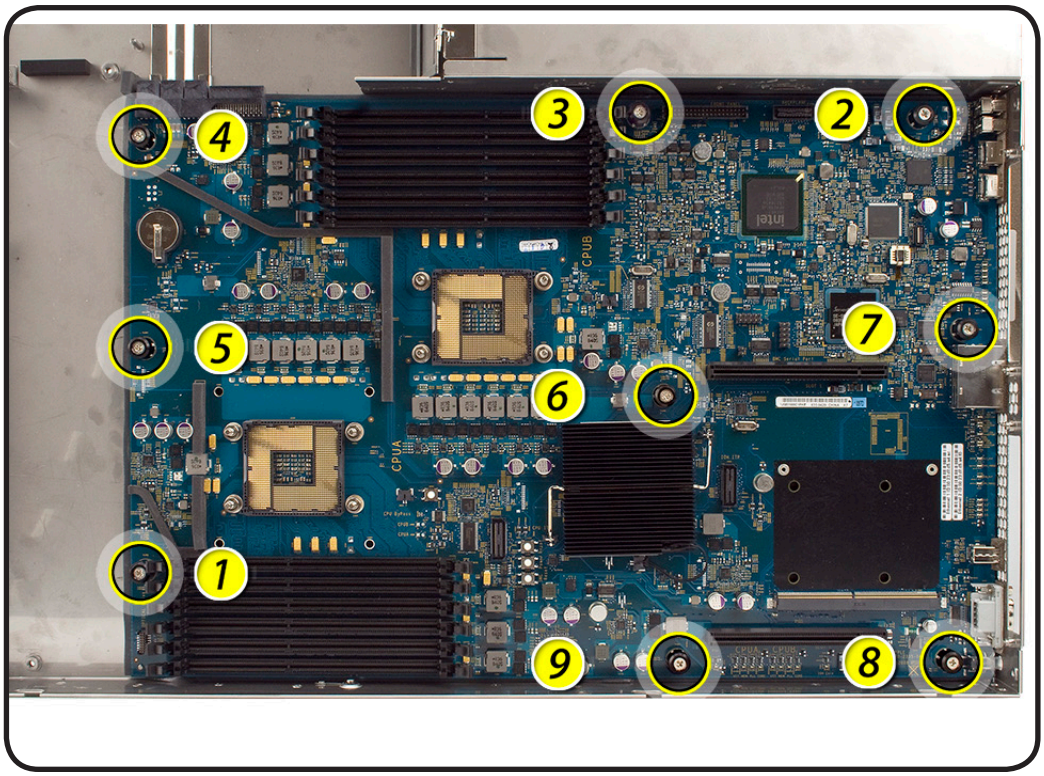




2 Loosen the nine captive thumbscrews. Follow the order shown.

3 Grasping the logic board by the thumbscrews, move it forward and slightly up.

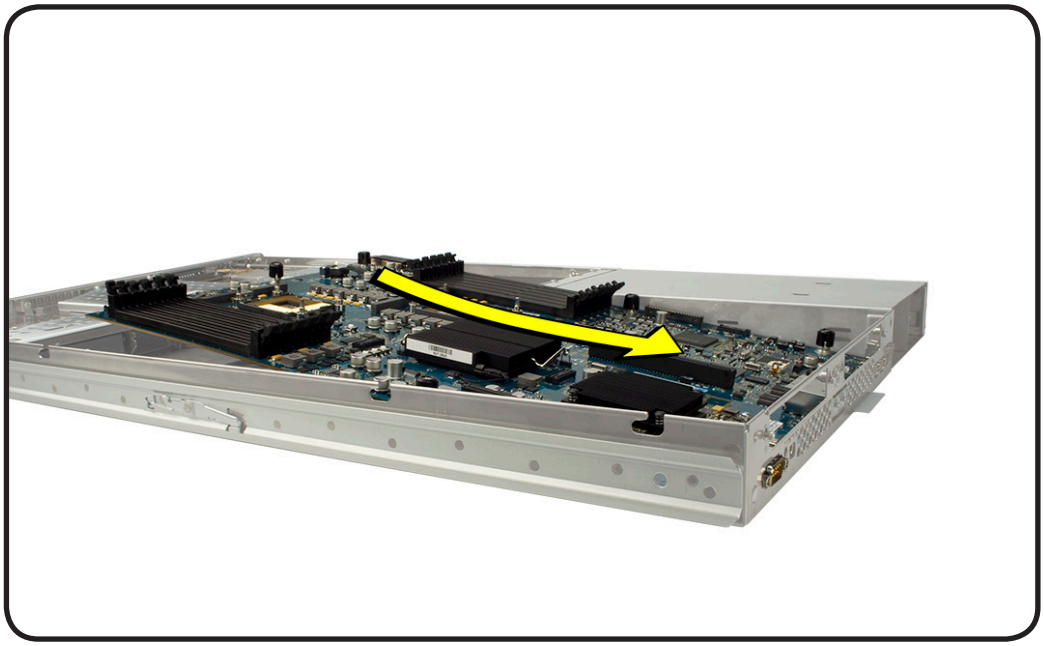
4 Remove from the Xserve.



Replacement

1 Align the rear port connectors to the enclosure

2 Raise the front end of the board 1-2 inches (3-5 cm).



3 Guide the connectors into the opening on the back panel of the enclosure.

Note: Do not leave any part of the label (such as corners) sticking up or these may catch and tear in the opening in the rear panel where the ID tab slides through.

4 Remove the battery insulator tab from the batter holder on the replacement logic board.

5 When replacing the logic board, place the new Ethernet label over the original Ethernet number on the Xserve's ID tab.

Note: Be careful when replacing the logic board. Verify that the Rear ID Button is seated properly. If you experience issues with startup, video, or LED on issues, it may be related to a stuck or jammed Rear ID Button.

See: **Won't Startup / No Video / LED On** symptom chart.

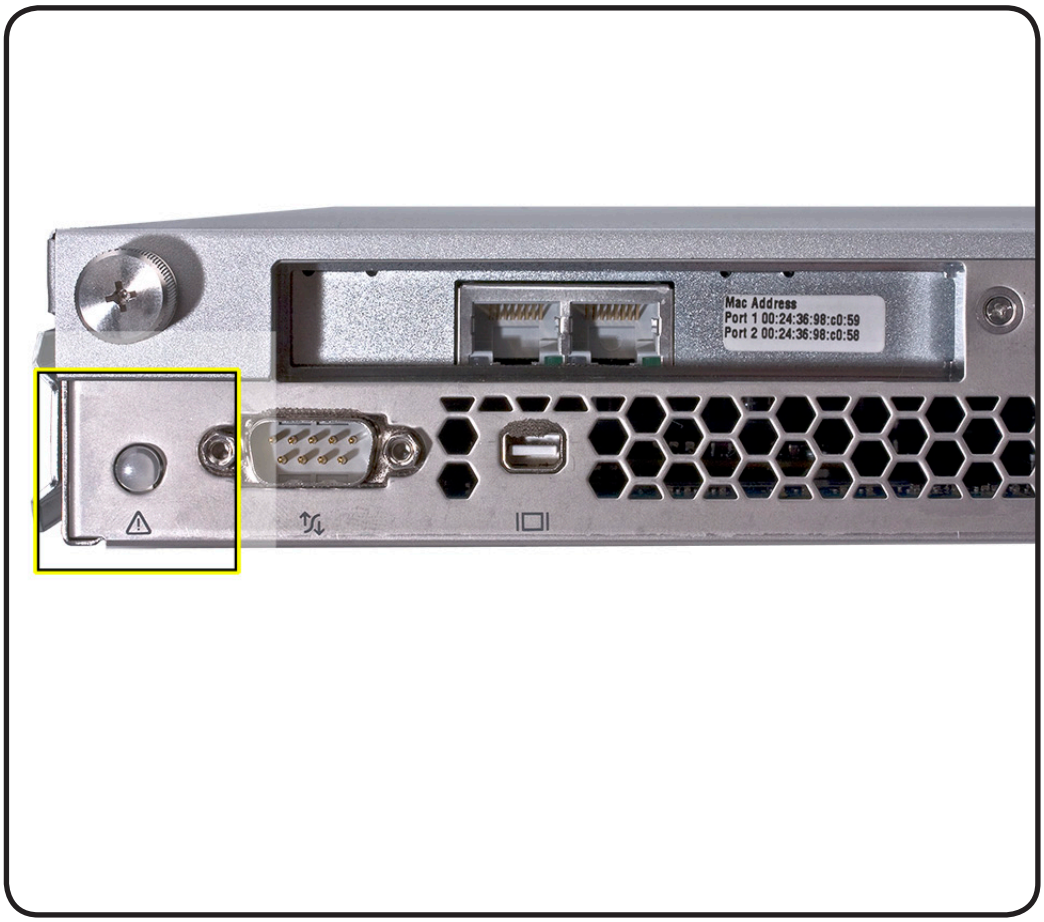
Rear ID Button

First Steps

Remove:

- Top Cover
- PCI-E Riser Cards
- PCI-E Expansion Cards

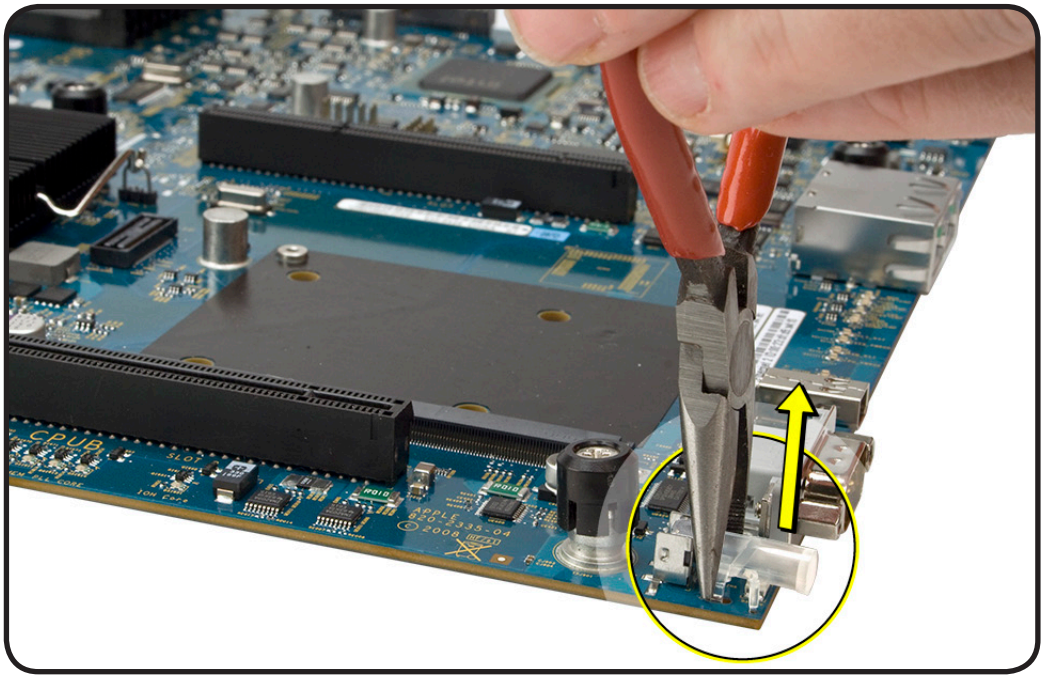
Before you begin this procedure, disconnect the battery from the logic board. Failure to do so could damage the computer.



Tools

- ESD wrist strap and mat
- Needlenose pliers

Removal



1 Using the needlenose plier, gently squeeze the two clear plastic prongs on the Rear ID Button.

2 Gently grasp the body of the button with the needlenose plier, and pull up and toward the front of the Xserve to disengage the button's two additional prongs from the logic board.

3 Continue to pull up and toward the front of the Xserve to disengage the button from the opening in the rear panel.

4 Remove the button from the enclosure.

Replacement

1 Gently insert Rear ID into logic board.

2 Take care to not bend or break the small plastic prongs.

Note: Be careful when replacing the Rear ID button. Verify that the Rear ID Button is seated properly. If you experience issues with startup, video, or LED on issues, it may be related to a stuck or jammed Rear ID Button.

See: **Won't Startup / No Video / LED On** symptom chart.

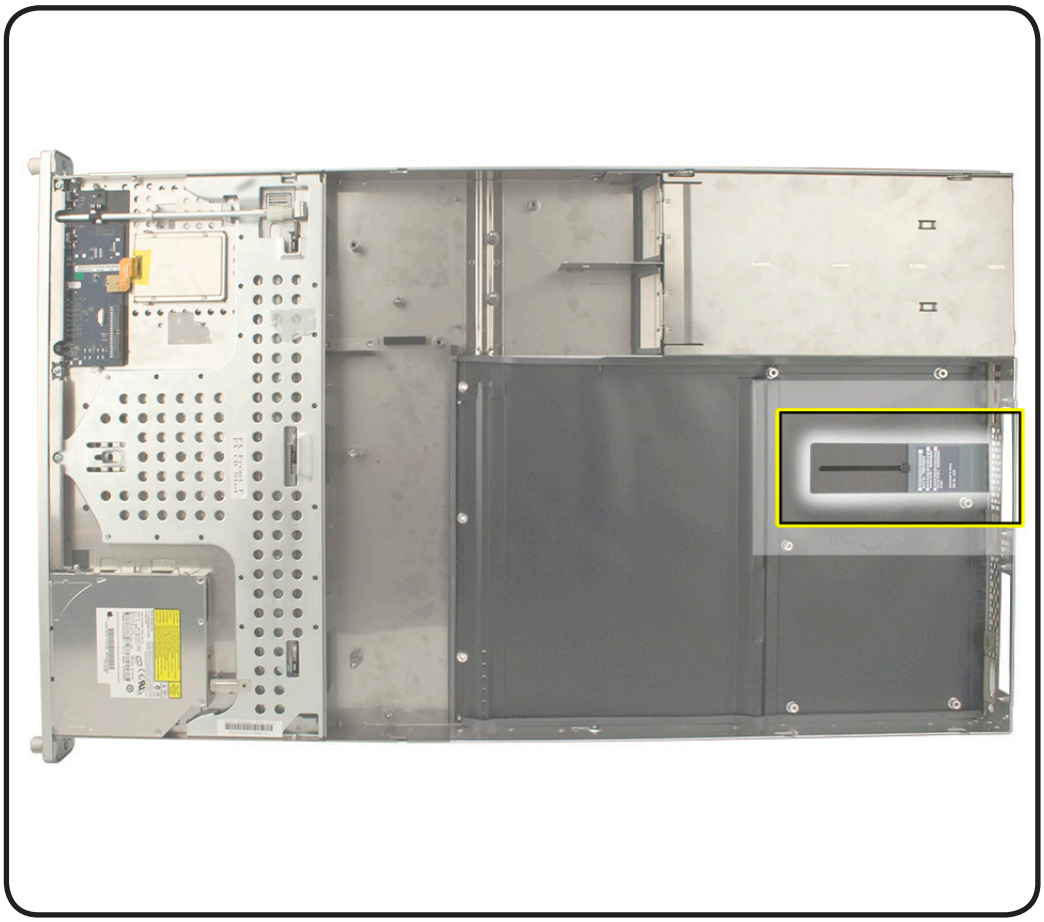
ID Tab

First Steps

Remove:

- Power Supply
- Top Cover
- PCI-E Riser Cards
- PCI-E Expansion Cards
- Backplane to Logic Board I/O Cable
- Logic Board

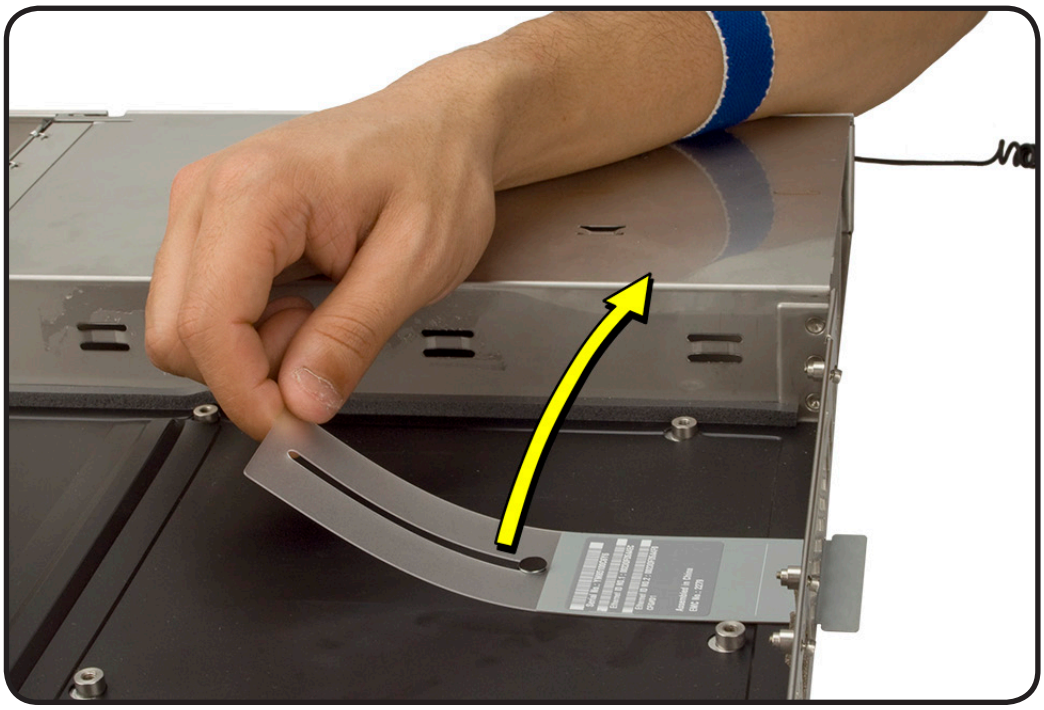
Note: DO NOT remove the processor heat sink or processor from the logic board when replacing only the ID tab.



Tools

- ESD wrist strap and mat

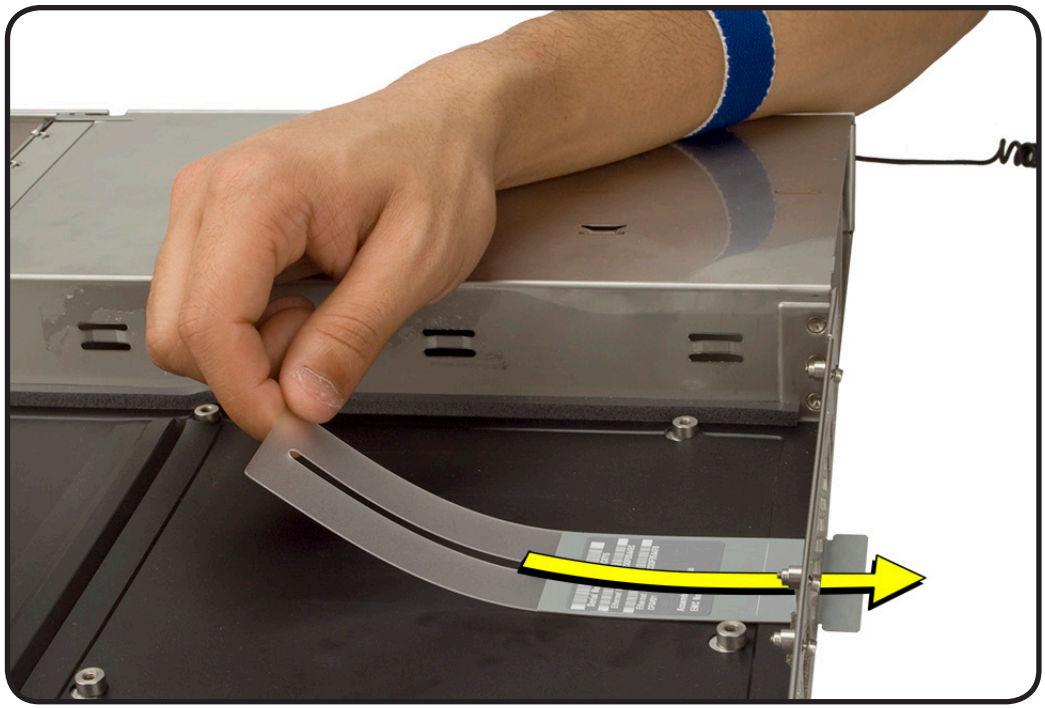
Removal



1 Gently grasp the ID tab and pull up on it to disengage it from the channel in the enclosure.

2 Pull the ID tab through the slot in the rear panel to remove.

Replacement

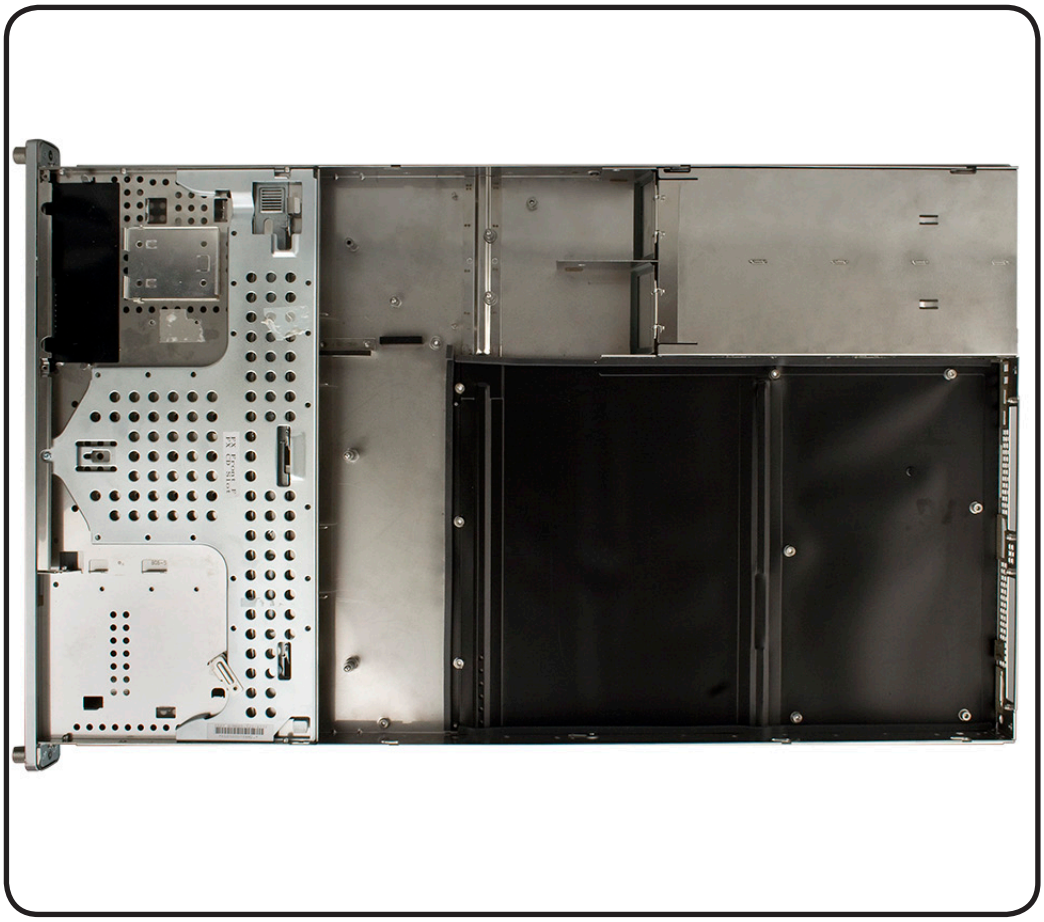


1 Pull the ID tag into the enclosure through the slot on the rear panel.

2 Gently grasp the ID tab and press down on it to engage the channel in the enclosure.

First Steps

Enclosure



Remove:

- Apple Drive Module
- Power Supply
- Top Cover
- Solid State Drive
- Solid State Drive Cable
- Solid State Drive Carrier
- PCI-E Riser Cards
- PCI-E Expansion Cards
- Optical Drive
- Airflow Duct
- Fan Array
- Front Panel Board
- Backplane-to-Logic Board Cable
- Optical Drive Cable
- Locking Mechanism Rod
- Front Panel Board Cable
- Drive Interconnect Backplane
- Power Distribution Board Cable
- Power Distribution Board
- Logic Board
- ID Tab

Important: When replacing the Enclosure, DO NOT remove the processor or heat sink from the logic board. **Remove as one piece**.

Tools

- No tools required

Removal

1 Using the first steps, remove all the components from the enclosure.

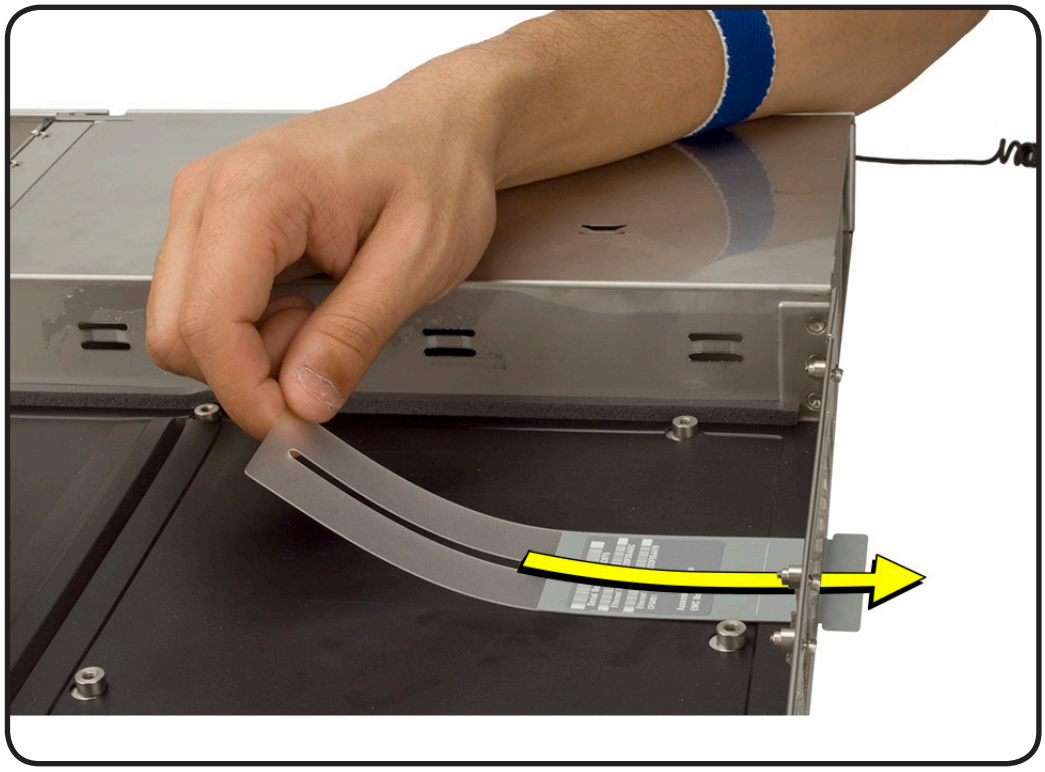
2 The enclosure should be all that is remaining.

Replacement

1 Verify that the ID Tag has been transferred into the replacement enclosure.

2 Replace all the components in the replacement enclosure

3 Verify that all components and cables are securely connected.

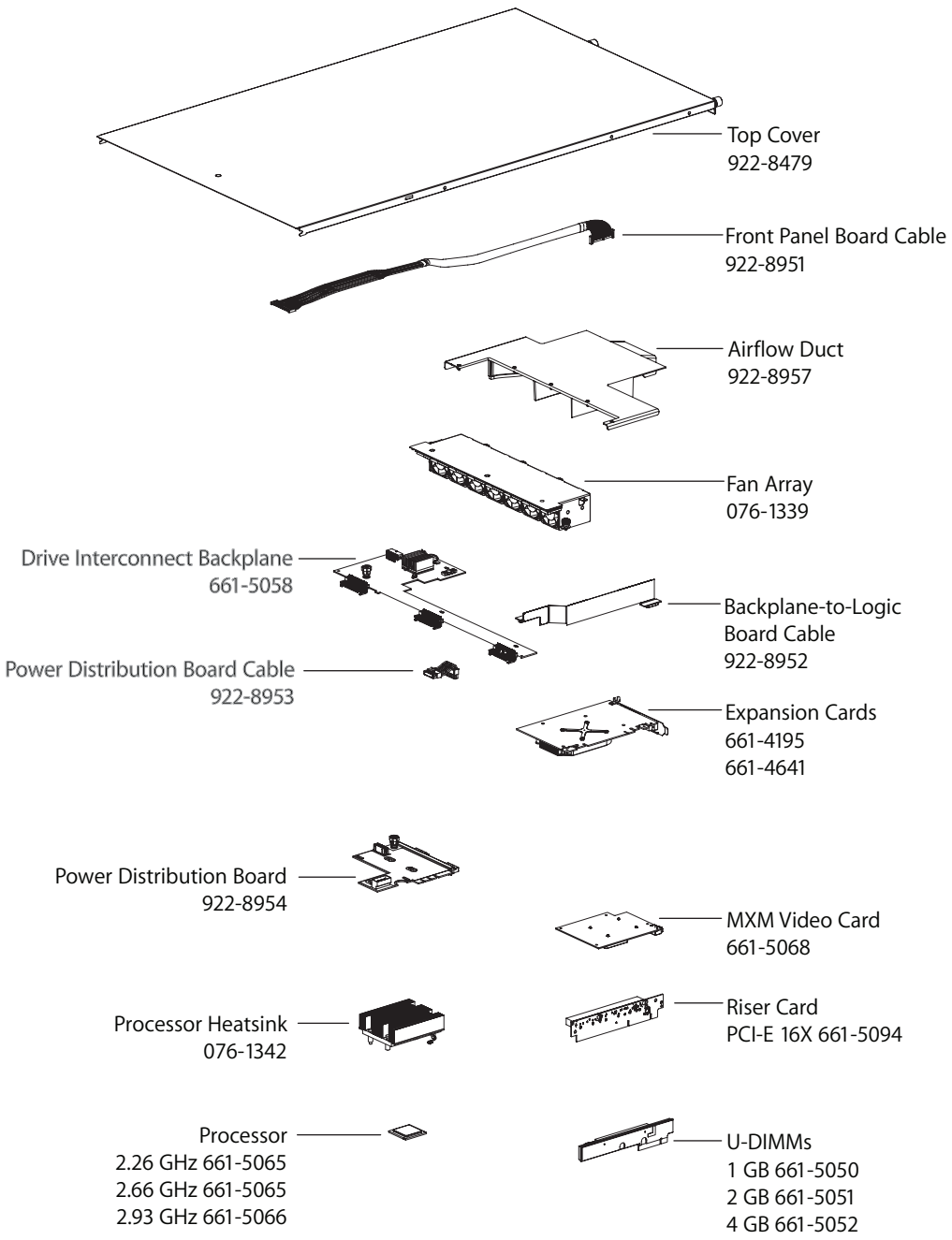


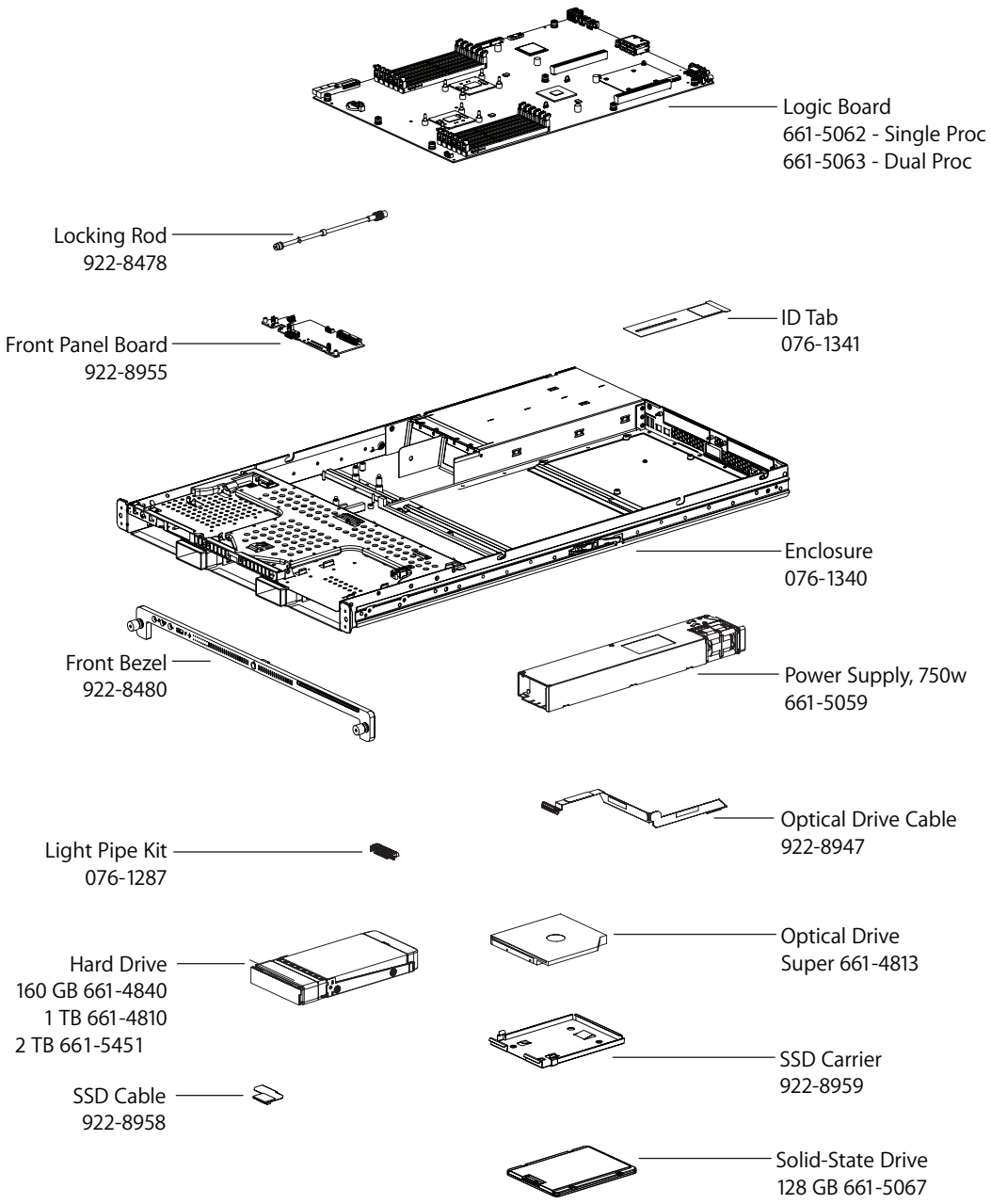
Apple Technician Guide

Views

Xserve (Early 2009)

Exploded View




Logic Board
661-5062 - Single Proc
661-5063 - Dual Proc
Locking Rod
922-8478
ID Tab
076-1341
Front Panel Board
922-8955
Enclosure
076-1340
Front Bezel
922-8480
Power Supply, 750w
661-5059
Optical Drive Cable
922-8947
Light Pipe Kit
076-1287
Optical Drive
Super 661-4813
Hard Drive
160 GB 661-4840
1 TB 661-4810
2 TB 661-5451
SSD Carrier
922-8959
SSD Cable
922-8958
Solid-State Drive
128 GB 661-5067

Feedback

We want your feedback to help improve this and future Technician Guides!

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smfeedback7@apple.com