Logic Board
Replacement Instructions

Follow the instructions in this sheet carefully. Failure to follow these instructions could damage your equipment and void its warranty.


**Important:** If you are replacing a logic board that is labeled “DDR 2GB” where shown below, you must replace it with a logic board that also is labeled “DDR 2GB.” Labels may be affixed to the board or imprinted on it.

**Figure 1**
Tools Required

The only tools required for this procedure are a #2 Phillips screwdriver and a small flat-blade screwdriver.

Opening the Server

The server slides open from the front of the rack. The top cover remains in place in the rack while the bottom housing (containing all internal components) should be placed on a sturdy, flat surface.

1. Alert users that the server will be unavailable for a period of time.

2. Shut down the server.

   **Warning:** To avoid damaging internal components or causing injury, always shut down the server before opening it. After you shut down the server, internal components can be very hot. Let the server cool for 5 to 10 minutes before continuing.

3. Write down the server's serial number, which is located on the back panel. If it is necessary to re-install the server's software after you replace the logic board, you will be asked for the serial number at login.

4. If the server is in the locked position (the yellow security LED on the front panel is on), use the Allen key that came with the server to unlock it.

5. If the cable management arm is not in use, unplug all external cables from the back panel except the power cord. (If necessary, also unplug the FireWire cable from the front panel.)

6. Touch the server's metal case to discharge any static electricity.

   **Important:** Always ground yourself by touching the server’s case before you touch any parts or install any components inside the server. To avoid static electricity building back up in your body, do not walk around the room until you have completed your work and closed the computer.

7. Release the power cord from its retaining clip and unplug the cord from the back panel.

   **Warning:** The power supply in the server is a high-voltage component and should not be opened for any reason, even when the server is off.
8. Release the two thumbscrews at the front of the server. (Figure 2)

   **Note:** The thumbscrews are captive and do not separate from the bottom housing.
9. Grasp the thumbscrews and slide the bottom housing forward part way to expose the two chassis levers. *(Figure 3)*

10. While depressing both levers, pull the bottom housing all the way forward and remove it from the rack.

*Figure 3*

11. Place the bottom housing on a sturdy, flat surface covered by an ESD mat, if available.

12. Put on an ESD wrist strap, if available.
Removing the Installed Logic Board

To remove the installed logic board, you must first remove the following parts:

- memory DIMMs
- PCI cards and PCI riser
- processor
- power supply fan duct
- PCI fan duct
- fan array
- power supply

**Note:** The replacement logic board does not include the processor, memory DIMMs, or PCI/PCI-X cards. You must transfer these parts from the original board to the new one.

**Memory DIMMs**

For each installed memory DIMM, do the following:

1. Push down the ejectors on the DIMM slot. *(Figure 4)*
2. Holding the DIMM by both top corners, lift it straight up out of the server.

**Warning:** When removing or installing the DIMM, handle it only by the edges. Do not touch its connectors. Lift the DIMM straight up from the connector to remove it, and insert it straight down into the connector to install it. Do not rock the DIMM from side to side.

*Figure 4*
PCI/PCI-X Cards and PCI Riser

PCI cards and/or PCI-X cards are installed on a dual-slot riser card attached to the logic board near the back of the server. If all cards installed are the 7-inch version, you can remove the cards and riser as a unit. However, if a 12-inch card is installed, see step 2.

**Note:** For instructions on removing/installing a PCI RAID card, consult the documentation that came with the card.

1. Release the thumbscrew that secures the card(s) to the back of the server and swing the metal cover open. (Figure 5)

   **Note:** The thumbscrew is captive; you cannot remove it.

2. If any 12-inch card is installed, slide the card guide toward the front of the server to release the card. Then remove the card from the riser.

   **Warning:** When removing or installing a PCI card, handle it only by the edges. Do not touch its connectors or any of the components on the card. Lift the card straight out from the connector to remove it, and insert it straight into the connector to install it. Do not rock the card from side to side and don’t force the card.

3. Lift the latches slightly on either side of the riser connector to release it from the logic board.

4. Pull the riser back from the logic board, and remove the riser and PCI/PCI-X card(s) from the server.

**Figure 5**
Processor

Important: The heatsink is part of the processor in the Xserve G5; do not attempt to remove the heatsink from the processor.

1. Lift the processor cap straight up and remove it from the processor/heatsink. (Figure 6)

   Note: The cap is attached to the processor by four pegs. Lift up in the areas illustrated below.

Figure 6
2. Using a Phillips screwdriver, remove the six screws that mount the heatsink and processor to the logic board. (Figure 7)

**Figure 7**

3. Lift the heatsink and processor straight up, and carefully set the unit aside on a soft, flat surface.

4. Repeat steps 1–3 for the second processor, if your server has one.
Power Supply Fan Duct

1. Insert a small flat-blade screwdriver under the latch at the right side of the duct and pry the latch forward until it releases the duct from the enclosure. (Figure 8)

2. Repeat step 1 for the left latch.

3. Holding the duct at both ends, lift it straight up and remove it from the server.

Figure 8
PCI Fan and Duct

The PCI fan is attached to a plastic duct; you remove the fan and duct as a unit.

1. Insert a small flat-blade screwdriver under the latch at the side of the PCI fan duct and pry the latch forward until it releases the duct from the enclosure. (Figure 9)

2. Holding the duct at both ends, lift it straight up a short distance.

   **Important:** Be careful not to lift the duct too high or with too much force, because it is attached to the server by the PCI fan cable. You'll detach the cable in the next step.

   **Figure 9**

3. Disconnect the PCI fan cable from the logic board. (Figure 10)

4. Remove the PCI fan and duct from the enclosure.

   **Figure 10**
Fan Array

1. Disconnect the optical drive cable from the logic board and move the cable out of the way. (Figure 11)

Figure 11

2. Press in the locking tab and release the fan cable from the logic board on the left side of the fan array. Repeat for the fan cable on the right side of the fan array. (Figure 12)

3. Release the two thumbscrews that secure the fan array to the enclosure.

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

4. Remove the fan array from the server.

Figure 12
Power Supply

1. Release the thumbscrew that secures the power supply to the chassis. (Figure 13)
   
   **Note:** The thumbscrew is captive; you cannot remove it.

2. Lift the front end of the power supply to disconnect it from the logic board.

3. Slide the power supply a short distance toward the front of the server so that the power receptacle clears the opening in the back panel.

4. Holding the power supply in both hands, remove it from the server.

Figure 13
Logic Board

1. Disconnect the FireWire cable from the logic board. ([Figure 14])

2. Release the two locking levers on the front panel board cable connector and disconnect the cable from the logic board. ([Figure 14])

3. Disconnect the three-headed drive cable from the logic board. ([Figure 14])

   Note: Xserve G5 (Cluster Node) drive cable has just one connector on each end.

[Figure 14]

4. Release the lock tab and disconnect the power cable from the logic board. ([Figure 14])

[Figure 15]
5. Fold the cables out of the way toward the front of the server.

6. Using a Phillips screwdriver, release the thumbscrew that secures the logic board to the chassis (indicated by a triangle in Figure 16).

   **Note:** The thumbscrew is captive; you cannot remove it.

7. Grasping the logic board by its long edges, move it forward and up slightly to release it from the four mounting pegs (indicated by the squares in Figure 16).

   **Caution:** Be careful not to flex the logic board, which could damage the board or its components. To minimize flexing, always grasp the logic board by its long edges when removing or installing it.

---

**Figure 16**

8. Grasping the long edges of the logic board, tilt up the front end of the board so that the board ports clear the openings in the back of the enclosure.

9. Grasp the logic board by its long edges and remove it from the server. Make sure the board clears the two chassis release levers.
Installing the Replacement Logic Board

**Caution:** Be careful not to flex the logic board, which could damage the board or its components. To minimize flexing, always grasp the logic board by its long edges when removing or installing it.

1. Grasping the replacement logic board by its long edges, install it in the bottom housing, making sure the board fits over the four mounting pegs on the chassis floor.

2. Grasp the logic board by its long edges and slide it back until all ports are seated in the openings in the back panel. Take special care to fit the clear plastic system identifier button through its opening. (The system identifier button is located low on the back panel, to the left of center.) *(Figure 17)*

3. Tighten the thumbscrew that secures the logic board to the chassis.

4. Reconnect the following cables to the logic board:
   - power cable
   - three-headed drive cable
   - front panel board cable
   - FireWire cable

**Power Supply**

1. Angle the power supply back into the bottom housing, so that the power receptacle on the back of the power supply fits into the opening in the server’s back panel.

   **Note:** The power supply should engage with a pin on the inside of the back panel.

2. Lower the power supply and press firmly on its connector until it is firmly seated on the logic board.

3. Tighten the power supply thumbscrew.

**Fan Array**

1. Install the fan array in the server’s bottom housing and tighten the thumbscrew at each end.

2. Connect the fan array’s two power cables to the logic board.
3. Reconnect the optical drive cable to the logic board.

**PCI Fan and Duct**
1. Connect the PCI fan cable to the logic board.
2. Line up the post on the underside of the PCI fan duct with the post on the logic board and carefully press the duct into place in the server.

**Power Supply Fan Duct**
1. Line up the latches on the side of the power supply fan duct with the slots in the side of the server chassis.
2. Carefully press the power supply fan duct into place in the server.

**Processor**

**Important:** If you are replacing the processor in a single-processor server, make sure you install the processor in the left processor connector on the logic board. *(Figure 18)* If a single processor is installed in the other processor connector, the server will not start up properly. Processors in a dual-processor server may be installed in either connector.

*Figure 18*

1. Remove the cover over the logic board connector for the processor.

**Note:** If the server has just one processor, remove the cover on only the left connector.
2. Position the replacement processor over its logic board connector and press down, being careful not to touch any chips on the logic board or processor.

3. Replace the six mounting screws. (Figure 19)

   **Note:** There are two different types of processor mounting screws. Begin by installing the two shorter screws in the screw holes indicated by the squares in Figure 18. Then install the four longer screws in the screw holes indicated by the circles in Figure 18.

   **Figure 19**

4. Replace the processor cap and carefully press down, making sure the four pegs on the cap engage with the peg holes in the processor.

5. Repeat steps 1–4 for the second processor, if your server has one.
PCI/PCI-X Cards and PCI Riser

1. Hold the PCI riser by the edges, line it up with its connector on the side of the logic board, and gently press the riser into the connector until it is securely in place.

   **Note:** If you removed the riser with 7-inch card(s) attached, you can re-install the riser with the card(s) attached.

2. If you are replacing a 12-inch card, hold it by the edges, line it up with the connector on the riser, and press it into the connector until it is securely seated. Make sure the card fits into the card guide.

   **Warning:** When installing a PCI card, handle it only by the edges. Do not touch its connectors or any of the components on the card. Insert the card straight into the connector to install it. Do not rock the card from side to side and don’t force the card. Once the card is installed, pull on it gently to check that it is properly connected.

3. Replace the slot cover for any slot that does not have a card installed.

4. Close the metal cover on the back panel that secures the cards, and tighten the cover’s thumbscrew.

Memory DIMMs

1. Hold the DIMM by the edges and carefully slide it into the DIMM slot on the logic board, pressing down at the center of the DIMM to seat it correctly.

2. Repeat this procedure for each DIMM you are transferring to the replacement logic board.

   **Note:** The DIMM is designed to fit into the slot only one way. Be sure to align the notch in the DIMM with the small rib inside the slot. *(Figure 20)*

**Figure 20**
Important: Install the DIMMs in pairs, one in each bank of DIMM connectors, starting from the center of the server and moving outward. (Figure 21)

Figure 21

Battery

Remove the battery insulator tab from the battery holder on the logic board. (Figure 22)

Figure 22
Ethernet Label

Replacing the logic board in the server changes its Ethernet ID number. The new number is printed on an Ethernet ID label packaged with the replacement logic board. After installing the new logic board, cover the Ethernet ID number on the server's back panel with the new ID label.

Closing the Server

1. Carefully slide the bottom housing back into the rack.
2. Tighten the front thumb screws to secure it.
3. Reattach all cables and plug the power cord into the wall socket or other power source.
4. Start up the server, and use Server Monitor to check that it is operating properly.

Warning: Never turn on the server unless all of its internal and external parts are in place and it is closed. Operating the server when it is open or missing parts can damage it or cause injury.