

System x iDataPlex dx360
Types 6313, 6316, 6385, 6390, 7831, and 7833



Problem Determination and Service Guide

System x iDataPlex dx360
Types 6313, 6316, 6385, 6390, 7831, and 7833



Problem Determination and Service Guide

Note: Before using this information and the product it supports, read the general information in Appendix B, "Notices," on page 151, and the *Warranty and Support Information* document on the IBM *Documentation CD*.

Fourth Edition (January 2010)

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Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الأمنية

Antes de instalar este produto, leia as Informações de Segurança.

在安装本产品之前，请仔细阅读 **Safety Information** (安全信息)。

安裝本產品之前，請先閱讀「安全資訊」。

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Před instalací tohoto produktu si přečtete příručku bezpečnostních instrukcí.

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

Ennen kuin asennat tämän tuotteen, lue turvaohjeet kohdasta Safety Information.

Avant d'installer ce produit, lisez les consignes de sécurité.

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

Πριν εγκαταστήσετε το προϊόν αυτό, διαβάστε τις πληροφορίες ασφαλείας (safety information).

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

A termék telepítése előtt olvassa el a Biztonsági előírásokat!

Prima di installare questo prodotto, leggere le Informazioni sulla Sicurezza.

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

Пред да се инсталира овој продукт, прочитајте информацијата за безбедност.

Les sikkerhetsinformasjonen (Safety Information) før du installerer dette produktet.

Przed zainstalowaniem tego produktu, należy zapoznać się z książką "Informacje dotyczące bezpieczeństwa" (Safety Information).

Antes de instalar este produto, leia as Informações sobre Segurança.

Перед установкой продукта прочтите инструкции по технике безопасности.

Pred inštaláciou tohto zariadenia si pečítajte Bezpečnostné predpisy.

Pred namestitvijo tega proizvoda preberite Varnostne informacije.

Antes de instalar este producto, lea la información de seguridad.

Läs säkerhetsinformationen innan du installerar den här produkten.

Guidelines for trained service technicians

This section contains information for trained service technicians.

Inspecting for unsafe conditions

Use the information in this section to help you identify potential unsafe conditions in an IBM product on which you are working. Each IBM product, as it was designed and manufactured, has required safety items to protect users and service technicians from injury. The information in this section addresses only those items. Use good judgment to identify potential unsafe conditions that might be caused by non-IBM alterations or attachment of non-IBM features or optional devices that are not addressed in this section. If you identify an unsafe condition, you must determine how serious the hazard is and whether you must correct the problem before you work on the product.

Consider the following conditions and the safety hazards that they present:

- Electrical hazards, especially primary power. Primary voltage on the frame can cause serious or fatal electrical shock.
- Explosive hazards, such as a damaged CRT face or a bulging capacitor.
- Mechanical hazards, such as loose or missing hardware.

To inspect the product for potential unsafe conditions, complete the following steps:

1. Make sure that the power is off and the power cord is disconnected.
2. Make sure that the exterior cover is not damaged, loose, or broken, and observe any sharp edges.
3. Check the power cord:
 - Make sure that the third-wire ground connector is in good condition. Use a meter to measure third-wire ground continuity for 0.1 ohm or less between the external ground pin and the frame ground.
 - Make sure that the power cord is the correct type, as specified in Chapter 4, "Parts listing," on page 87 and "Power cords" on page 92.
 - Make sure that the insulation is not frayed or worn.
4. Remove the cover.
5. Check for any obvious non-IBM alterations. Use good judgment as to the safety of any non-IBM alterations.
6. Check inside the server for any obvious unsafe conditions, such as metal filings, contamination, water or other liquid, or signs of fire or smoke damage.
7. Check for worn, frayed, or pinched cables.
8. Make sure that the power-supply cover fasteners (screws or rivets) have not been removed or tampered with.

Guidelines for servicing electrical equipment

Observe the following guidelines when you service electrical equipment:

- Check the area for electrical hazards such as moist floors, nongrounded power extension cords, and missing safety grounds.
- Use only approved tools and test equipment. Some hand tools have handles that are covered with a soft material that does not provide insulation from live electrical current.
- Regularly inspect and maintain your electrical hand tools for safe operational condition. Do not use worn or broken tools or testers.

- Do not touch the reflective surface of a dental mirror to a live electrical circuit. The surface is conductive and can cause personal injury or equipment damage if it touches a live electrical circuit.
- Some rubber floor mats contain small conductive fibers to decrease electrostatic discharge. Do not use this type of mat to protect yourself from electrical shock.
- Do not work alone under hazardous conditions or near equipment that has hazardous voltages.
- Locate the emergency power-off (EPO) switch, disconnecting switch, or electrical outlet so that you can turn off the power quickly in the event of an electrical accident.
- Disconnect all power before you perform a mechanical inspection, work near power supplies, or remove or install main units.
- Before you work on the equipment, disconnect the power cord. If you cannot disconnect the power cord, have the customer power-off the wall box that supplies power to the equipment and lock the wall box in the off position.
- Never assume that power has been disconnected from a circuit. Check it to make sure that it has been disconnected.
- If you have to work on equipment that has exposed electrical circuits, observe the following precautions:
 - Make sure that another person who is familiar with the power-off controls is near you and is available to turn off the power if necessary.
 - When you work with powered-on electrical equipment, use only one hand. Keep the other hand in your pocket or behind your back to avoid creating a complete circuit that could cause an electrical shock.
 - When you use a tester, set the controls correctly and use the approved probe leads and accessories for that tester.
 - Stand on a suitable rubber mat to insulate you from grounds such as metal floor strips and equipment frames.
- Use extreme care when you measure high voltages.
- To ensure proper grounding of components such as power supplies, pumps, blowers, fans, and motor generators, do not service these components outside of their normal operating locations.
- If an electrical accident occurs, use caution, turn off the power, and send another person to get medical aid.

Safety statements

Important: Each caution and danger statement in this document is labeled with a number. This number is used to cross reference an English-language caution or danger statement with translated versions of the caution or danger statement in the *Safety Information* document.

For example, if a caution statement is labeled "Statement 1", translations for that caution statement are in the *Safety Information* document under Statement 1.

Be sure to read all caution and danger statements in this document before you perform the procedures. Read any additional safety information that comes with your server or optional device before you install the device.

Statement 1:



DANGER

Electrical current from power, telephone, and communication cables is hazardous.

To avoid a shock hazard:

- **Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.**
- **Connect all power cords to a properly wired and grounded electrical outlet.**
- **Connect to properly wired outlets any equipment that will be attached to this product.**
- **When possible, use one hand only to connect or disconnect signal cables.**
- **Never turn on any equipment when there is evidence of fire, water, or structural damage.**
- **Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.**
- **Connect and disconnect cables as described in the following table when installing, moving, or opening covers on this product or attached devices.**

To Connect:

1. Turn everything OFF.
2. First, attach all cables to devices.
3. Attach signal cables to connectors.
4. Attach power cords to outlet.
5. Turn device ON.

To Disconnect:

1. Turn everything OFF.
2. First, remove power cords from outlet.
3. Remove signal cables from connectors.
4. Remove all cables from devices.

Statement 2:



CAUTION:

When replacing the lithium battery, use only IBM Part Number 33F8354 or an equivalent type battery recommended by the manufacturer. If your system has a module containing a lithium battery, replace it only with the same module type made by the same manufacturer. The battery contains lithium and can explode if not properly used, handled, or disposed of.

Do not:

- Throw or immerse into water
- Heat to more than 100°C (212°F)
- Repair or disassemble

Dispose of the battery as required by local ordinances or regulations.

Statement 3:



CAUTION:

When laser products (such as CD-ROMs, DVD drives, fiber optic devices, or transmitters) are installed, note the following:

- Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.
- Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.

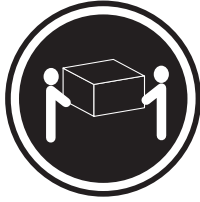


DANGER

Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following.

Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.

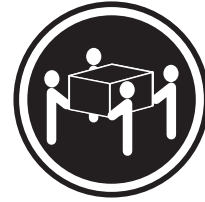
Statement 4:



≥ 18 kg (39.7 lb)



≥ 32 kg (70.5 lb)



≥ 55 kg (121.2 lb)

CAUTION:

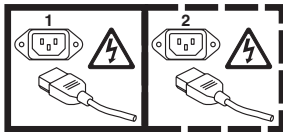
Use safe practices when lifting.

Statement 5:



CAUTION:

The power control button on the device and the power switch on the power supply do not turn off the electrical current supplied to the device. The device also might have more than one power cord. To remove all electrical current from the device, ensure that all power cords are disconnected from the power source.



Statement 8:



CAUTION:

Never remove the cover on a power supply or any part that has the following label attached.



Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.

Statement 10:



CAUTION:

Do not place any object on top of rack-mounted devices.



Chapter 1. Start here

You can solve many problems without outside assistance by following the troubleshooting procedures in this *Problem Determination and Service Guide* and on the IBM® Web site. This document describes the diagnostic tests that you can perform, troubleshooting procedures, and explanations of error messages and error codes. The documentation that comes with your operating system and software also contains troubleshooting information.

Diagnosing a problem

Before you contact IBM or an approved warranty service provider, follow these procedures in the order in which they are presented to diagnose a problem with your server:

1. **Determine what has changed.**

Determine whether any of the following items were added, removed, replaced, or updated before the problem occurred:

- UEFI code (formerly called BIOS code)
- Device drivers
- Firmware
- Hardware components
- Software

If possible, return the server to the condition it was in before the problem occurred.

2. **Collect data.**

Thorough data collection is necessary for diagnosing hardware and software problems.

a. **Document error codes and system-board LEDs.**

- **System-board LEDs:** See “System-board LEDs” on page 11 for information about system-board LEDs.
- **System error codes:** See “Error logs” on page 52 for information about a specific error code.
- **Software or operating-system error codes:** See the documentation for the software or operating system for information about a specific error code. See the manufacturer’s Web site for documentation.

b. **Collect system data.**

Run Dynamic System Analysis (DSA) to collect information about the hardware, firmware, software, and operating system. Have this information available when you contact IBM or an approved warranty service provider. See “Diagnostic programs, messages, and error codes” on page 63 for the instructions to run the DSA program.

To download the latest version of DSA, go to <http://www.ibm.com/systems/support/supportsite.wss/docdisplay?brandind=5000008&Indocid=SERV-DSA> or complete the following steps.

Note: Changes are made periodically to the IBM Web site. The actual procedure might vary slightly from what is described in this document.

- 1) Go to <http://www.ibm.com/systems/support/>.
- 2) Under **Product support**, click **System x**.

- 3) Under **Popular links**, click **Software and device drivers**.
- 4) Under **Related downloads**, click **Dynamic System Analysis (DSA)**.

For information about DSA command-line options, go to http://publib.boulder.ibm.com/infocenter/toolsctr/v1r0/index.jsp?topic=/com.ibm.xseries.tools.doc/erep_tools_dsa.html or complete the following steps:

- 1) Go to <http://publib.boulder.ibm.com/infocenter/toolsctr/v1r0/index.jsp>.
 - 2) In the navigation pane, click **IBM System x and BladeCenter Tools Center**.
 - 3) Click **Tools reference > Error reporting and analysis tools > IBM Dynamic System Analysis**.
3. **Follow the problem-resolution procedures.**

The four problem-resolution procedures are presented in the order in which they are most likely to solve your problem. Follow these procedures in the order in which they are presented:

a. **Check for and apply code updates.**

Most problems that appear to be caused by faulty hardware are actually caused by BIOS code, system firmware, device firmware, or device drivers that are not at the latest levels.

Important: Some cluster solutions require specific code levels or coordinated code updates. If the device is part of a cluster solution, verify that the latest level of code is supported for the cluster solution before you update the code.

1) **Determine the existing code levels.**

In DSA, click **Firmware/VPD** to view system firmware levels, or click **Software** to view operating-system levels.

2) **Download and install updates of code that is not at the latest level.**

To display a list of available updates for your server, go to <http://www.ibm.com/systems/support/supportsite.wss/docdisplay?brandind=5000008&Indocid=MIGR-4JTS2T> or complete the following steps.

Note: Changes are made periodically to the IBM Web site. The actual procedure might vary slightly from what is described in this document.

- a) Go to <http://www.ibm.com/systems/support/>.
- b) Under **Product support**, click **System x**.
- c) Under **Popular links**, click **Software and device drivers**.
- d) Click **System x iDataPlex dx360 server** to display the list of downloadable files for the server.

You can install code updates that are packaged as an Update*Xpress* System Pack or Update*Xpress* CD image. An Update*Xpress* System Pack contains an integration-tested bundle of online firmware and device-driver updates for your server.

Be sure to separately install any listed critical updates that have release dates that are later than the release date of the Update*Xpress* System Pack or Update*Xpress* image.

When you click an update, an information page is displayed, including a list of the problems that the update fixes. Review this list for your specific problem; however, even if your problem is not listed, installing the update might solve the problem.

b. **Check for and correct an incorrect configuration.**

If the server is incorrectly configured, a system function can fail to work when you enable it; if you make an incorrect change to the server configuration, a system function that has been enabled can stop working.

1) **Make sure that all installed hardware and software are supported.**

If any hardware or software component is not supported, uninstall it to determine whether it is causing the problem. You must remove nonsupported hardware before you contact IBM or an approved warranty service provider for support.

2) **Make sure that the server, operating system, and software are installed and configured correctly.**

Many configuration problems are caused by loose power or signal cables or incorrectly seated adapters. You might be able to solve the problem by turning off the server, reconnecting cables, reseating adapters, and turning the server back on. For information about performing the checkout procedure, see “Checkout procedure” on page 54.

If the problem is associated with a specific function (for example, if a RAID hard disk drive is marked offline in the RAID array), see the documentation for the associated controller and management or controlling software to verify that the controller is correctly configured.

Problem determination information is available for many devices such as RAID and network adapters.

For problems with operating systems or IBM software or devices, complete the following steps.

Note: Changes are made periodically to the IBM Web site. The actual procedure might vary slightly from what is described in this document.

- a) Go to <http://www.ibm.com/systems/support/>.
- b) Under **Product support**, click **System x**.
- c) From the **Product family** list, select **System x iDataPlex dx360 server**.
- d) Under **Support & downloads**, click **Documentation, Install**, and **Use** to search for related documentation.

c. **Check for troubleshooting procedures and RETAIN tips.**

Troubleshooting procedures and RETAIN tips document known problems and suggested solutions. To search for troubleshooting procedures and RETAIN tips, complete the following steps.

Note: Changes are made periodically to the IBM Web site. The actual procedure might vary slightly from what is described in this document.

- 1) Go to <http://www.ibm.com/systems/support/>.
- 2) Under **Product support**, click **System x**.
- 3) From the **Product family** list, select **System x iDataPlex dx360 server**.
- 4) Under **Support & downloads**, click **Troubleshoot**.

5) Select the troubleshooting procedure or RETAIN tip that applies to your problem:

- Troubleshooting procedures are under **Diagnostic**.
- RETAIN tips are under **Troubleshoot**.

d. **Check for and replace defective hardware.**

If a hardware component is not operating within specifications, it can cause unpredictable results. Most hardware failures are reported as error codes in a system or operating-system log. For more information, see “Troubleshooting tables” on page 57 and Chapter 5, “Removing and replacing server components,” on page 95. Hardware errors are also indicated by light path diagnostics LEDs.

A single problem might cause multiple symptoms. Follow the troubleshooting procedure for the most obvious symptom. If that procedure does not diagnose the problem, use the procedure for another symptom, if possible.

If the problem remains, contact IBM or an approved warranty service provider for assistance with additional problem determination and possible hardware replacement. To open an online service request, go to <http://www.ibm.com/support/electronic/>. Be prepared to provide information about any error codes and collected data.

Undocumented problems

If you have completed the diagnostic procedure and the problem remains, the problem might not have been previously identified by IBM. After you have verified that all code is at the latest level, all hardware and software configurations are valid, and no light path diagnostics LEDs or log entries indicate a hardware component failure, contact IBM or an approved warranty service provider for assistance. To open an online service request, go to <http://www.ibm.com/support/electronic/>. Be prepared to provide information about any error codes and collected data and the problem determination procedures that you have used.

Chapter 2. Introduction

This *Problem Determination and Service Guide* contains information to help you solve problems that might occur in your IBM System x iDataPlex™ dx360 system-board tray or your IBM System x iDataPlex 2U flex chassis . It describes the diagnostic tools that are available, error codes and suggested actions, and instructions for replacing failing components.

Replaceable components are of three types:

- **Tier 1 customer replaceable unit (CRU):** Replacement of Tier 1 CRUs is your responsibility. If IBM installs a Tier 1 CRU at your request, you will be charged for the installation.
- **Tier 2 customer replaceable unit:** You may install a Tier 2 CRU yourself or request IBM to install it, at no additional charge, under the type of warranty service that is designated for your server.
- **Field replaceable unit (FRU):** FRUs must be installed only by trained service technicians.

For information about the terms of the warranty and getting service and assistance, see the *Warranty and Support Information* document on the IBM *Documentation* CD.

Related documentation

In addition to the printed *Important Notices* document and this *Problem Determination and Service Guide*, the following documentation for the dx360 system-board tray and 2U flex chassis is provided in Portable Document Format (PDF) on the IBM *Documentation* CD:

- *Warranty and Support Information*

This document contains information about the terms of the warranty and getting service and assistance.

- *Safety Information*

This document contains translated caution and danger statements. Each caution and danger statement that appears in the documentation has a number that you can use to locate the corresponding statement in your language in the *Safety Information* document.

- *Environmental Notices and User's Guide*

This document is in PDF on the IBM *Documentation* CD. It contains translated environmental notices.

- *User's Guide*

This document contains general information about how to use, upgrade, and configure the 2U chassis, the dx360 system-board tray, and the System x iDataPlex storage enclosure.

Depending on the hardware configuration, additional documentation might be included on the IBM *Documentation* CD.

The iDataPlex documentation might be updated occasionally, or technical updates might be available to provide additional information that is not included in the documentation. These updates are available from the IBM Systems Information Center. To check for updated iDataPlex information and technical updates, go to <http://publib.boulder.ibm.com/infocenter/idadaplx/documentation/index.jsp> .

The updated iDataPlex documentation also is available from the IBM Support Web site. To check for updated documentation and technical updates, complete the following steps.

Note: Changes are made periodically to the IBM Web site. The actual procedure might vary slightly from what is described in this document.

1. Go to <http://www.ibm.com/systems/support/>.
2. Under **Product support**, click **System x**.
3. Under **Popular links**, click **Publications lookup**.
4. From the **Product family** menu, select **System x iDataPlex dx360 server** and click **Go**.

Notices and statements in this document

The caution and danger statements in this document are also in the multilingual *Safety Information* document, which is on the IBM *Documentation* CD. Each statement is numbered for reference to the corresponding statement in your language in the *Safety Information* document.

The following notices and statements are used in this document:

- **Note:** These notices provide important tips, guidance, or advice.
- **Important:** These notices provide information or advice that might help you avoid inconvenient or problem situations.
- **Attention:** These notices indicate potential damage to programs, devices, or data. An attention notice is placed just before the instruction or situation in which damage might occur.
- **Caution:** These statements indicate situations that can be potentially hazardous to you. A caution statement is placed just before the description of a potentially hazardous procedure step or situation.
- **Danger:** These statements indicate situations that can be potentially lethal or extremely hazardous to you. A danger statement is placed just before the description of a potentially lethal or extremely hazardous procedure step or situation.

Features and specifications

The following information is a summary of the features and specifications of the hardware. Depending on the hardware configuration, some features might not be available, or some specifications might not apply.

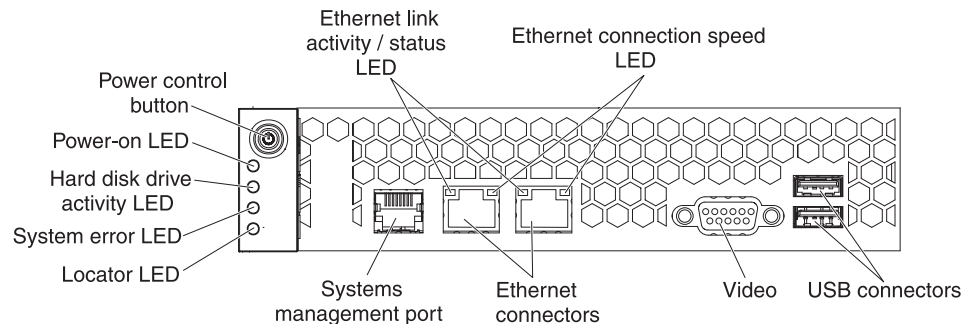
Racks are marked in vertical increments of 4.45 cm (1.75 inches). Each increment is referred to as a unit, or “U.” A 1U-high device is 1.75 inches tall.

Table 1. Features and specifications

<p>Microprocessor: Supports two dual-core or quad-core Intel® Xeon microprocessors in each system-board tray</p> <p>Note: Use the BIOS Setup Utility program to determine the type and speed of the microprocessor.</p> <p>Memory:</p> <ul style="list-style-type: none"> • Four-channel DIMMs: 16 DIMM connectors • Types: Fully buffered double-data rate (DDR2) 667 MHz DIMMs with AMB+ or DDR2 800 MHz DIMMs with AMB+ • Supports 2 GB and 4 GB DIMMs (as of the date of this publication) with up to 64 GB of total memory in each system-board tray <p>Hard disk drives:</p> <ul style="list-style-type: none"> • The system-board tray supports one 3.5-inch simple-swap SAS or one 3.5-inch simple-swap SATA hard disk drive. • The system-board tray with a storage enclosure attached can support up to four 3.5-inch simple-swap SAS hard disk drives or up to five 3.5-inch simple-swap SATA hard disk drives. 	<p>PCI expansion slots:</p> <ul style="list-style-type: none"> • Each system-board tray supports one PCIe expansion slot <p>Integrated functions:</p> <ul style="list-style-type: none"> • Intel baseboard management controller (BMC) with Intelligent Platform Management Interface (IPMI) 2.0 compliant firmware • ATI ES1000 video controller with 32 MB DDR2 SDRAM • Dual 10 Mb/100 Mb/1 GB network interface controllers • Wake on LAN support • I/O Controller with six Serial ATA (SATA) ports • Front panel connectors: <ul style="list-style-type: none"> – Two Universal Serial Bus (USB) 2.0 ports – One systems management serial port – VGA video port – Two Ethernet ports 	<p>Size (2U chassis):</p> <ul style="list-style-type: none"> • Height: 86 mm (3.386 inches) • Depth: 473 mm (18.6 inches) • Width: 446 mm (17.56 inches) • Maximum weight: 6.98 kg (15.5 lb) <p>Environment:</p> <ul style="list-style-type: none"> • Air temperature: <ul style="list-style-type: none"> – Server on: 10°C to 35°C (50°F to 95°F); altitude: 0 to 914.4 m (0 to 3000 ft). Derate maximum temperature by 1°C for every 304.8 m (1000 ft) increase in elevation to a maximum of 3,048.0 m (10000 ft) at an ambient temperature of 28°C. – Server off: 10°C to 43°C (59°F to 109.4°F); maximum altitude: 2133 m (7000 ft) • Humidity: <ul style="list-style-type: none"> – Server on: 10% to 80% – Server off: 8% to 80% <p>Electrical Input:</p> <ul style="list-style-type: none"> • Input voltage low range: 100 V ac (minimum) to 127 V ac (maximum), 50 to 60 Hz, sine-wave input • Input voltage high range: 200 V ac (minimum) to 240 V ac (maximum), 50 to 60 Hz, sine-wave input
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Operator panel controls, LEDs, and connectors

The following illustration shows the controls, LEDs, and connectors on the front of the dx360 system-board tray. The operator panel on the system-board tray is the same for all dx360 server configurations.



Power-control button: Press this button to turn the system-board tray on and off manually.

Note: You can also remove the power-control button cover for easier access to the power-control button.

Ethernet link activity/status LED: This LED is on each Ethernet connector. It indicates that there is an active connection on the Ethernet port. When this LED is flashing, it indicates that there is activity between the server and the network.

Ethernet connection speed LED: This LED is on each Ethernet connector. The status of this LED indicates the connection speed between the system-board tray and the network as follows:

- LED off: 10 Mbps connection
- LED lit Amber: 100 Mbps connection
- LED lit Green: 1000 Mbps connection

USB connectors: Connect USB 2.0 devices to these connectors.

Video connector: Connect a monitor to this connector.

Ethernet connectors: Use these connectors to connect the server to a network.

Systems management port: Connect a systems management device to this serial connector.

Locator LED: This LED can be lit remotely by the system administrator to aid in visually locating the server.

System-error LED: When this LED is lit, it indicates that a system error has occurred. The source of the error is logged in the BMC system-event log that is accessed in the BIOS Setup Utility program.

Hard disk drive activity LED: When this LED is flashing, it indicates that an associated hard disk drive is in use.

Power-on LED: When this LED is lit, it indicates that the system-board tray is turned on. When this LED is off, it indicates that ac power is not present or the power supply or the LED itself has failed.

Note: If this LED is off, it does not mean that no electrical power is present. The LED might be burned out. To remove all electrical power, you must disconnect the power cord from the chassis.

Turning on the system-board tray

After you install the system-board tray in a chassis, the system-board tray can start in any of the following ways:

- You can press the power-control button on the front of the system-board tray (see “Operator panel controls, LEDs, and connectors” on page 8) to start the server.
- You can turn on the system-board tray remotely by using the management appliance.
- If the system-board tray is connected to power (the power-on LED is flashing slowly), the operating system supports the Wake on LAN feature, and the Wake on LAN feature has not been disabled, the Wake on LAN feature can turn on the system-board tray.
- In an IPMI environment, the system administrator can turn on the system-board tray using the BMC IPMI **Chassis Control** command. See “Setting the BMC IP parameters” on page 146 for instructions to display or change baseboard management controller IP parameters.
- If a power failure occurs, the system-board tray can start automatically when power is restored, if it is configured to do so.

Turning off the system-board tray

When you turn off the system-board tray, it is still connected to ac power through the chassis power supply. The system-board tray still can respond to requests from the BMC, such as a remote request to turn on the system-board tray. To remove all power from the system-board tray, you must remove the tray from the chassis.

Shut down the operating system before you turn off the system-board tray. See the operating-system documentation for information about shutting down the operating system.

The system-board tray can be turned off in any of the following ways:

- You can press the power-control button on the front of the system-board tray (see “Operator panel controls, LEDs, and connectors” on page 8). This starts an orderly shutdown of the operating system, if this feature is supported by the operating system.
- You can turn off the system-board tray from the operating system, if the operating system supports this feature. After an orderly shutdown of the operating system, the system-board tray will be turned off automatically.
- In an IPMI environment, the system administrator can turn off the system-board tray by using the BMC IPMI **Chassis Control** command.
- If the operating system stops functioning, you can press and hold the power-control button for more than 4 seconds to turn off the system-board tray.
- You might be able to turn off the system-board tray by using an optional management appliance.
 - If the system is not operating correctly, the management appliance might automatically turn off the system-board tray.

- Through the management appliance control interface, you might also be able to configure the management appliance to turn off the system-board tray. For additional information, see the documentation for your management appliance.

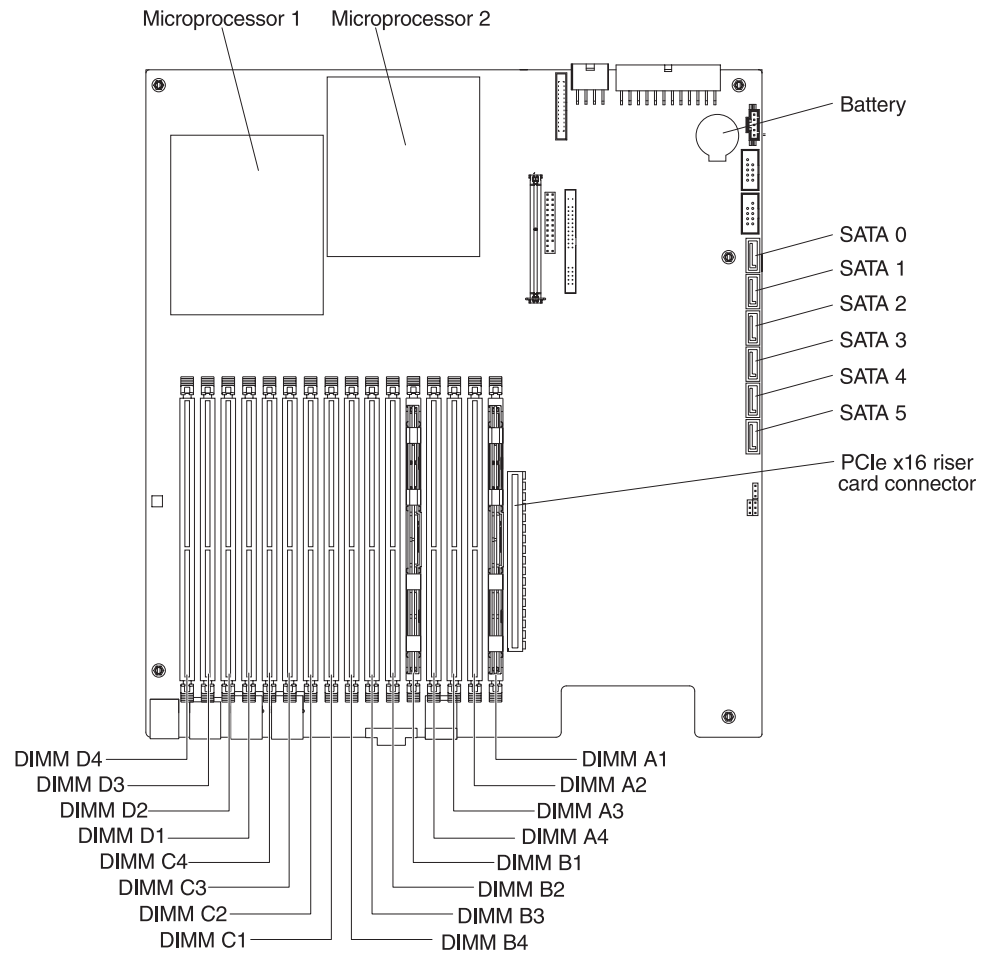
System-board layouts

The following illustrations show the connectors and jumpers on the dx360 system board.

Note: The illustrations in this document might differ slightly from your hardware.

System-board connectors

The following illustration shows the connectors on the dx360 system board.



System-board LEDs

The following illustration shows the locations of the LEDs on the system board.

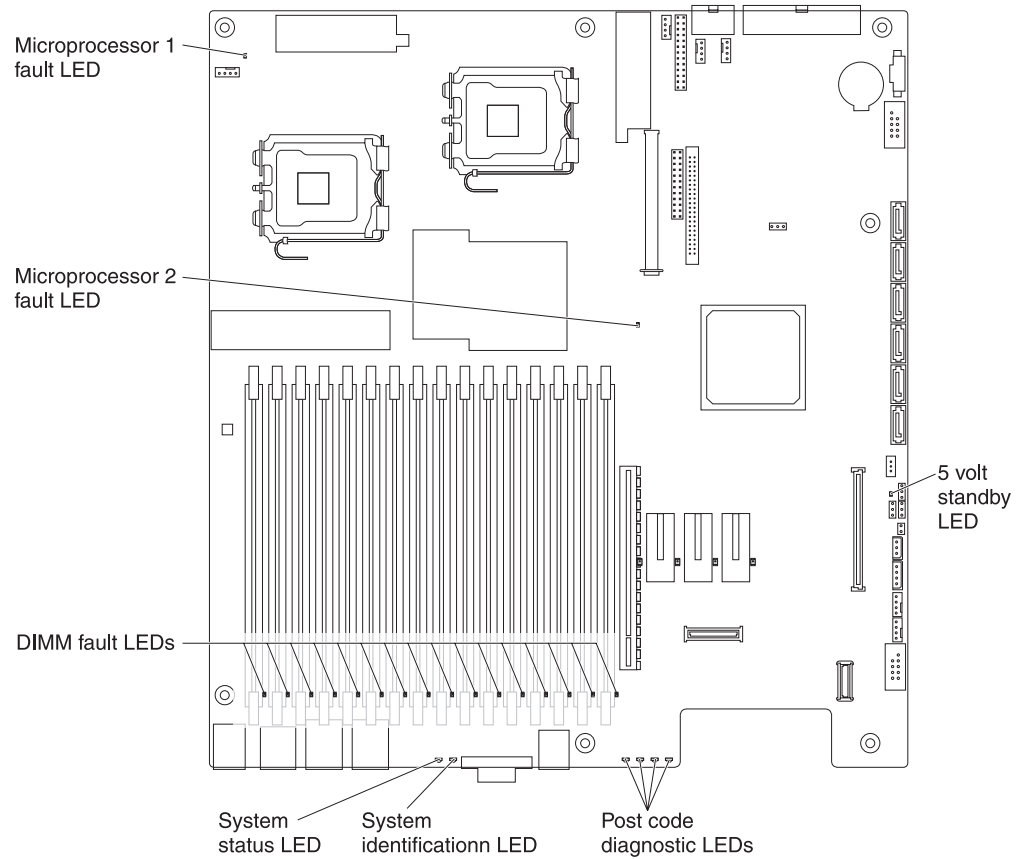


Table 2. System-board LEDs

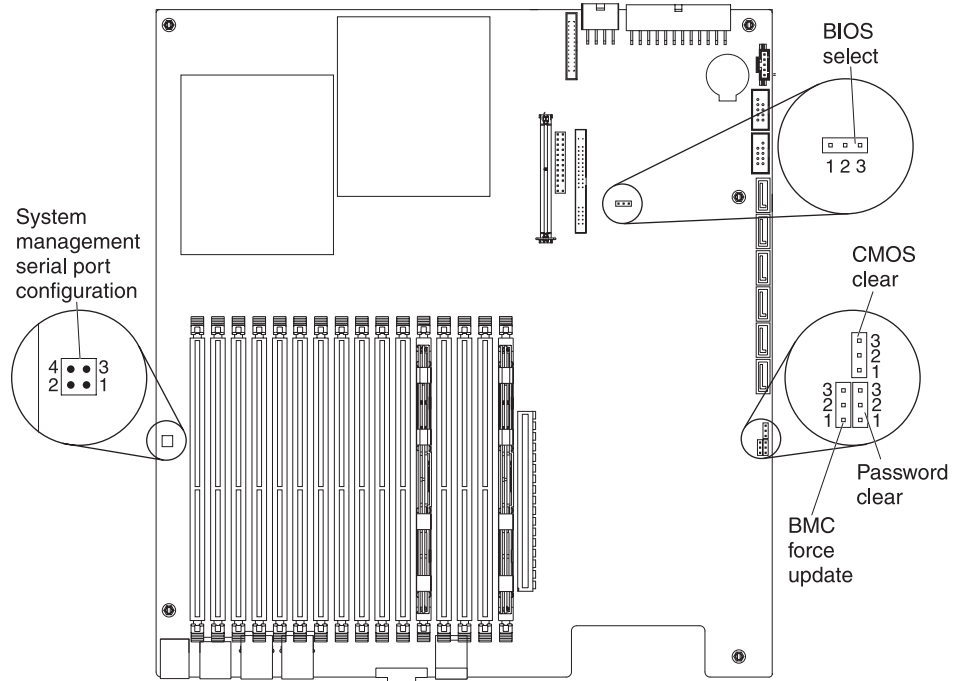
LED name	Description
Microprocessor 1 fault LED	When this LED is amber, it indicates that microprocessor 1 has been disabled or that a processor configuration error has been detected.
5 volt standby LED	When this LED is amber, it indicates that the server is connected to an ac power source and that the power supply has supplied the 5 volt standby voltage to the system board.
POST code diagnostic LEDs	For debug use only.
System Identification LED	This LED helps identify the server from other servers. The default for System Identification LED is OFF. When this LED is lit and blue, it indicates that a software program has activated it.

Table 2. System-board LEDs (continued)

LED name	Description
System status LED	<ul style="list-style-type: none"> • When this LED is off, it indicates that the server is not connected to an ac power source. • When this LED is alternating between green and amber, it indicates that the BMC is initializing. • When this LED is green, it indicates that the server started without incident and is ready for use. • When this LED is green and blinking, it indicates any of the following: <ul style="list-style-type: none"> – The server performance is decreased. – The server is unable to use all of the memory installed (when more than one DIMM is installed). – PCI Express link error occurred. – A CPU failure: disabled, if two processors are installed and one failed. – A fan alarm: fan failure. The number of working fans must be more than the minimum needed to cool the server. – A non-critical threshold was crossed: temperature and voltage. • When this LED is amber and blinking, it indicates any of the following: <ul style="list-style-type: none"> – A non-fatal alarm: the server might fail. – A critical voltage threshold was exceeded. – The VRD signal or connection was established. – The server did not have the minimum number of fans required to cool the server or a fan failed. • When this LED is amber continuously, it indicates any of the following: <ul style="list-style-type: none"> – A fatal alarm: server has failed or shutdown. – A DIMM failure when one DIMM is installed; no good memory. – A run-time memory uncorrectable error occurred in non-redundant mode. – An IERR signal was established. – Processor 1 is missing. – The temperature (CPU ThermTrip, memory TempHi, critical threshold is exceeded). – No good power: power fault. – Processor configuration error (for example, processor stepping mismatch).
DIMM fault LEDs	When this LED is amber, it indicates that a memory DIMM has failed.
Microprocessor 2 fault LED	When this LED is amber, it indicates that microprocessor 2 has been disabled or that a processor configuration error has been detected.

System-board jumpers

The following illustration shows the locations of the jumpers on the dx360 system board.



The following table defines the function of each jumper on the system board.

Jumper or switch number	Description
BIOS Select	<ul style="list-style-type: none"> • Pins 1 and 2: Force BIOS to bank 0 • Pins 2 and 3: System configured for normal operation (default) <p>Note: When performing a BIOS update procedure, the BIOS Select jumper must be set to the default position (pins 2 and 3). See “Updating (flash-updating) the BIOS code” on page 82 and “Recovering from a BIOS update failure” on page 83 for more information.</p>
BMC Force Update	<ul style="list-style-type: none"> • Pins 1 and 2: Disable BMC firmware force update (default) • Pins 2 and 3: Enable BMC firmware force update
CMOS Clear	<ul style="list-style-type: none"> • Pins 1 and 2: Keep CMOS data (default) • Pins 2 and 3: Clear CMOS data
Password Clear	<ul style="list-style-type: none"> • Pins 1 and 2: Keep password data (default) • Pins 2 and 3: Clear password data <p>Note: Setting the Password Clear jumper to pins 2 and 3 immediately clears both administrator and user passwords.</p>

Jumper or switch number	Description
Systems Management Serial Port Configuration	<p>The Systems Management Serial Port Configuration jumper configures either a Data Set Ready (DSR) or Data Carrier Detect (DCD) signal to the external serial connector.</p> <ul style="list-style-type: none">• Pins 1 and 2: DCD to Data Terminal Ready (DTR)• Pins 3 and 4: DSR to DTR (default)

Chapter 3. Diagnostics

This section describes the diagnostic tools that are available to help you solve problems that might occur in the system-board tray and chassis.

To update the firmware, you might have to use an external USB CD-RW/DVD drive. To run the BIOS Setup Utility or the Dynamic System Analysis (DSA) Preboot diagnostic programs, you must have the following additional hardware:

- Monitor
- Combination USB keyboard and pointing device such as IBM part number 40K5372
- External USB CD-RW/DVD drive such as the IBM and Lenovo part number 73P4515 or 73P4516

If you cannot diagnose and correct a problem by using the information in this section, see Appendix A, “Getting help and technical assistance,” on page 149 for more information.

Diagnostic tools

The following tools are available to help you diagnose and solve hardware-related problems:

- **POST beep codes, error messages, and error logs**

The power-on self-test (POST) generates beep codes and messages to indicate successful test completion or the detection of a problem. See “POST” on page 16 for more information.

- **Checkout procedures**

Checkout procedures are available to help you diagnose server problems. The basic checkout procedure is designed for anyone to use. The advanced checkout procedure is intended for trained service technicians only. See “Checkout procedure” on page 54 for more information.

- **Troubleshooting tables**

These tables list problem symptoms and actions to correct the problems. See “Troubleshooting tables” on page 57 for more information.

- **Dynamic System Analysis (DSA) Preboot diagnostic programs**

The DSA Preboot diagnostic programs collect and analyze system information to aid in diagnosing problems. See “Diagnostic programs, messages, and error codes” on page 63 for more information.

POST

When you turn on the system-board tray, it performs a series of tests to check the operation of the components and some optional devices in the chassis. This series of tests is called the power-on self-test, or POST.

If administrator or user passwords are set, you must type the password and press Enter, when you are prompted, for POST to run.

If POST detects a problem, more than one beep might sound, or an error message is displayed. See “POST beep code descriptions” and “POST error codes” on page 18 for more information.

POST beep codes

A beep code is a combination of short or long beeps or a series of short beeps that are separated by pauses. For example, a “1-2-3” beep code is one short beep, a pause, two short beeps, a pause, and three short beeps. To determine the meaning of a beep code, see “POST beep code descriptions” or “BMC beep code descriptions” on page 17.

POST beep code descriptions

The following table describes the power-on self test (POST) beep codes and suggested actions to correct the detected problems.

A single problem might cause more than one error message. When this occurs, correct the cause of the first error message. The other error messages usually will not occur the next time POST runs.

Exception: If multiple error codes indicate a microprocessor error, the error might be in a microprocessor or in a microprocessor socket. See “Microprocessor problems” on page 60 for information about diagnosing microprocessor problems.

Table 3. POST beep codes

<ul style="list-style-type: none">• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.• See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).• If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.		
Beep code	Description	Action
Three short beeps	Memory error. The system halted because a fatal memory error was detected.	<ol style="list-style-type: none">1. Check the system board for lit memory DIMM diagnostic LEDs.2. If a memory diagnostic LED is lit, reseal the affected DIMM.3. Restart the system-board tray.4. If the problem remains, replace the affected DIMM .
Six short beeps	BIOS rolling-back error. The system has detected a corrupted BIOS and is rolling-back to the last good BIOS.	<p>The system is running the backup BIOS.</p> <ol style="list-style-type: none">1. Update the BIOS to the latest version.2. See “Firmware updates” on page 145 for more information.

BMC beep code descriptions

A BMC beep code is a combination of short or long beeps or series of short beeps that are separated by pauses. For example, a “1-2-3-2” beep code is one short beep, a pause, two short beeps, and pause, three short beeps, and pause, and two short beeps. The baseboard management controller (BMC) will generate beep codes when it detects problems. The BMC beep codes will sound each time you turn on the server, if a problem is detected.

The following table lists the BMC beep codes that sound when you turn on the server and a problem is detected.

Table 4. BMC beep codes

Beep code	Description	Action
1-5-2-1	CPU: Empty slot/population error - Processor slot 1 is not populated.	A microprocessor must be installed in slot 1.
1-5-4-2	Power fault: DC power unexpectedly lost (power good dropout)	<ol style="list-style-type: none"> 1. Make sure that the power supply cord is connected correctly to the server and to a working electrical outlet. 2. Replace the chassis power supply. 3. (Trained service technician only) Replace the system board.
1-5-4-4	Power control fault failure.	<ol style="list-style-type: none"> 1. Replace the chassis power supply. 2. (Trained service technician only) Replace the system board.

POST error codes

POST issues three types of POST error messages:

Minor This error message is displayed on the monitor or in the Error Manager screen. The server will continue to start, but with reduced function. You can choose to replace the component that caused the error. The POST Error Pause option setting in BIOS setup has no effect on this error.

Major This error message is displayed in the Error Manager screen and is logged to the system event log (SEL). The POST Error Pause option setting in BIOS setup controls whether the server pauses in Error Manager, at which time you can correct the problem or continue to start the server.

Fatal This error message is displayed in the Error Manager screen and is logged to the system event log (SEL). The server will not start until the error is corrected. Replace the component that caused the error and restart the server. The POST Error Pause option setting in BIOS setup has no control on the server to pause in Error Manager.

The following table describes the POST error codes and suggested actions to correct the detected problems.

Table 5. POST error codes

<ul style="list-style-type: none"> Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 			
Error code	Description	Response type	Action
0012	CMOS date and time not set.	Major	<ol style="list-style-type: none"> Enter the CMOS date and time using the BIOS Setup Utility. Replace the CMOS lithium battery, if necessary. (Trained service technician only) Replace the system board.
0048	Password check failed.	Fatal	<ol style="list-style-type: none"> Enter the correct password. Clear the password using the Password Clear jumper. See “Clearing passwords” on page 81 for information on resetting passwords. Restart the server and enter a new system password in BIOS Setup.
0108	Keyboard component encountered a lock error.	Minor	<ol style="list-style-type: none"> Restart the server with a known working keyboard. Replace the keyboard, if necessary.

Table 5. POST error codes (continued)

<ul style="list-style-type: none"> • Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. • See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). • If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 			
Error code	Description	Response type	Action
0140	PCI component encountered a PERR error.	Major	<ol style="list-style-type: none"> 1. Make sure that the PCI Express adapter is properly seated in the PCI slot. 2. Make sure that the PCI Express adapter device drivers are installed and updated. 3. If the problem remains, replace the PCI Express adapter. 4. (Trained service technician only) Replace the system board.
0141	PCI resource conflict error.	Major	<ol style="list-style-type: none"> 1. Set the BIOS Setup option to automatically configure the PCI resources. 2. Update the system BIOS to the latest version. See “Updating (flash-updating) the BIOS code” on page 82 for more information.
0146	Insufficient memory to shadow PCI ROM.	Major	<ol style="list-style-type: none"> 1. Disable network boot using Boot Options in the BIOS Setup Utility. See “Using the BIOS Setup Utility program” on page 141 for more information. 2. Remove any additional PCI add-in cards that might be consuming ROM area.
0192	L3 cache size mismatch.	Fatal	<ol style="list-style-type: none"> 1. Make sure that both of the microprocessors have matching cache sizes (for example: 12 MB last level cache). Both microprocessors must match for proper operation. 2. (Trained service technician only) Replace the microprocessor.
0194	CPUID, processor family are different.	Fatal	<ol style="list-style-type: none"> 1. Make sure that both microprocessors have matching microprocessor numbers (for example, Intel® Xeon® E5472 microprocessor). 2. (Trained service technician only) Replace the microprocessor.

Table 5. POST error codes (continued)

<ul style="list-style-type: none"> Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 			
Error code	Description	Response type	Action
0195	Front side bus mismatch.	Fatal	<ol style="list-style-type: none"> Make sure that both microprocessors have matching front side bus speeds (for example, 1600 MHz, or 1333 MHz). Both microprocessors must match for proper operation. (Trained service technician only) Replace the microprocessor.
0196	Processor model mismatch.	Major	<ol style="list-style-type: none"> Make sure that both microprocessors have matching microprocessor numbers (for example, Intel Xeon E5472 microprocessor). Both microprocessors must match for proper operation. (Trained service technician only) Replace the microprocessor.
0197	Processor speeds mismatched.	Major	<ol style="list-style-type: none"> Make sure that both microprocessors have matching microprocessor numbers (for example, Intel Xeon E5472 microprocessor). Both microprocessors must match for proper operation. (Trained service technician only) Replace the microprocessor.
0198	Processor family is unsupported.	Major	<ol style="list-style-type: none"> The server supports only Intel Xeon 5400 and 5200 series microprocessors. See the Chapter 4, “Parts listing,” on page 87 for a list of supported microprocessors for the server. (Trained service technician only) Replace the microprocessor.
5220	CMOS/NVRAM configuration cleared.	Major	<ol style="list-style-type: none"> Displayed when CMOS/NVRAM is cleared in the BIOS Setup menu. Reset the BIOS Setup values to the Default Values (as desired) and restart the server.

Table 5. POST error codes (continued)

<ul style="list-style-type: none"> • Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. • See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). • If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 			
Error code	Description	Response type	Action
5221	Passwords cleared by jumper.	Major	<ol style="list-style-type: none"> 1. Displayed when the Password Reset jumper on the system board is set to the reset position. 2. Reset the Password Reset jumper to the normal position for normal operation. See “Clearing passwords” on page 81 for more information.
5224	Password clear jumper is set.	Major	<ol style="list-style-type: none"> 1. Displayed when the Password Reset jumper on the system board is set to the reset position. 2. Reset the Password Reset jumper to the normal position for normal operation. See “Clearing passwords” on page 81 for more information.
8110	Processor 01 internal error (IERR) on last boot.	Major	<p>An IERR error can be caused by various sources, including PCI add-in cards.</p> <ol style="list-style-type: none"> 1. Make sure that the PCI add-in card is properly installed with the latest device driver updates. 2. Replace the PCI card or I/O device. 3. (Trained service technician only) Replace the microprocessor.
8111	Processor 02 internal error (IERR) on last boot.	Major	<p>An IERR error can be caused by various sources, including the PCI add-in card.</p> <ol style="list-style-type: none"> 1. Make sure that the PCI add-in card is properly installed with the latest device driver updates. 2. Replace the PCI card or I/O device. 3. (Trained service technician only) Replace the microprocessor.

Table 5. POST error codes (continued)

<ul style="list-style-type: none"> Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 			
Error code	Description	Response type	Action
8120	Processor 01 thermal trip error on last boot.	Major	<p>Make sure that:</p> <ul style="list-style-type: none"> There are no fan failure messages in the system event log. If there is a fan failure, replace the fan assembly. The environmental ambient temperature is not abnormal. A normal software workload is running. The microprocessor heat sink is installed correctly. (Trained service technician only) Replace the microprocessor.
8121	Processor 02 thermal trip error on last boot.	Major	<p>Make sure that:</p> <ul style="list-style-type: none"> There are no fan failure messages in the system event log. If there is a fan failure, replace the fan assembly. The environmental ambient temperature is not abnormal. A normal software workload is running. The microprocessor heat sink is installed correctly. (Trained service technician only) Replace the microprocessor.
8130	Processor 01 disabled.	Major	<ol style="list-style-type: none"> Make sure that the microprocessor is enabled in the system BIOS Setup. (Trained service technician only) Make sure that the microprocessor is installed correctly and that the heat sink assembly is installed correctly. Start the server again.
8131	Processor 02 disabled.	Major	<ol style="list-style-type: none"> Make sure that the microprocessor is enabled in the system BIOS Setup. (Trained service technician only) Make sure that the microprocessor is installed correctly and that the heat sink assembly is installed correctly. Start the server again.

Table 5. POST error codes (continued)

<ul style="list-style-type: none"> • Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. • See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). • If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 			
Error code	Description	Response type	Action
8140	Processor 01 failed FRB-3 Timer.	Minor	Fault Resilient Boot (FRB) "three-strike" error detected. <ol style="list-style-type: none"> 1. Set the microprocessor in the BIOS Setup to retest on next boot to clear the error. 2. Start the server again. 3. (Trained service technician only) Replace the microprocessor.
8141	Processor 02 failed FRB-3 Timer.	Minor	Fault Resilient Boot (FRB) "three-strike" error detected. <ol style="list-style-type: none"> 1. Set the microprocessor in the BIOS Setup to retest on next boot to clear the error. 2. Start the server again. 3. (Trained service technician only) Replace the microprocessor.
8160	Processor 01 unable to apply BIOS update.	Major	<ol style="list-style-type: none"> 1. Make sure that the correct firmware update package is being applied. 2. Update the server using the latest firmware update package. See “Updating (flash-updating) the BIOS code” on page 82 for more information.
8161	Processor 02 unable to apply BIOS update.	Major	<ol style="list-style-type: none"> 1. Make sure that the correct firmware update package is being applied. 2. Update the server using the latest firmware update package. See “Updating (flash-updating) the BIOS code” on page 82 for more information.

Table 5. POST error codes (continued)

<ul style="list-style-type: none"> • Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. • See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). • If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 			
Error code	Description	Response type	Action
8170	Processor 01 failed Self Test (BIST).	Major	<ol style="list-style-type: none"> 1. Make sure that the microprocessor is enabled in the system BIOS Setup. 2. (Trained service technician only) Make sure that the microprocessor is installed correctly and that the heat sink assembly is installed correctly. 3. Start the server again to run the test. 4. (Trained service technician only) Swap the microprocessor with one that is known to work, replace the microprocessor, if necessary.
8171	Processor 02 failed Self Test (BIST).	Major	<ol style="list-style-type: none"> 1. Make sure that the microprocessor is enabled in the system BIOS Setup. 2. (Trained service technician only) Make sure that the microprocessor is installed correctly and that the heat sink assembly is installed correctly. 3. Start the server again to run the test. 4. (Trained service technician only) Swap the microprocessor with one that is known to work, replace the microprocessor, if necessary.
8180	Processor 01 BIOS does not support the current stepping for processor.	Minor	Update the system BIOS to the latest version. See “Updating (flash-updating) the BIOS code” on page 82 for more information.
8181	Processor 02 BIOS does not support the current stepping for processor.	Minor	Update the system BIOS to the latest version. See “Updating (flash-updating) the BIOS code” on page 82 for more information.

Table 5. POST error codes (continued)

<ul style="list-style-type: none"> Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 			
Error code	Description	Response type	Action
8190	Watchdog timer failed on last boot.	Major	<ol style="list-style-type: none"> Power-off the server; then, restart the server. Update the server BIOS, BMC, and FRU/SDR firmware using the latest firmware update package. See “Firmware updates” on page 145 and “Updating (flash-updating) the BIOS code” on page 82 for more information. (Trained service technician only) Replace the system board.
8198	Operating system boot watchdog timer expired on last boot	Major	<ol style="list-style-type: none"> Power-off the server; then, restart the server. Update the server BIOS, BMC, and FRU/SDR firmware using the latest firmware update package. See “Firmware updates” on page 145 and “Updating (flash-updating) the BIOS code” on page 82 for more information. (Trained service technician only) Replace the system board.
8300	Baseboard management controller failed self-test.	Major	<ol style="list-style-type: none"> Start the server again. Update the server BIOS, BMC, and FRU/SDR firmware using the latest firmware update package. See “Firmware updates” on page 145 and “Updating (flash-updating) the BIOS code” on page 82 for more information. (Trained service technician only) Replace the system board, if necessary.
84F2	Baseboard management controller failed to respond.	Major	<ol style="list-style-type: none"> Start the server again. Update the server BIOS, BMC, and FRU/SDR firmware using the latest firmware update package. See “Updating (flash-updating) the BIOS code” on page 82 for more information. (Trained service technician only) Replace the system board, if necessary.

Table 5. POST error codes (continued)

<ul style="list-style-type: none"> Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 			
Error code	Description	Response type	Action
84F3	Baseboard management controller in update mode.	Major	Update the server BIOS, BMC, and FRU/SDR firmware using the latest firmware update package. See “Updating (flash-updating) the BIOS code” on page 82 for more information.
84F4	Sensor data record empty.	Major	Update the server BIOS, BMC, and FRU/SDR firmware using the latest firmware update package. See “Updating (flash-updating) the BIOS code” on page 82 for more information.
84FF	System event log full.	Minor	Clear the system event log in BIOS Setup to free up space. See “Viewing the BMC system event log using the SELView Utility” on page 52 for details.
85FD	Memory component could not be configured in the selected RAS mode.	Major	You must install matched DIMM sets across the channels to support memory mirroring. 1. Make sure that each memory channel is populated with matching DIMM configurations.
8520	DIMM_A1 failed Self Test (BIST).	Major	1. Make sure that the DIMM is installed correctly. 2. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. 3. Replace the DIMM.
8521	DIMM_A2 failed Self Test (BIST).	Major	1. Make sure that the DIMM is installed correctly. 2. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. 3. Replace the DIMM.

Table 5. POST error codes (continued)

<ul style="list-style-type: none"> • Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. • See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). • If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 			
Error code	Description	Response type	Action
8522	DIMM_A3 failed Self Test (BIST).	Major	<ol style="list-style-type: none"> 1. Make sure that the DIMM is installed correctly. 2. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. 3. Replace the DIMM.
8523	DIMM_A4 failed Self Test (BIST).	Major	<ol style="list-style-type: none"> 1. Make sure that the DIMM is installed correctly. 2. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. 3. Replace the DIMM.
8524	DIMM_B1 failed Self Test (BIST).	Major	<ol style="list-style-type: none"> 1. Make sure that the DIMM is installed correctly. 2. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. 3. Replace the DIMM.
8525	DIMM_B2 failed Self Test (BIST).	Major	<ol style="list-style-type: none"> 1. Make sure that the DIMM is installed correctly. 2. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. 3. Replace the DIMM.
8526	DIMM_B3 failed Self Test (BIST).	Major	<ol style="list-style-type: none"> 1. Make sure that the DIMM is installed correctly. 2. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. 3. Replace the DIMM.

Table 5. POST error codes (continued)

<ul style="list-style-type: none"> • Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. • See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). • If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 			
Error code	Description	Response type	Action
8527	DIMM_B4 failed Self Test (BIST).	Major	<ol style="list-style-type: none"> 1. Make sure that the DIMM is installed correctly. 2. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. 3. Replace the DIMM.
8528	DIMM_C1 failed Self Test (BIST).	Major	<ol style="list-style-type: none"> 1. Make sure that the DIMM is installed correctly. 2. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. 3. Replace the DIMM.
8529	DIMM_C2 failed Self Test (BIST).	Major	<ol style="list-style-type: none"> 1. Make sure that the DIMM is installed correctly. 2. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. 3. Replace the DIMM.
852A	DIMM_C3 failed Self Test (BIST).	Major	<ol style="list-style-type: none"> 1. Make sure that the DIMM is installed correctly. 2. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. 3. Replace the DIMM.
852B	DIMM_C4 failed Self Test (BIST).	Major	<ol style="list-style-type: none"> 1. Make sure that the DIMM is installed correctly. 2. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. 3. Replace the DIMM.

Table 5. POST error codes (continued)

<ul style="list-style-type: none"> Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 			
Error code	Description	Response type	Action
852C	DIMM_D1 failed Self Test (BIST).	Major	<ol style="list-style-type: none"> Make sure that the DIMM is installed correctly. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. Replace the DIMM.
852D	DIMM_D2 failed Self Test (BIST).	Major	<ol style="list-style-type: none"> Make sure that the DIMM is installed correctly. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. Replace the DIMM.
852E	DIMM_D3 failed Self Test (BIST).	Major	<ol style="list-style-type: none"> Make sure that the DIMM is installed correctly. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. Replace the DIMM.
852F	DIMM_D4 failed Self Test (BIST).	Major	<ol style="list-style-type: none"> Make sure that the DIMM is installed correctly. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. Replace the DIMM.
8540	DIMM_A1 disabled.	Major	<ol style="list-style-type: none"> Make sure that the DIMM is installed correctly. Make sure that the DIMM is enabled in BIOS Setup. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. Replace the DIMM.

Table 5. POST error codes (continued)

<ul style="list-style-type: none"> Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 			
Error code	Description	Response type	Action
8541	DIMM_A2 disabled.	Major	<ol style="list-style-type: none"> 1. Make sure that the DIMM is installed correctly. 2. Make sure that the DIMM is enabled in BIOS Setup. 3. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. 4. Replace the DIMM.
8542	DIMM_A3 disabled.	Major	<ol style="list-style-type: none"> 1. Make sure that the DIMM is installed correctly. 2. Make sure that the DIMM is enabled in BIOS Setup. 3. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. 4. Replace the DIMM.
8543	DIMM_A4 disabled.	Major	<ol style="list-style-type: none"> 1. Make sure that the DIMM is installed correctly. 2. Make sure that the DIMM is enabled in BIOS Setup. 3. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. 4. Replace the DIMM.
8544	DIMM_B1 disabled.	Major	<ol style="list-style-type: none"> 1. Make sure that the DIMM is installed correctly. 2. Make sure that the DIMM is enabled in BIOS Setup. 3. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. 4. Replace the DIMM.

Table 5. POST error codes (continued)

<ul style="list-style-type: none"> • Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. • See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). • If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 			
Error code	Description	Response type	Action
8545	DIMM_B2 disabled.	Major	<ol style="list-style-type: none"> 1. Make sure that the DIMM is installed correctly. 2. Make sure that the DIMM is enabled in BIOS Setup. 3. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. 4. Replace the DIMM.
8546	DIMM_B3 disabled.	Major	<ol style="list-style-type: none"> 1. Make sure that the DIMM is installed correctly. 2. Make sure that the DIMM is enabled in BIOS Setup. 3. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. 4. Replace the DIMM.
8547	DIMM_B4 disabled.	Major	<ol style="list-style-type: none"> 1. Make sure that the DIMM is installed correctly. 2. Make sure that the DIMM is enabled in BIOS Setup. 3. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. 4. Replace the DIMM.
8548	DIMM_C1 disabled.	Major	<ol style="list-style-type: none"> 1. Make sure that the DIMM is installed correctly. 2. Make sure that the DIMM is enabled in BIOS Setup. 3. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. 4. Replace the DIMM.

Table 5. POST error codes (continued)

<ul style="list-style-type: none"> Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 			
Error code	Description	Response type	Action
8549	DIMM_C2 disabled.	Major	<ol style="list-style-type: none"> 1. Make sure that the DIMM is installed correctly. 2. Make sure that the DIMM is enabled in BIOS Setup. 3. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. 4. Replace the DIMM.
854A	DIMM_C3 disabled.	Major	<ol style="list-style-type: none"> 1. Make sure that the DIMM is installed correctly. 2. Make sure that the DIMM is enabled in BIOS Setup. 3. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. 4. Replace the DIMM.
854B	DIMM_C4 Disabled.	Major	<ol style="list-style-type: none"> 1. Make sure that the DIMM is installed correctly. 2. Make sure that the DIMM is enabled in BIOS Setup. 3. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. 4. Replace the DIMM.
854C	DIMM_D1 disabled.	Major	<ol style="list-style-type: none"> 1. Make sure that the DIMM is installed correctly. 2. Make sure that the DIMM is enabled in BIOS Setup. 3. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. 4. Replace the DIMM.

Table 5. POST error codes (continued)

<ul style="list-style-type: none"> • Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. • See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). • If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 			
Error code	Description	Response type	Action
854D	DIMM_D2 disabled.	Major	<ol style="list-style-type: none"> 1. Make sure that the DIMM is installed correctly. 2. Make sure that the DIMM is enabled in BIOS Setup. 3. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. 4. Replace the DIMM.
854E	DIMM_D3 disabled.	Major	<ol style="list-style-type: none"> 1. Make sure that the DIMM is installed correctly. 2. Make sure that the DIMM is enabled in BIOS Setup. 3. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. 4. Replace the DIMM.
854F	DIMM_D4 disabled.	Major	<ol style="list-style-type: none"> 1. Make sure that the DIMM is installed correctly. 2. Make sure that the DIMM is enabled in BIOS Setup. 3. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. 4. Replace the DIMM.

Table 5. POST error codes (continued)

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Error code	Description	Response type	Action
8550	CLTT configuration failed. Defaulting to OLTT	Major	<ol style="list-style-type: none"> 1. Make sure that the DIMM is installed correctly. 2. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. 3. Make sure that there is proper airflow within chassis (all system fans working). 4. OLTT (Open-Loop Thermal Throttling) will be enabled when CLTT (Closed-Loop Thermal Throttling) is disabled. 5. Replace the DIMM.
8560	DIMM_A1 component encountered a Serial Presence Detection (SPD) fail error.	Major	<ol style="list-style-type: none"> 1. Make sure that the DIMM is installed correctly. 2. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. 3. Replace the DIMM.
8561	DIMM_A2 component encountered a Serial Presence Detection (SPD) fail error.	Major	<ol style="list-style-type: none"> 1. Make sure that the DIMM is installed correctly. 2. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. 3. Replace the DIMM.
8562	DIMM_A3 component encountered a Serial Presence Detection (SPD) fail error.	Major	<ol style="list-style-type: none"> 1. Make sure that the DIMM is installed correctly. 2. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. 3. Replace the DIMM.

Table 5. POST error codes (continued)

<ul style="list-style-type: none"> • Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. • See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). • If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 			
Error code	Description	Response type	Action
8563	DIMM_A4 component encountered a Serial Presence Detection (SPD) fail error.	Major	<ol style="list-style-type: none"> 1. Make sure that the DIMM is installed correctly. 2. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. 3. Replace the DIMM.
8564	DIMM_B1 component encountered a Serial Presence Detection (SPD) fail err	Major	<ol style="list-style-type: none"> 1. Make sure that the DIMM is installed correctly. 2. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. 3. Replace the DIMM.
8565	DIMM_B2 component encountered a Serial Presence Detection (SPD) fail error.	Major	<ol style="list-style-type: none"> 1. Make sure that the DIMM is installed correctly. 2. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. 3. Replace the DIMM.
8566	DIMM_B3 component encountered a Serial Presence Detection (SPD) fail error.	Major	<ol style="list-style-type: none"> 1. Make sure that the DIMM is installed correctly. 2. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. 3. Replace the DIMM.
8567	DIMM_B4 component encountered a Serial Presence Detection (SPD) fail error.	Major	<ol style="list-style-type: none"> 1. Make sure that the DIMM is installed correctly. 2. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. 3. Replace the DIMM.

Table 5. POST error codes (continued)

<ul style="list-style-type: none"> Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 			
Error code	Description	Response type	Action
8568	DIMM_C1 component encountered a Serial Presence Detection (SPD) fail error.	Major	<ol style="list-style-type: none"> Make sure that the DIMM is installed correctly. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. Replace the DIMM.
8569	DIMM_C2 component encountered a Serial Presence Detection (SPD) fail error.	Major	<ol style="list-style-type: none"> Make sure that the DIMM is installed correctly. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. Replace the DIMM.
856A	DIMM_C3 component encountered a Serial Presence Detection (SPD) fail error.	Major	<ol style="list-style-type: none"> Make sure that the DIMM is installed correctly. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. Replace the DIMM.
856B	DIMM_C4 component encountered a Serial Presence Detection (SPD) fail error	Major	<ol style="list-style-type: none"> Make sure that the DIMM is installed correctly. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. Replace the DIMM.
856C	DIMM_D1 component encountered a Serial Presence Detection (SPD) fail error.	Major	<ol style="list-style-type: none"> Make sure that the DIMM is installed correctly. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. Replace the DIMM.

Table 5. POST error codes (continued)

<ul style="list-style-type: none"> Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 			
Error code	Description	Response type	Action
856D	DIMM_D2 component encountered a Serial Presence Detection (SPD) fail error.	Major	<ol style="list-style-type: none"> Make sure that the DIMM is installed correctly. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. Replace the DIMM.
856E	DIMM_D3 component encountered a Serial Presence Detection (SPD) fail error.	Major	<ol style="list-style-type: none"> Make sure that the DIMM is installed correctly. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. Replace the DIMM.
856F	DIMM_D4 component encountered a Serial Presence Detection (SPD) fail error.	Major	<ol style="list-style-type: none"> Make sure that the DIMM is installed correctly. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. Replace the DIMM.
8580	DIMM_A1 correctable ECC error encountered.	Minor/Major after 10 errors	<p>The DIMM has detected an ECC correctable error.</p> <ol style="list-style-type: none"> Reseat the DIMM; then, verify if the DIMM continues to encounter an ECC correctable error. Replace the DIMM.
8581	DIMM_A2 correctable ECC error encountered.	Minor/Major after 10 errors	<p>The DIMM has detected an ECC correctable error.</p> <ol style="list-style-type: none"> Reseat the DIMM; then, verify if the DIMM continues to encounter an ECC correctable error. Replace the DIMM.
8582	DIMM_A3 correctable ECC error encountered.	Minor/Major after 10 errors	<p>The DIMM has detected an ECC correctable error.</p> <ol style="list-style-type: none"> Reseat the DIMM; then, verify if the DIMM continues to encounter an ECC correctable error. Replace the DIMM.

Table 5. POST error codes (continued)

<ul style="list-style-type: none"> Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 			
Error code	Description	Response type	Action
8583	DIMM_A4 correctable ECC error encountered.	Minor/Major after 10 errors	The DIMM has detected an ECC correctable error. 1. Reseat the DIMM; then, verify if the DIMM continues to encounter an ECC correctable error. 2. Replace the DIMM.
8584	DIMM_B1 correctable ECC error encountered.	Minor/Major after 10 errors	The DIMM has detected an ECC correctable error. 1. Reseat the DIMM; then, verify if the DIMM continues to encounter an ECC correctable error. 2. Replace the DIMM.
8585	DIMM_B2 correctable ECC error encountered.	Minor/Major after 10 errors	The DIMM has detected an ECC correctable error. 1. Reseat the DIMM; then, verify if the DIMM continues to encounter an ECC correctable error. 2. Replace the DIMM.
8586	DIMM_B3 correctable ECC error encountered.	Minor/Major after 10 errors	The DIMM has detected an ECC correctable error. 1. Reseat the DIMM; then, verify if the DIMM continues to encounter an ECC correctable error. 2. Replace the DIMM.
8587	DIMM_B4 correctable ECC error encountered.	Minor/Major after 10 errors	The DIMM has detected an ECC correctable error. 1. Reseat the DIMM; then, verify if the DIMM continues to encounter an ECC correctable error. 2. Replace the DIMM.
8588	DIMM_C1 correctable ECC error encountered.	Minor/Major after 10 errors	The DIMM has detected an ECC correctable error. 1. Reseat the DIMM; then, verify if the DIMM continues to encounter an ECC correctable error. 2. Replace the DIMM.
8589	DIMM_C2 correctable ECC error encountered.	Minor/Major after 10 errors	The DIMM has detected an ECC correctable error. 1. Reseat the DIMM; then, verify if the DIMM continues to encounter an ECC correctable error. 2. Replace the DIMM.

Table 5. POST error codes (continued)

<ul style="list-style-type: none"> Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 			
Error code	Description	Response type	Action
858A	DIMM_C3 correctable ECC error encountered.	Minor/Major after 10 errors	The DIMM has detected an ECC correctable error. 1. Reseat the DIMM; then, verify if the DIMM continues to encounter an ECC correctable error. 2. Replace the DIMM.
858B	DIMM_C4 correctable ECC error encountered.	Minor/Major after 10 errors	The DIMM has detected an ECC correctable error. 1. Reseat the DIMM; then, verify if the DIMM continues to encounter an ECC correctable error. 2. Replace the DIMM.
858C	DIMM_D1 correctable ECC error encountered.	Minor/Major after 10 errors	The DIMM has detected an ECC correctable error. 1. Reseat the DIMM; then, verify if the DIMM continues to encounter an ECC correctable error. 2. Replace the DIMM.
858D	DIMM_D2 correctable ECC error encountered.	Minor/Major after 10 errors	The DIMM has detected an ECC correctable error. 1. Reseat the DIMM; then, verify if the DIMM continues to encounter an ECC correctable error. 2. Replace the DIMM.
858E	DIMM_D3 correctable ECC error encountered.	Minor/Major after 10 errors	The DIMM has detected an ECC correctable error. 1. Reseat the DIMM; then, verify if the DIMM continues to encounter an ECC correctable error. 2. Replace the DIMM.
858F	DIMM_D4 correctable ECC error encountered.	Minor/Major after 10 errors	The DIMM has detected an ECC correctable error. 1. Reseat the DIMM; then, verify if the DIMM continues to encounter an ECC correctable error. 2. Replace the DIMM.
85A0	DIMM_A1 uncorrectable ECC error encountered.	Major	The DIMM has detected an uncorrectable ECC error. 1. Make sure that the DIMM is installed correctly. 2. Replace the DIMM with a known DIMM that works; then, replace DIMM, if necessary.

Table 5. POST error codes (continued)

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Error code	Description	Response type	Action
85A1	DIMM_A2 uncorrectable ECC error encountered.	Major	The DIMM has detected an uncorrectable ECC error. 1. Make sure that the DIMM is installed correctly. 2. Replace the DIMM.
85A2	DIMM_A3 uncorrectable ECC error encountered.	Major	The DIMM has detected an uncorrectable ECC error. 1. Make sure that the DIMM is installed correctly. 2. Replace the DIMM.
85A3	DIMM_A4 uncorrectable ECC error encountered.	Major	The DIMM has detected an uncorrectable ECC error. 1. Make sure that the DIMM is installed correctly. 2. Replace the DIMM.
85A4	DIMM_B1 uncorrectable ECC error encountered.	Major	The DIMM has detected an uncorrectable ECC error. 1. Make sure that the DIMM is installed correctly. 2. Replace the DIMM.
85A5	DIMM_B2 uncorrectable ECC error encountered.	Major	The DIMM has detected an uncorrectable ECC error. 1. Make sure that the DIMM is installed correctly. 2. Replace the DIMM.
85A6	DIMM_B3 uncorrectable ECC error encountered.	Major	The DIMM has detected an uncorrectable ECC error. 1. Make sure that the DIMM is installed correctly. 2. Replace the DIMM.
85A7	DIMM_B4 uncorrectable ECC error encountered.	Major	The DIMM has detected an uncorrectable ECC error. 1. Make sure that the DIMM is installed correctly. 2. Replace the DIMM.
85A8	DIMM_C1 uncorrectable ECC error encountered.	Major	The DIMM has detected an uncorrectable ECC error. 1. Make sure that the DIMM is installed correctly. 2. Replace the DIMM.

Table 5. POST error codes (continued)

<ul style="list-style-type: none"> • Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. • See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). • If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 			
Error code	Description	Response type	Action
85A9	DIMM_C2 uncorrectable ECC error encountered.	Major	The DIMM has detected an uncorrectable ECC error. 1. Make sure that the DIMM is installed correctly. 2. Replace the DIMM.
85AA	DIMM_C3 uncorrectable ECC error encountered.	Major	The DIMM has detected an uncorrectable ECC error. 1. Make sure that the DIMM is installed correctly. 2. Replace the DIMM.
85AB	DIMM_C4 uncorrectable ECC error encountered.	Major	The DIMM has detected an uncorrectable ECC error. 1. Make sure that the DIMM is installed correctly. 2. Replace the DIMM.
85AC	DIMM_D1 uncorrectable ECC error encountered.	Major	The DIMM has detected an uncorrectable ECC error. 1. Make sure that the DIMM is installed correctly. 2. Replace the DIMM.
85AD	DIMM_D2 uncorrectable ECC error encountered.	Major	The DIMM has detected an uncorrectable ECC error. 1. Make sure that the DIMM is installed correctly. 2. Replace the DIMM.
85AE	DIMM_D3 uncorrectable ECC error encountered.	Major	The DIMM has detected an uncorrectable ECC error. 1. Make sure that the DIMM is installed correctly. 2. Replace the DIMM.
85AF	DIMM_D4 uncorrectable ECC error encountered.	Major	The DIMM has detected an uncorrectable ECC error. 1. Make sure that the DIMM is installed correctly. 2. Replace the DIMM.

Table 5. POST error codes (continued)

<ul style="list-style-type: none"> • Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. • See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). • If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 			
Error code	Description	Response type	Action
85FC	Closed loop thermal throttling could not be configured, defaulting to open loop.	Major	<ol style="list-style-type: none"> 1. Make sure that the DIMM is installed correctly. 2. Make sure that the DIMM has a thermal sensor. 3. Make sure that the server supports the DIMM type and speed. See the Chapter 4, “Parts listing,” on page 87 for a list of supported DIMMs for the server. 4. Make sure that there is proper airflow within chassis (all system fans working). Note: OLTT (Open-Loop Thermal Throttling) will be enabled when CLTT (Closed-Loop Thermal Throttling) is disabled. 5. Replace the DIMM.
8601	Override jumper is set to force boot from lower alternate BIOS bank of flash ROM Minor.	Minor	<p>The BIOS Select jumper is set to positions 1 and 2. This causes the server to boot from lower (secondary) bank.</p> <ol style="list-style-type: none"> 1. Move the BIOS Select jumper to positions 2 and 3 for normal operation and to clear the error code.
8602	WatchDog timer expired (secondary BIOS may be bad!).	Minor	Update the system BIOS to the latest version. See “Updating (flash-updating) the BIOS code” on page 82 for more information.
8603	Secondary BIOS checksum fail.	Minor	Update the system BIOS to the latest version. See “Updating (flash-updating) the BIOS code” on page 82 for more information.
8604	Chipset Reclaim of non critical variables complete.	Minor	<ol style="list-style-type: none"> 1. Restart the server to see if the error remains. 2. Update the server BIOS, BMC, and FRU/SDR firmware using the latest firmware update package. See “Firmware updates” on page 145 and “Updating (flash-updating) the BIOS code” on page 82 for more information.

Table 5. POST error codes (continued)

<ul style="list-style-type: none"> • Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. • See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). • If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 			
Error code	Description	Response type	Action
9000	Unspecified processor component has encountered a non specific error.	Major	<ol style="list-style-type: none"> 1. Make sure that the processor re-test option is selected in BIOS Setup. 2. Check to see if the CPU fault LED is lit. 3. Restart the server to see if the error remains. 4. (Trained service technician only) Replace the microprocessor, if necessary.
9226	Keyboard component encountered a controller error.	Minor	<ol style="list-style-type: none"> 1. Make sure that the keyboard cable is connected correctly. 2. Start the server again to see if the problem remains. 3. Replace the keyboard. 4. (Trained service technician only) Replace the system board, if necessary.
9246	Mouse component encountered a controller error.	Minor	<ol style="list-style-type: none"> 1. Make sure that the cable is connected correctly. 2. Start the server again to see if the problem remains. 3. Replace the mouse. 4. (Trained service technician only) Replace the system board, if necessary.
9266	Local Console component encountered a controller error.	Minor	<ol style="list-style-type: none"> 1. Make sure that the serial device cable is connected correctly. 2. Start the server again to see if the problem remains. 3. Replace the serial device; then, start the server again to see if the problem remains.
9268	Local Console component encountered an output error.	Minor	<ol style="list-style-type: none"> 1. Make sure that the serial device cable is connected correctly. 2. Start the server again to see if the problem remains. 3. Replace the serial device; then, start the server again to see if the problem remains.

Table 5. POST error codes (continued)

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Error code	Description	Response type	Action
9269	Local Console component encountered a resource conflict error.	Minor	<ol style="list-style-type: none"> 1. Make sure that the serial device cable is connected correctly. 2. Start the server again to see if the problem remains. 3. Replace the serial device; then, start the server again to see if the problem remains.
9286	Remote Console component encountered a controller error.	Minor	<ol style="list-style-type: none"> 1. Make sure that the serial device cable is connected correctly. 2. Start the server again to see if the problem remains. 3. Replace the serial device; then, start the server again to see if the problem remains.
9287	Remote Console component encountered an input error.	Minor	<ol style="list-style-type: none"> 1. Make sure that the serial device cable is connected correctly. 2. Start the server again to see if the problem remains. 3. Replace the serial device; then, start the server again to see if the problem remains.
9288	Remote Console component encountered an output error.	Minor	<ol style="list-style-type: none"> 1. Make sure that the serial device cable is connected correctly. 2. Start the server again to see if the problem remains. 3. Replace the serial device; then, start the server again to see if the problem remains.
92A3	Serial port component was not detected.	Major	<ol style="list-style-type: none"> 1. Make sure that the serial device cable is connected correctly. 2. Make sure that the cable that is being used is the correct cable. 3. Start the server again to see if the problem remains. 4. (Trained service technician only) Replace the system board, if necessary.

Table 5. POST error codes (continued)

<ul style="list-style-type: none"> • Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. • See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). • If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 			
Error code	Description	Response type	Action
92A9	Serial port component encountered a resource conflict error.	Major	<ol style="list-style-type: none"> 1. Make sure that the serial device cable is connected correctly. 2. Make sure that the cable that is being used is the correct cable. 3. Start the server again to see if the problem remains. 4. (Trained service technician only) Replace the system board, if necessary.
92C6	Serial Port controller error.	Minor	<ol style="list-style-type: none"> 1. Make sure that the serial device cable is connected correctly. 2. Start the server again to see if the problem remains. 3. (Trained service technician only) Replace the system board, if necessary.
92C7	Serial Port component encountered an input error.	Minor	<ol style="list-style-type: none"> 1. If present, make sure that the serial device cable is connected correctly. 2. Start the server again to see if the problem remains. 3. (Trained service technician only) Replace the system board, if necessary.
92C8	Serial Port component encountered an output error.	Minor	<ol style="list-style-type: none"> 1. If present, make sure that the serial device cable is connected correctly. 2. Start the server again to see if the problem remains. 3. (Trained service technician only) Replace the system board, if necessary.

Table 5. POST error codes (continued)

<ul style="list-style-type: none"> Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 			
Error code	Description	Response type	Action
94C6	LPC component encountered a controller error.	Minor	<ol style="list-style-type: none"> Start the server again to see if the problem remains. Update the server BIOS, BMC, and FRU/SDR firmware using the latest firmware update package. See “Firmware updates” on page 145 and “Updating (flash-updating) the BIOS code” on page 82 for more information. (Trained service technician only) Replace the system board, if necessary.
94C9	LPC component encountered a resource conflict error.	Major	<ol style="list-style-type: none"> Start the server again to see if the problem remains. Update the server BIOS, BMC, and FRU/SDR firmware using the latest firmware update package. See “Firmware updates” on page 145 and “Updating (flash-updating) the BIOS code” on page 82 for more information. (Trained service technician only) Replace the system board, if necessary.
9506	ATA/ATPI component encountered a controller error.	Minor	<ol style="list-style-type: none"> Make sure that the hard disk drive cable is connected correctly. Start the server again to see if the problem remains. (Trained service technician only) Replace the system board, if necessary.
95A6	PCI component encountered a controller error.	Minor	<ol style="list-style-type: none"> Start the server again to see if the problem remains. Update the server BIOS, BMC, and FRU/SDR firmware using the latest firmware update package. See “Firmware updates” on page 145 and “Updating (flash-updating) the BIOS code” on page 82 for more information. (Trained service technician only) Replace the system board, if necessary.

Table 5. POST error codes (continued)

<ul style="list-style-type: none"> • Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. • See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). • If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 			
Error code	Description	Response type	Action
95A7	PCI component encountered a read error.	Minor	<ol style="list-style-type: none"> 1. Start the server again to see if the problem remains. 2. Update the server BIOS, BMC, and FRU/SDR firmware using the latest firmware update package. See “Firmware updates” on page 145 and “Updating (flash-updating) the BIOS code” on page 82 for more information. 3. (Trained service technician only) Replace the system board, if necessary.
95A8	PCI component encountered a write error.	Minor	<ol style="list-style-type: none"> 1. Start the server again to see if the problem remains. 2. Update the server BIOS, BMC, and FRU/SDR firmware using the latest firmware update package. See “Firmware updates” on page 145 and “Updating (flash-updating) the BIOS code” on page 82 for more information. 3. (Trained service technician only) Replace the system board, if necessary.
9609	Unspecified software component encountered a start error.	Minor	<ol style="list-style-type: none"> 1. Restart the server to see if the error remains. 2. Update the server BIOS, BMC, and FRU/SDR firmware using the latest firmware update package. See “Firmware updates” on page 145 and “Updating (flash-updating) the BIOS code” on page 82 for more information.

Table 5. POST error codes (continued)

<ul style="list-style-type: none"> • Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. • See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). • If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 			
Error code	Description	Response type	Action
9641	PEI Core component encountered a load error.	Minor	<p>The Pre-EFI initialization core was enabled by BIOS.</p> <ol style="list-style-type: none"> 1. Restart the server to see if the error remains. 2. Update the server BIOS, BMC, and FRU/SDR firmware using the latest firmware update package. See “Firmware updates” on page 145 and “Updating (flash-updating) the BIOS code” on page 82 for more information. 3. (Trained service technician only) Replace the system board, if necessary.
9667	PEI module component encountered a illegal software state error.	Fatal	<ol style="list-style-type: none"> 1. Restart the server to see if the error remains. 2. Update the server BIOS, BMC, and FRU/SDR firmware using the latest firmware update package. See “Firmware updates” on page 145 and “Updating (flash-updating) the BIOS code” on page 82 for more information. 3. (Trained service technician only) Replace the system board, if necessary.
9687	DXE core component encountered a illegal software state error.	Fatal	<p>A Driver Execution Environment error was detected.</p> <ol style="list-style-type: none"> 1. Restart the server to see if the error remains. 2. Update the server BIOS, BMC, and FRU/SDR firmware using the latest firmware update package. See “Firmware updates” on page 145 and “Updating (flash-updating) the BIOS code” on page 82 for more information. 3. (Trained service technician only) Replace the system board, if necessary.

Table 5. POST error codes (continued)

<ul style="list-style-type: none"> • Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. • See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). • If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 			
Error code	Description	Response type	Action
96A7	DXE boot services driver component encountered a illegal software state error.	Fatal	<ol style="list-style-type: none"> 1. Restart the server to see if the error remains. 2. Update the server BIOS, BMC, and FRU/SDR firmware using the latest firmware update package. See “Firmware updates” on page 145 and “Updating (flash-updating) the BIOS code” on page 82 for more information. 3. (Trained service technician only) Replace the system board, if necessary.
96AB	DXE boot services driver component encountered invalid configuration.	Minor	<ol style="list-style-type: none"> 1. Restart the server to see if the error remains. 2. Update the server BIOS, BMC, and FRU/SDR firmware using the latest firmware update package. See “Firmware updates” on page 145 and “Updating (flash-updating) the BIOS code” on page 82 for more information. 3. (Trained service technician only) Replace the system board, if necessary.
96E7	SMM driver component encountered a illegal software state error.	Fatal	<p>A Server Management Mode error was detected.</p> <ol style="list-style-type: none"> 1. Restart the server to see if the error remains. 2. Update the server BIOS, BMC, and FRU/SDR firmware using the latest firmware update package. See “Firmware updates” on page 145 and “Updating (flash-updating) the BIOS code” on page 82 for more information. 3. (Trained service technician only) Replace the system board, if necessary.

Table 5. POST error codes (continued)

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Error code	Description	Response type	Action
0xA022	Processor component encountered a mismatch error.	Major	<ol style="list-style-type: none"> 1. Make sure that both of the microprocessors match (microprocessor number, cache sizes, front side bus, etc.). Both microprocessors must match for proper operation. 2. (Trained service technician only) Replace the microprocessor. 3. Start the server again to see if the problem remains.
0xA027	Processor component encountered a low voltage error.	Minor	<ol style="list-style-type: none"> 1. Start the server again to see if the problem remains. 2. (Trained service technician only) Replace the system board, if necessary. 3. Replace the power supply.
0xA028	Processor component encountered a high voltage error.	Minor	<ol style="list-style-type: none"> 1. Start the server again to see if the problem remains. 2. (Trained service technician only) Replace the system board, if necessary. 3. Replace the power supply.
0xA421	PCI component encountered a SERR error.	Fatal	<ol style="list-style-type: none"> 1. Make sure that the PCI Express adapter is correctly installed. 2. Make sure that the PCI Express adapter has the latest version of the device drivers and firmware installed. 3. Replace the PCI adapter. 4. (Trained service technician only) Replace the system board.
0xA500	ATA/ATPI ATA bus SMART not supported.	Minor	<p>SMART-capable ATA/ATAPI drives are required to enable the SMART reporting function.</p> <ol style="list-style-type: none"> 1. Install supported SMART-capable drives. See the Chapter 4, “Parts listing,” on page 87 for a list of supported drives for the server

Table 5. POST error codes (continued)

<ul style="list-style-type: none"> • Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. • See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). • If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 			
Error code	Description	Response type	Action
0xA501	ATA/ATPI ATA SMART is disabled	Minor	<p>SMART-capable ATA/ATAPI drives are required to enable the SMART reporting function.</p> <ol style="list-style-type: none"> 1. Install supported SMART-capable drives. See the Chapter 4, “Parts listing,” on page 87 for a list of supported drives for the server
0xA5A0	PCI Express component encountered a PERR error.	Minor	<ol style="list-style-type: none"> 1. Make sure that the PCI Express adapter is correctly installed. 2. Make sure that the PCI Express adapter has the latest version of the device drivers and firmware installed.
0xA5A1	PCI Express component encountered a SERR error.	Fatal	<ol style="list-style-type: none"> 1. Make sure that the PCI Express adapter is correctly installed. 2. Make sure that the PCI Express adapter has the latest version of the device drivers and firmware installed.
0xA5A4	PCI Express IBIST error.	Major	<ol style="list-style-type: none"> 1. Make sure that the PCI Express adapter is correctly installed. 2. Start the server again to see if the problem remains. 3. Replace the PCI Express adapter. 4. (Trained service technician only) Replace the system board, if necessary.
0xA6A0	DXE boot services driver Not enough memory available to shadow a legacy option ROM.	Minor	<ol style="list-style-type: none"> 1. Restart the server to see if the error remains. 2. Update the server BIOS, BMC, and FRU/SDR firmware using the latest firmware update package. See “Firmware updates” on page 145 and “Updating (flash-updating) the BIOS code” on page 82 for more information. 3. (Trained service technician only) Replace the system board, if necessary.

Error logs

The server generates two error logs:

- **POST error log**

This log contains the error codes and messages that were generated during POST.

- **BMC system event log**

This log contains errors and messages that were generated by the BMC controller.

You can view the contents of the POST error log and the BMC system event log from the BIOS Setup Utility program. The system error log and BMC system event log are limited in size. When these logs are full, new entries will not overwrite existing entries; therefore, you must periodically clear them through the BIOS Setup Utility program. When you are troubleshooting an error, be sure to clear both logs so that you can find current errors more easily.

Entries that are written to the system error log and BMC system event log during the early phase of POST show an incorrect date and time as the default time stamp; however, the date and time are corrected as POST continues.

Each system-event/error log entry is displayed on its own page. To move from one entry to the next, use the Up Arrow (↑) and Down Arrow (↓) keys.

Viewing error logs from the BIOS Setup Utility program

You can view the contents of the POST error log and the BMC system event error log from the BIOS Setup Utility program. For complete information about using the BIOS Setup Utility, see “Using the BIOS Setup Utility program” on page 141.

Viewing the POST error log: To view the POST error log, complete the following steps:

1. Turn on the server.
2. When the prompt Press F2 to enter Setup is displayed, press F2.
3. From the BIOS Setup main menu, select **Error Manager**.

Viewing the BMC system event log using the SELView Utility: The BMC system event log is accessible through the BIOS Setup Utility program using the extensible firmware interface (EFI) based System Event Log View (SELView) Utility. For additional information about the EFI Shell utilities, tools, and commands, see the documentation that is included in the downloadable files for the server at <http://www.ibm.com/systems/support/>.

You can use the SELView Utility to:

- View BMC system event log (SEL) data
- Save the system event log entries into a file
- Delete the current system event log entries
- View a system event log that you previously saved

The SELView Utility graphical user interface (GUI) screen consists of the three sections listed below. Use the <TAB> key to navigate between the three sections of the screen. Use the arrow keys to view options on the Menu bar.

- Menu bar (at the top of the screen)
- SEL event pane (in the middle of the screen)

- Event information pane (at the bottom of the screen)

To access the SELView Utility to view the system event log, complete the following steps:

1. Download the SELView Utility files from the IBM web site.
 - a. <http://www.ibm.com/systems/support/>.
 - b. Under **Product support**, click **System x**.
 - c. Under **Popular links**, click **Software and device drivers**.
 - d. Click **System x iDataPlex dx360 server** to display the matrix of downloadable files for the server.

Note: You can download the SELView Utility files to a USB flash drive or create a bootable CD.

2. After you download the files to the USB key device, type the command `ls` to view the contents of the USB key device.
3. Insert the USB key device into the USB port on the front of the server.
4. Start the server.
5. When the prompt `Press F2 to enter Setup` is displayed, press F2.
6. From the BIOS Setup main menu, select **Boot Manager**.
7. In the **Boot Manager** window, select **EFI Shell** and press Enter. The server boots to the EFI Shell.
8. Type the `map` command on the command line to view the device ID assigned to the USB key device.
9. At the EFI Shell prompt, type `fsn` (where *n* is the filesystem number for the USB key device).
10. Change the directory to the SELVIEW directory using the command: `cd selview`.
11. To start the SELView Utility, type the `selview` command at the command line.
12. Use the Tab key and tab to the SEL events pane.
13. Select a system event log entry using the arrow keys.
14. Tab to the event information pane and use the Up and Down arrow keys to read information in the system event log entry.

For more information on how to view the system event error log and to use the EFI commands, see the documentation that is included with the downloadable files.

Checkout procedure

The checkout procedure is the sequence of tasks that you should follow to diagnose a problem. The basic checkout procedure is designed for anyone to use. The advanced checkout procedure is intended for trained service technicians only.

About the checkout procedure

Before you perform the basic checkout procedure or the advanced checkout procedure for diagnosing hardware problems, review the following information:

- Read the safety information that begins on page vii.
- The diagnostic programs provide the primary methods of testing the major components. If you are not sure whether a problem is caused by the hardware or by the software, you can use the diagnostic programs to confirm that the hardware is working correctly.
- When you run the diagnostic programs, a single problem might cause more than one error message. When this happens, correct the cause of the first error message. The other error messages usually will not occur the next time you run the diagnostic programs.

Exception: If multiple error codes indicate a microprocessor error, the error might be in a microprocessor or in a microprocessor socket. See “Microprocessor problems” on page 60 for information about diagnosing microprocessor problems.

- Before you run the diagnostic programs, you must determine whether the failing system-board tray is part of a shared hard disk drive cluster (two or more system-board trays that share external storage devices). If it is part of a cluster, you can run all diagnostic programs except the ones that test the storage unit (that is, a hard disk drive in the storage unit) or the storage adapter that is attached to the storage unit. The failing system-board tray might be part of a cluster if any of the following conditions is true:
 - You have identified the failing system-board tray as part of a cluster (two or more system-board trays that share external storage devices).
 - One or more external storage units are attached to the failing system-board tray and at least one of the attached storage units is also attached to another server or unidentifiable device.

Important: If the system-board tray is part of a shared hard disk drive cluster, run one test at a time. Do not run any suite of tests, such as “quick” or “normal” tests, because this might enable the hard disk drive diagnostic tests.

- If the system-board tray is halted and a POST error code is displayed, see “POST error codes” on page 18. If the system-board tray is halted and no error message is displayed, see “Troubleshooting tables” on page 57 and “Solving undetermined problems” on page 85.
- For information about power-supply problems, see “Power problems” on page 61.
- For intermittent problems, check the error log; see “Error logs” on page 52 and “Diagnostic programs, messages, and error codes” on page 63.

Performing the basic checkout procedure

To perform the checkout procedure, complete the following steps:

1. Is the system-board tray part of a cluster?
 - **No:** Go to step 2.
 - **Yes:** Shut down all failing system-board trays that are related to the cluster. Go to step 2.
2. Complete the following steps:
 - a. If the system-board tray is running, turn off the system-board tray.
 - b. Check all installed devices for compatibility.
 - c. Turn on the system-board tray. If the system-board tray does not start, see “Troubleshooting tables” on page 57.
 - d. Record any POST beep codes that sound or POST error messages that are displayed on the monitor. If an error is displayed, look up the first error in “POST error codes” on page 18.
 - e. Check the system-error LED on the system-board tray operator panel. If it is lit, check the BMC system-event log.

Important: If the system-error LED on the front of the system-board tray is lit but there are no error indications, clear the BMC system-event log. This log does not clear itself, and if it begins to fill up, the system-error LED will be lit. Also, after you complete a repair or correct an error, clear the BMC system-event log to turn off the system-error LED.

- f. Check for the following results:
 - Successful completion of POST, indicated by a single beep
 - Successful completion of startup, indicated by a readable display of the operating-system desktop
3. Did a single beep sound and are there readable instructions on the main menu?
 - **No:** Find the failure symptom in “Troubleshooting tables” on page 57; if necessary, see “Solving undetermined problems” on page 85.
 - **Yes:** Run the diagnostic programs (see “Running the diagnostic programs” on page 64).
 - If you receive an error, see “Diagnostic error codes” on page 66.
 - If the diagnostic programs were completed successfully and you still suspect a problem, see “Solving undetermined problems” on page 85.

Important: Clear the error manager and the BMC system-event log after you correct all conditions. This will turn off the system-error LED, if all conditions are corrected.

Performing the advanced checkout procedure

This section contains information for trained service technicians.

The no POST no video environment occurs when the server does not complete POST and there is no output to the monitor during startup. To perform the no POST no video troubleshooting procedure, complete the following steps:

1. Search the Retain tips for a known solution that will correct the problem. Did a Retain tip correct the issue?
 - **Yes:** The problem is solved.
 - **No:** Go to step 2 on page 56.

2. Verify that the power supply is receiving power. Is the power properly turned on and are the power-supply fans working?
 - **Yes:** Go to step 3.
 - **No:** Go to step 4.
3. Remove the system-board tray from the chassis and apply power to the chassis. Is the fan on the power supply working?
 - **Yes:** (Trained service technician only) Replace the system-board tray.
 - **No:** Replace the power supply.
4. Check to see if power is being applied to the system-board tray. Reinstall the system-board tray in the chassis and press the power-control button to turn on the system. Are the chassis fans working?
 - **Yes:** Go to step 6.
 - **No:** Complete the following steps:
 - a. Remove the chassis from the rack.
 - b. Remove the chassis top cover.
 - c. Reseat the fan packs on the power supply.
 - d. Go to step 5.
5. With the system-board tray installed in the chassis and the chassis top cover removed, apply power to the system. Is the amber LED on the power supply lit?
 - **Yes:** Replace the power supply.
 - **No:** (Trained service technician only) If the amber LED on the power supply is not lit, replace the system-board tray.
6. Reseat all of the system board components, including the following:
 - Cables
 - DIMMs
 - Optional adapters
 - Video card

Go to step 7.
7. Turn on the system. Does the system start and display output to the monitor?
 - **Yes:** One of the components was loose. The problem is fixed.
 - **No:** Go to step 8.
8. Configure the system to the minimum hardware requirements as listed in “Solving undetermined problems” on page 85; then, turn on the system. Does the system start and display output to the monitor?
 - **Yes:** The problem was caused by one or more of the components that were removed. Reinstall each device one at a time to isolate the failing component; then, replace the component.
 - **No:** Go to step 9.
9. Verify that the BIOS code is running at startup.
 - a. Remove all DIMMs from the system.
 - b. Turn on the system. Did a memory-error beep code occur?
 - **Yes:** Go to step 10.
 - **No:** (Trained service technician only) Replace the system-board tray.
10. Test POST again by completing the following steps:
 - a. Reinstall the DIMMs.

- b. Clear CMOS by using the procedure listed in “Clearing CMOS memory” on page 81.
 - c. Turn on the system.
 - d. Does the system start and display output to the monitor?
 - **Yes:** Go to step 11.
 - **No:** See the “Solving undetermined problems” on page 85 to continue troubleshooting.
11. Recover the system BIOS.
- a. Use the BIOS recovery procedure listed in “Recovering from a BIOS update failure” on page 83.
 - b. Turn on the system.
 - c. Does the system start and display output to the monitor?
 - **Yes:** The symptom has changed, see “Solving undetermined problems” on page 85 to continue troubleshooting.
 - **No:** Go to step 12.
12. (Trained service technician only) Replace the system-board tray.

Troubleshooting tables

Use the troubleshooting tables to find solutions to problems that have identifiable symptoms.

If you cannot find a problem in these tables, see “Running the diagnostic programs” on page 64 for information about testing the system-board tray.

If you have just added new software or a new optional device and the system-board tray is not working, complete the following steps before you use the troubleshooting tables:

1. Remove the software or device that you just added.
2. Run the diagnostic tests to determine whether the system-board tray is running correctly.
3. Reinstall the new software or new device.

General problems

<ul style="list-style-type: none"> • Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. • See Chapter 4, “Parts listing,” on page 87 to determine which components are CRUs and which components are FRUs. • If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 	
Symptom	Action
A cover lock is broken, an LED is not working, or a similar problem has occurred.	If the part is a CRU, replace it. If the part is a FRU, the part must be replaced by a trained service technician.

Hard disk drive problems

<ul style="list-style-type: none"> • Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. • See Chapter 4, “Parts listing,” on page 87 to determine which components are CRUs and which components are FRUs. • If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 	
Symptom	Action
Not all drives are recognized by the hard disk drive diagnostic test.	Remove the drive that is indicated by the diagnostic tests; then, run the hard disk drive diagnostic test again. If the remaining drives are recognized, replace the drive that you removed with a new one.
The system-board tray stops responding during the hard disk drive diagnostic test.	Remove the hard disk drive that was being tested when the system-board tray stopped responding, and run the diagnostic test again. If the hard disk drive diagnostic test runs successfully, replace the drive that you removed with a new one.
A hard disk drive was not detected while the operating system was being started.	Reseat all hard disk drives and cables; then, run the hard disk drive diagnostic tests again.
A hard disk drive passes the hard disk drive diagnostic test, but the problem remains.	Run the hard disk drive diagnostic test again. If the drive continues to pass the test but continues to have a problem, replace the drive with a new one.

Intermittent problems

<ul style="list-style-type: none"> • Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. • See Chapter 4, “Parts listing,” on page 87 to determine which components are CRUs and which components are FRUs. • If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 	
Symptom	Action
A problem occurs only occasionally and is difficult to diagnose.	<ol style="list-style-type: none"> 1. Make sure that: <ul style="list-style-type: none"> • All cables are connected securely to the front of the system-board tray and the power cord is connected securely to the rear of the chassis. • When the system-board tray is turned on, air is flowing from the rear of the chassis. If there is no airflow, the fan assembly is not working. This causes the system-board tray to overheat and shut down. 2. Check the error manager and the BMC system-event log (see “Error logs” on page 52). 3. See “Solving undetermined problems” on page 85.

Keyboard or mouse problems

<ul style="list-style-type: none"> • Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. • See Chapter 4, “Parts listing,” on page 87 to determine which components are CRUs and which components are FRUs. • If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 	
Symptom	Action
All keyboard and mouse problems.	<ol style="list-style-type: none"> 1. Make sure that: <ul style="list-style-type: none"> • The keyboard and mouse cables are compatible with the system-board tray. • The keyboard and mouse cables are securely connected. • The keyboard and mouse device drivers are installed correctly. 2. If you are using a USB keyboard and mouse and they are connected to a USB hub, disconnect the devices from the hub and connect them directly to the system-board tray. 3. Replace the following components one at a time, in the order shown, restarting the system-board tray each time: <ol style="list-style-type: none"> a. Keyboard or mouse b. (Trained service technician only) System-board tray

Memory problems

<ul style="list-style-type: none"> • Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. • See Chapter 4, “Parts listing,” on page 87 to determine which components are CRUs and which components are FRUs. • If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 	
Symptom	Action
The amount of system memory that is displayed is less than the amount of installed physical memory.	<ol style="list-style-type: none"> 1. Make sure that: <ul style="list-style-type: none"> • The memory modules are seated correctly. • You have installed the correct type of memory. • All branches and channels of memory are detected on startup. Use the BIOS Setup Utility to view installed DIMM information. 2. Check the error manager and system event log for DIMM error messages: <ul style="list-style-type: none"> • Reseat the DIMMs and restart the system-board tray. • If the DIMM error occurs again, replace the DIMMs and restart the system-board tray. 3. Run memory diagnostics (see “Running the diagnostic programs” on page 64). 4. Make sure that there is no memory mismatch when the system-board tray is at the minimum memory configuration (see “Solving undetermined problems” on page 85 for information about the minimum required configuration). 5. Add one pair of DIMMs at a time, making sure that the DIMMs in each pair match. 6. Replace the following components one at a time, in the order shown, restarting the system-board tray each time: <ol style="list-style-type: none"> a. DIMMs b. (Trained service technician only) System-board tray

Microprocessor problems

<ul style="list-style-type: none"> • Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. • See Chapter 4, “Parts listing,” on page 87 to determine which components are CRUs and which components are FRUs. • If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 	
Symptom	Action
Multiple error codes indicate a microprocessor error.	<ol style="list-style-type: none"> 1. (Trained service technician only) Reseat the microprocessor and restart the system-board tray. 2. Run the Dynamic System Analysis (DSA) Preboot diagnostic programs. See “Running the diagnostic programs” on page 64. 3. (Trained service technician only) If the problem remains, replace the microprocessor.

Optional-device problems

<ul style="list-style-type: none"> • Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. • See Chapter 4, “Parts listing,” on page 87 to determine which components are CRUs and which components are FRUs. • If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 	
Symptom	Action
An IBM optional device that was just installed does not work.	<ol style="list-style-type: none"> 1. Make sure that: <ul style="list-style-type: none"> • The device is designed for the system-board tray. • You followed the installation instructions that came with the device and the device is installed correctly. • You have not loosened any other installed devices or cables. • You updated the configuration information in the BIOS Setup Utility program. Whenever memory or any other device is changed, you must update the configuration. 2. If the device comes with its own test instructions, use those instructions to test the device. 3. Reseat the device that you just installed. 4. Replace the device that you just installed.
An IBM optional device that used to work does not work now.	<ol style="list-style-type: none"> 1. Make sure that all of the cable connections for the device are secure. 2. If the device comes with test instructions, use those instructions to test the device. 3. Reseat the failing device. 4. Replace the failing device.

Power problems

<ul style="list-style-type: none"> Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 	
Symptom	Action
The power-control button does not work (the system-board tray does not start).	<ol style="list-style-type: none"> Make sure that the operator panel power-control button is working correctly: <ol style="list-style-type: none"> Disconnect the chassis power cord. Reconnect the power cord. Press the power-control button. Make sure that: <ul style="list-style-type: none"> The power cord is correctly connected to the chassis and to a working electrical outlet and the power supply fan is working. The system-board tray contains the correct type of DIMMs. The DIMMs are correctly seated. The microprocessor is correctly installed. Reseat the following components: <ol style="list-style-type: none"> DIMMs Power-supply cables to all internal components Power supply Replace the following components one at a time, in the order shown, restarting the system-board tray each time: <ol style="list-style-type: none"> DIMMs Power supply If you just installed an optional device, remove it, and restart the system-board tray. If the system-board tray now starts, you might have installed more devices than the power supply supports. See “Solving undetermined problems” on page 85.
The system-board tray does not turn off.	<ol style="list-style-type: none"> Determine whether you are using an Advanced Configuration and Power Interface (ACPI) or a non-ACPI operating system. If you are using a non-ACPI operating system, complete the following steps: <ol style="list-style-type: none"> Press Ctrl+Alt+Delete. Turn off the system-board tray by holding the power-control button for 5 seconds. Restart the system-board tray. If the system-board tray fails POST and the power-control button does not work, disconnect the ac power cord for 20 seconds; then, reconnect the ac power cord and restart the system-board tray. (Trained service technician only) If the problem remains or if you are using an ACPI-aware operating system, suspect the system board.
The system-board tray unexpectedly shuts down, and the LEDs on the operator panel are not lit.	See “Solving undetermined problems” on page 85.

Serial-device problems

<ul style="list-style-type: none"> • Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. • See Chapter 4, “Parts listing,” on page 87 to determine which components are CRUs and which components are FRUs. • If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 	
Symptom	Action
The number of serial ports that are identified by the operating system is less than the number of installed serial ports.	<ol style="list-style-type: none"> 1. Make sure that each port is assigned a unique address in the BIOS Setup Utility program and no serial ports are disabled. 2. Reseat the serial port adapter, if one is installed. 3. Replace the serial port adapter, if one is installed.
A serial device does not work.	<ol style="list-style-type: none"> 1. Make sure that: <ul style="list-style-type: none"> • The device is compatible with the system-board tray. • The serial port is enabled and is assigned a unique address. • The device is connected to the correct connector (see “Operator panel controls, LEDs, and connectors” on page 8). 2. Reseat the following components: <ol style="list-style-type: none"> a. Failing serial device b. Serial cable 3. Replace the following components one at a time, in the order shown, restarting the system-board tray each time: <ol style="list-style-type: none"> a. Failing serial device b. Serial cable c. (Trained service technician only) System-board tray

Software problems

<ul style="list-style-type: none"> • Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. • See Chapter 4, “Parts listing,” on page 87 to determine which components are CRUs and which components are FRUs. • If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 	
Symptom	Action
You suspect a software problem.	<ol style="list-style-type: none"> 1. To determine whether the problem is caused by the software, make sure that: <ul style="list-style-type: none"> • The system-board tray has the minimum memory that is needed to use the software. For memory requirements, see the information that comes with the software. Note: If you have just installed an adapter or memory, the system-board tray might have a memory-address conflict. • The software is designed to operate on the system-board tray. • Other software works on the system-board tray. • The software works on another system-board tray. 2. If you receive any error messages while you use the software, see the information that comes with the software for a description of the messages and suggested solutions to the problem. 3. Contact your place of purchase of the software.

Universal Serial Bus (USB) port problems

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 4, “Parts listing,” on page 87 to determine which components are CRUs and which components are FRUs.
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Symptom	Action
A USB device does not work.	<ol style="list-style-type: none">1. Run USB diagnostics (see “Running the diagnostic programs” on page 64).2. Make sure that:<ul style="list-style-type: none">• The operating system supports USB devices.• The correct USB device driver is installed.3. Make sure that the USB controller is enabled and USB configuration options are set correctly in the BIOS Setup Utility program.4. If you are using a USB hub, disconnect the USB device from the hub and connect it directly to the system-board tray.5. (Trained service technician only) Replace the system-board tray.

Diagnostic programs, messages, and error codes

The IBM Dynamic System Analysis (DSA) Preboot diagnostic programs are the primary method of testing the major components of the system-board tray. DSA is a system information collection and analysis tool that you can use to provide information to IBM service and support to aid in the diagnosis of the system problems. You can download DSA from <http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA>.

Note: You can select to download images of the DSA programs for external USB storage devices, such as a USB memory key or an external USB CD ROM drive.

As you run the diagnostic programs, text messages are displayed on the screen and are saved in the test log. A diagnostic text message indicates that a problem has been detected and indicates what action you should take as a result of the text message.

The DSA diagnostic programs collect information about the following aspects of the system:

- System configuration
- Network interfaces and settings
- Hardware inventory, including PCIe and USB information
- Service processor status and configuration
- Vital product data, firmware, and basic input/output system (BIOS)
- Drive health information
- LSI RAID and adapter configuration
- Event logs for RAID adapters and service processors

The DSA diagnostic programs also can provide diagnostics for the following system components, if they are installed in the system:

- Gigabit Ethernet controller

- Hard disk drives
- PCIe adapters
- Baseboard management controller
- Memory
- Microprocessor

Note: The memory stress test is the only memory test supported on the dx360 server, and it does not provide any DIMM isolation capabilities.

The diagnostic programs create a merged log called the DSA error log, which includes events from all collected logs. You can output all of the collected information as a compressed XML file that you can send to IBM service and support, view the information locally through a generated text report file, or copy the log to a removable media and view the log from a Web browser. See “Running the diagnostic programs” for more information.

Make sure that you have the latest version of the DSA diagnostic programs. The DSA Portable Edition is available for external USB storage devices such as a USB memory key or an external USB CD ROM drive. To download the latest version of DSA, complete the following steps.

Note: Changes are made periodically to the IBM Web site. The actual procedure might vary slightly from what is described in this document.

1. Go to <http://www.ibm.com/systems/support/>.
2. Under **Product support**, click **System x**.
3. Under **Popular links**, click **Software and device drivers**.
4. Click **Dynamic System Analysis (DSA)**.

For additional information about tools for updating, managing, and deploying firmware, see the System x and xSeries Tools Center at <http://publib.boulder.ibm.com/infocenter/toolsctr/v1r0/index.jsp>.

Running the diagnostic programs

Important: The DSA diagnostic programs do not support USB CD-ROM drives. If you run the DSA diagnostic programs while any USB CD-ROM drives are attached, ignore any optical drive test results that are returned for USB CD-ROM drives. You also can remove USB CD-ROM drives before you run the DSA diagnostic programs to get accurate optical drive test results.

To run the DSA Preboot diagnostic programs, complete the following steps:

1. If the system-board tray is running, turn off the system-board tray and all attached devices.
2. Connect a USB CD or DVD drive, or the USB memory key containing the DSA Preboot diagnostic programs, to a USB connector on the front of the system-board tray.

Note: To run the DSA Preboot diagnostic programs, you might need an external USB CD-RW/DVD drive such as the IBM and Lenovo part number 73P4515 or 73P4516.

3. If you are using a USB CD or DVD drive, insert the *IBM Dynamic System Analysis Preboot Diagnostic* CD into the CD or DVD drive.
4. Turn on all attached devices; then, turn on the system-board tray.

5. When the prompt Press F2 to enter setup is displayed, press F2.
6. From the BIOS Setup Utility menu, select **Boot Manager**.
7. From the **Boot Manager** menu, select the device containing the DSA Preboot diagnostic programs as the startup device.
8. Press Enter and follow the prompts. The diagnostic programs start.
9. From the diagnostic programs screen, select the test that you want to run, and follow the instructions on the screen.

Follow the actions in the “Diagnostic error codes” on page 66 to solve the problem.

If the diagnostic programs do not detect any hardware errors but the problem remains during normal operations, a software error might be the cause. If you suspect a software problem, see the information that comes with your software.

A single problem might cause more than one error message. When this happens, correct the cause of the first error message. The other error messages usually will not occur the next time you run the diagnostic programs.

Exception: If multiple error codes indicate a microprocessor error, the error might be in a microprocessor or in a microprocessor socket. See “Microprocessor problems” on page 60 for information about diagnosing microprocessor problems.

If the system-board tray stops during testing and you cannot continue, restart the system-board tray and try running the diagnostic programs again. If the problem remains, replace the component that was being tested when the system-board tray stopped.

Diagnostic text messages

Diagnostic text messages are displayed while the tests are running. A diagnostic text message contains one of the following results:

Passed: The test was completed without any errors.

Failed: The test detected an error.

Aborted: The test could not proceed because of the server configuration.

Viewing the test log

You can use one of the following methods to access the test log when the tests are completed:

- From the DSA command line, issue the DSA CLI **view** command or select **Diagnostic Event Log** from the DSA graphical user interface (GUI).
- From the DSA interactive menu, select **getextendedresults**.
- From the DSA interactive menu, select **view** to view all of the collected results and error log data.
- In the DSA GUI, select **DSA Error Log** from the System Information page.

You can send the DSA error log file to IBM service and support to aid in diagnosing the server problems or you can use the DSA CLI **copy** command to copy the log to an external USB device.

Diagnostic error codes

The following table describes the messages that the diagnostic programs might generate and suggested actions to correct the detected problems. Follow the suggested actions in the order in which they are listed in the action column.

Important: The DSA diagnostic programs do not support USB CD-ROM drives. If you run the DSA diagnostic programs while any USB CD-ROM drives are attached, ignore any optical drive test results that are returned for USB CD-ROM drives.

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Message number	Component	Test	State	Description	Action
089-801-xxx	CPU	CPU Stress Test	Aborted	Internal program error.	<ol style="list-style-type: none"> 1. Turn off and restart the system-board tray. 2. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. 3. Run the test again. 4. Make sure that the firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. 5. Run the test again. 6. If the system-board tray has stopped responding, turn it off and restart it. 7. Run the test again. 8. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL.

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Message number	Component	Test	State	Description	Action
089-802-xxx	CPU	CPU Stress Test	Aborted	System resource availability error.	<ol style="list-style-type: none"> 1. Turn off and restart the system-board tray. 2. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. 3. Run the test again. 4. Make sure that the firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. 5. Run the test again. 6. If the system has stopped responding, turn off and restart the system-board tray. 7. Run the test again. 8. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL.

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Message number	Component	Test	State	Description	Action
089-803-xxx	CPU	CPU Stress Test	Aborted	Memory size insufficient to run the test. At least 1 GB is required.	<ol style="list-style-type: none"> 1. Turn off and restart the system-board tray. 2. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. 3. Run the test again. 4. Make sure that the firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. 5. Run the test again. 6. If the system-board tray has stopped responding, turn off and restart the system-board tray. 7. Run the test again. 8. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL.
201-801-xxx	Memory	Memory Test	Aborted	Test canceled: the system BIOS programmed the memory controller with an invalid CBAR address.	<ol style="list-style-type: none"> 1. Turn off and restart the system-board tray. 2. Run the test again. 3. Make sure that the BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. 4. Run the test again. 5. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL.

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Message number	Component	Test	State	Description	Action
201-802-xxx	Memory	Memory Test	Aborted	Test canceled: the end address in the E820 function is less than 16 MB.	<ol style="list-style-type: none"> 1. Turn off and restart the system-board tray. 2. Run the test again. 3. Make sure that all DIMMs are enabled in the BIOS Setup Utility program (press F2 at system startup). 4. Make sure that the BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. 5. Run the test again. 6. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL.
201-803-xxx	Memory	Memory Test	Aborted	Test canceled: could not enable the microprocessor cache.	<ol style="list-style-type: none"> 1. Turn off and restart the system-board tray. 2. Run the test again. 3. Make sure that the BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. 4. Run the test again. 5. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL.

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Message number	Component	Test	State	Description	Action
201-804-xxx	Memory	Memory Test	Aborted	Test canceled: the memory controller buffer request failed.	<ol style="list-style-type: none"> 1. Turn off and restart the system-board tray. 2. Run the test again. 3. Make sure that the BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. 4. Run the test again. 5. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL.
201-805-xxx	Memory	Memory Test	Aborted	Test canceled: the memory controller display/alter write operation was not completed.	<ol style="list-style-type: none"> 1. Turn off and restart the system-board tray. 2. Run the test again. 3. Make sure that the BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. 4. Run the test again. 5. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL.

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Message number	Component	Test	State	Description	Action
201-806-xxx	Memory	Memory Test	Aborted	Test canceled: the memory controller fast scrub operation was not completed.	<ol style="list-style-type: none"> 1. Turn off and restart the system-board tray. 2. Run the test again. 3. Make sure that the BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. 4. Run the test again. 5. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL.
201-807-xxx	Memory	Memory Test	Aborted	Test canceled: the memory controller buffer free request failed.	<ol style="list-style-type: none"> 1. Turn off and restart the system-board tray. 2. Run the test again. 3. Make sure that the BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. 4. Run the test again. 5. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL.

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Message number	Component	Test	State	Description	Action
201-808-xxx	Memory	Memory Test	Aborted	Test canceled: memory controller display/alter buffer execute error.	<ol style="list-style-type: none"> 1. Turn off and restart the system-board tray. 2. Run the test again. 3. Make sure that the BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. 4. Run the test again. 5. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL.
201-809-xxx	Memory	Memory Test	Aborted	Test canceled program error: operation running fast scrub.	<ol style="list-style-type: none"> 1. Turn off and restart the system-board tray. 2. Run the test again. 3. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. 4. Make sure that the BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. 5. Run the test again. 6. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL.

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Message number	Component	Test	State	Description	Action
201-810-xxx	Memory	Memory Test	Aborted	Test canceled: unknown error code xxx received in COMMONEXIT procedure.	<ol style="list-style-type: none"> 1. Turn off and restart the system-board tray. 2. Run the test again. 3. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. 4. Make sure that the BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. 5. Run the test again. 6. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL.

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Message number	Component	Test	State	Description	Action
201-901-xxx	Memory	Memory Test	Failed	Test failure: single-bit error, failing bank x, failing DIMM z.	<ol style="list-style-type: none"> 1. Turn off the system-board tray and disconnect the chassis from the power source. 2. Reseat DIMM z. 3. Reconnect the chassis to the power source and turn on the system-board tray. 4. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. 5. Make sure that the BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. 6. Run the test again. 7. Replace the failing DIMMs. 8. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL.

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Message number	Component	Test	State	Description	Action
202-801-xxx	Memory	Memory Stress Test	Aborted	Internal program error.	<ol style="list-style-type: none"> 1. Turn off and restart the system-board tray. 2. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. 3. Make sure that the BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. 4. Run the test again. 5. Turn off and restart the system-board tray if necessary to recover from a hung state. 6. Run the memory diagnostics to identify the specific failing DIMM. 7. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL.

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Message number	Component	Test	State	Description	Action
202-802-xxx	Memory	Memory Stress Test	Aborted	Memory size is insufficient to run the test. At least 1 GB is required.	<ol style="list-style-type: none"> 1. Turn off and restart the system-board tray. 2. Make sure that all memory is enabled by checking the Memory Configuration under the Advanced option in the BIOS Setup Utility program (press F2 at system startup). 3. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. 4. Make sure that the BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. 5. Run the test again. 6. Turn off and restart the system-board tray if necessary to recover from a hung state. 7. Run the memory diagnostics to identify the specific failing DIMM. 8. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL.

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Message number	Component	Test	State	Description	Action
202-901-xxx	Memory	Memory Stress Test	Failed	Test failure.	<ol style="list-style-type: none"> 1. Run the standard DSA memory diagnostic to validate all memory. 2. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. 3. Turn off the system-board tray and disconnect the chassis from power. 4. Reseat the DIMMs. 5. Reconnect the system to power and turn on the system. 6. Run the test again. 7. Run the standard DSA memory diagnostic to validate all memory. 8. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL.
405-901-xxx	Ethernet device	TestControlRegisters	Failed		<ol style="list-style-type: none"> 1. Make sure that the component firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. 2. Run the test again. 3. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL.

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Message number	Component	Test	State	Description	Action
405-902-xxx	Ethernet device	TestMIIRegisters	Failed		<ol style="list-style-type: none"> 1. Make sure that the component firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. 2. Run the test again. 3. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL.
405-903-xxx	Ethernet device	TestEEPROM	Failed		<ol style="list-style-type: none"> 1. Make sure that the component firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. 2. Run the test again. 3. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL.
405-904-xxx	Ethernet device	TestInternalMemory	Failed		<ol style="list-style-type: none"> 1. Make sure that the component firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. 2. Run the test again. 3. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL.

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Message number	Component	Test	State	Description	Action
405-905-xxx	Ethernet device	TestInterrupt	Failed		<ol style="list-style-type: none"> 1. Make sure that the component firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. 2. Run the test again. 3. Check the interrupt assignments in the PCI Hardware section of the DSA event log. If the Ethernet device is sharing interrupts, if possible, use the BIOS Setup Utility program (press F1 at system startup) to assign a unique interrupt to the device. 4. Run the test again. 5. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL.
405-906-xxx	Ethernet device	TestLoopbackAtMAC-Layer	Failed		<ol style="list-style-type: none"> 1. Make sure that the component firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. 2. Run the test again. 3. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL.

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 4, “Parts listing,” on page 87 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Message number	Component	Test	State	Description	Action
405-907-xxx	Ethernet device	TestLoopbackAtPhysicalLayer	Failed		<ol style="list-style-type: none"> 1. Check the Ethernet cable for damage and make sure that the cable type and connection are correct. 2. Make sure that the component firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. 3. Run the test again. 4. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL.
405-908-xxx	Ethernet device	TestLEDs	Failed		<ol style="list-style-type: none"> 1. Make sure that the component firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. 2. Run the test again. 3. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL.

Clearing CMOS memory

Change the position of the CMOS Clear jumper on the system board to clear CMOS memory.

Note: Changing the position of this jumper does not affect user or administrator passwords. If the passwords are set and forgotten, see “Clearing passwords” for more information.

To clear the CMOS data, complete the following steps:

1. Read the safety information that begins on page vii and “Installation guidelines” on page 95.
2. If the system-board tray is installed in a chassis, remove it (see “Removing the system-board tray from a 2U chassis” on page 97).
3. If a storage enclosure is installed, remove it (see “Removing a storage enclosure from a system-board tray” on page 99); otherwise, remove the system-board tray cover (see “Removing the system-board tray cover” on page 101).
4. Locate the CMOS Clear jumper (see “System-board jumpers” on page 13).
5. Move the jumper from pins 1 and 2 to pins 2 and 3; then, move the jumper back to pins 1 and 2.
6. Install the storage enclosure, if you removed one to clear the CMOS memory (see “Installing a storage enclosure on a system-board tray” on page 100); otherwise, install the system-board tray cover (see “Installing the system-board tray cover” on page 102).
7. Install the system-board tray in the chassis (see “Installing the system-board tray in a 2U chassis” on page 98).
8. Turn on the server and run the BIOS Setup Utility program. Set configuration parameters as necessary (see “Using the BIOS Setup Utility program” on page 141 for information).

Clearing passwords

If user or administrator passwords are set and forgotten, change the position of the Password Clear jumper on the system board to clear the passwords.

To clear user and administrator passwords, complete the following steps:

1. Read the safety information that begins on page vii and “Installation guidelines” on page 95
2. If the system-board tray is installed in a chassis, remove it (see “Removing the system-board tray from a 2U chassis” on page 97).
3. If a storage enclosure is installed, remove it (see “Removing a storage enclosure from a system-board tray” on page 99); otherwise, remove the system-board tray cover (see “Removing the system-board tray cover” on page 101).
4. Locate the Password Clear jumper (see “System-board jumpers” on page 13).
5. Move the jumper from pins 1 and 2 to pins 2 and 3; then, move the jumper back to pins 1 and 2.
6. Install the storage enclosure, if you removed one to clear the passwords (see “Installing a storage enclosure on a system-board tray” on page 100); otherwise, install the system-board tray cover (see “Installing the system-board tray cover” on page 102).

7. Install the system-board tray in the chassis (see “Installing the system-board tray in a 2U chassis” on page 98).
8. Turn on the server and run the BIOS Setup Utility program. Set configuration parameters as necessary (see “Using the BIOS Setup Utility program” on page 141 for information).

Updating (flash-updating) the BIOS code

Periodically, IBM makes new levels of BIOS code available on the Web. Always check <http://www.ibm.com/systems/support/> for the latest level of BIOS code, device drivers, documentation, and hints and tips. You can use one of the following methods to update (flash-update) the BIOS code on the system-board tray:

- Download the BIOS code update file directly to the hard disk drive.
- Download the BIOS code update file to a CD or DVD (you must attach an optional external USB portable CD or DVD drive to the system-board tray); then, start the system-board tray with the CD or DVD in the CD or DVD drive to update the BIOS code.

One file type is available for each of these methods. The description next to each file indicates the type of medium to which you can download the file. A readme file is also available with instructions for installing the BIOS code update.

To download the BIOS (flash) update files, complete the following steps.

Note: Changes are made periodically to the IBM Web site. The actual procedure might vary slightly from what is described in this document.

1. Go to <http://www.ibm.com/systems/support/>.
2. Under **Product support**, click **System x**.
3. Under **Popular links**, click **Software and device drivers**.
4. Click **System x iDataPlex dx360 server** to display the matrix of downloadable files.
5. Select the applicable file for your operating system and the file type for the medium that you want to use; then, download the flash BIOS update.
6. Update the BIOS code. Follow the instructions in the readme file that comes with the update file that you downloaded.

Note: Always reset the BIOS Setup Utility program to the default values after you update the BIOS code.

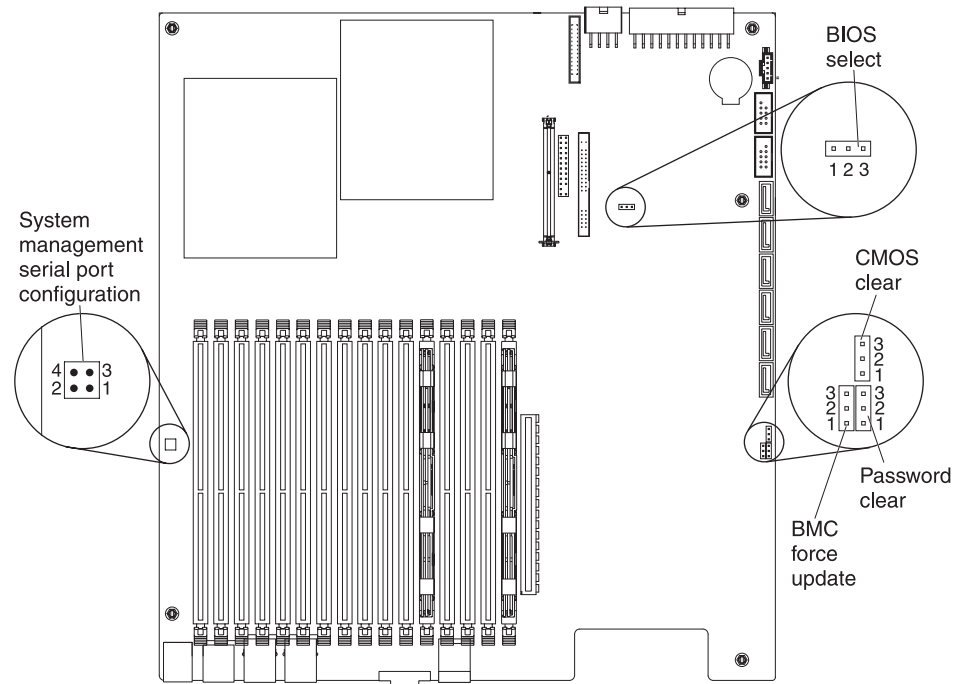
7. Restart the system-board tray.

Recovering from a BIOS update failure

If power to the system-board tray is interrupted while the BIOS code is being updated, the system-board tray might not restart correctly or might not display video. If this happens, use the procedure in this section to recover the BIOS code. You also can use this procedure to recover from a BIOS ROM corruption or checksum failure.

To recover the BIOS code, complete the following steps:

1. Read the safety information that begins on page vii and “Installation guidelines” on page 95.
2. Turn off the system-board tray and all attached devices; then, disconnect all external cables.
3. If the system-board tray is installed in a chassis, remove it (see “Removing the system-board tray from a 2U chassis” on page 97).
4. If a storage enclosure is installed, remove it (see “Removing a storage enclosure from a system-board tray” on page 99); otherwise, remove the system-board tray cover (see “Removing the system-board tray cover” on page 101).
5. Locate the BIOS Select jumper on the system board (see the following illustration).



6. Move the BIOS Select jumper to pins 1 and 2.
7. Install the storage enclosure, if you removed one to move the BIOS Select jumper (see “Installing a storage enclosure on a system-board tray” on page 100); otherwise, install the system-board tray cover (see “Installing the system-board tray cover” on page 102).
8. Install the system-board tray in the chassis (see “Installing the system-board tray in a 2U chassis” on page 98).
9. Reconnect all external cables.
10. Insert the update CD or DVD into the CD or DVD drive.
11. Turn on the system-board tray and the monitor.

After the update session is completed, remove the CD or DVD from the drive and turn off the system-board tray.

12. Disconnect all power cords and external cables.
13. Remove the system-board tray from the chassis (see “Removing the system-board tray from a 2U chassis” on page 97).
14. If a storage enclosure is installed, remove it (see “Removing a storage enclosure from a system-board tray” on page 99); otherwise, remove the system-board tray cover (see “Removing the system-board tray cover” on page 101).
15. Return the BIOS Select jumper to pins 2 and 3.
16. Install the storage enclosure, if you removed one to move the BIOS Select jumper (see “Installing a storage enclosure on a system-board tray” on page 100); otherwise, install the system-board tray cover (see “Installing the system-board tray cover” on page 102).
17. Install the system-board tray in the chassis (see “Installing the system-board tray in a 2U chassis” on page 98).
18. Reconnect the external cables and power cords; then, turn on the attached devices and turn on the system-board tray.
19. Update the BIOS code on the system-board tray (see “Updating (flash-updating) the BIOS code” on page 82).

Solving Ethernet controller problems

The method that you use to test the Ethernet controller depends on which operating system you are using. See the operating-system documentation for information about Ethernet controllers, and see the Ethernet controller device-driver readme file.

Try the following procedures:

- Make sure that the correct device drivers are installed and that they are at the latest level.
- Make sure that the Ethernet cable is installed correctly.
 - The cable must be securely attached at all connections. If the cable is attached but the problem remains, try a different cable.
 - If you set the Ethernet controller to operate at 100 Mbps, you must use Category 5 cabling.
 - If you directly connect two system-board trays (without a hub), or if you are not using a hub with X ports, use a crossover cable. To determine whether a hub has an X port, check the port label. If the label contains an X, the hub has an X port.
- Determine whether the hub supports auto-negotiation. If it does not, try configuring the integrated Ethernet controller manually to match the speed and duplex mode of the hub.
- Check the Ethernet controller LEDs on the system-board tray operator panel. These LEDs indicate whether there is a problem with the connector, cable, or hub.
 - The Ethernet link status LED is lit when the Ethernet controller receives a link pulse from the hub. If the LED is off, there might be a defective connector or cable or a problem with the hub.
 - The Ethernet transmit/receive activity LED is lit when the Ethernet controller sends or receives data over the Ethernet network. If the Ethernet transmit/receive activity light is off, make sure that the hub and network are operating and that the correct device drivers are installed.

- Check the LAN activity LEDs on the system-board tray operator panel. The LAN activity LEDs are lit when data is active on the Ethernet network. If the LAN activity LEDs are off, make sure that the hub and network are operating and that the correct device drivers are installed.
- Check for operating-system-specific causes of the problem.
- Make sure that the device drivers on the client and server are using the same protocol.

If the Ethernet controller still cannot connect to the network but the hardware appears to be working, the network administrator must investigate other possible causes of the error.

Solving undetermined problems

If the diagnostic tests did not diagnose the failure or if the system-board tray is inoperative, use the information in this section.

If you suspect that a software problem is causing failures (continuous or intermittent), see “Software problems” on page 62.

Damaged data in CMOS memory or damaged BIOS code can cause undetermined problems. To reset the CMOS data, use the clear CMOS jumper to override the password and clear the CMOS memory; see “System-board jumpers” on page 13 and “Clearing CMOS memory” on page 81 for more information. If you suspect that the BIOS code is damaged, see “Updating (flash-updating) the BIOS code” on page 82 and “Recovering from a BIOS update failure” on page 83 for more information.

Make sure that the power supply is working correctly. If the power supply is working correctly and reseating the system-board tray in the chassis does not correct the problem, complete the following steps:

1. Turn off the system-board tray.
2. Remove the system-board tray from the chassis.
3. If a storage enclosure is installed, remove it (see “Removing a storage enclosure from a system-board tray” on page 99); otherwise, remove the system-board tray cover (see “Removing the system-board tray cover” on page 101).
4. Remove or disconnect the following devices, one at a time, until you find the failure. Reinstall, turn on, and re-configure the system-board tray each time.
 - Any external devices.
 - Each adapter.
 - Each hard disk drive.
 - Memory modules. The minimum configuration requirement is two 2 GB DIMMs on the system board.

The following minimum configuration is required for the system-board tray to start:

- Chassis
 - System-board tray
 - One microprocessor
 - Two 2GB DIMMs
5. Install and turn on the system-board tray. If the problem remains, suspect the following components in the following order:
 - a. DIMM
 - b. System-board tray
 - c. Microprocessor

If the problem is solved when you remove an adapter but the problem recurs when you reinstall the same adapter, suspect the adapter; if the problem recurs when you replace the adapter with a different one, suspect the system-board tray.

If you suspect a networking problem and the system-board tray passes all the system tests, suspect a network cabling problem that is external to the system.

Problem determination tips

Because of the variety of hardware and software combinations that you can encounter, have as much of the following information available as possible when you request assistance from IBM:

- Machine type and model
- Microprocessor and hard disk drive upgrades
- Failure symptoms
 - Does the system-board tray fail the diagnostic programs? If so, what are the error codes?
 - What occurs? When? Where?
 - Does the failure occur on a single system-board tray or on multiple trays?
 - Is the failure repeatable?
 - Has the current configuration ever worked?
 - What changes, if any, were made before it failed?
 - Is this the original reported failure, or has this failure been reported before?
- Diagnostic program type and version level
- Hardware configuration (print screen of the system summary)
- BIOS code level
- Operating-system type and version level

You can solve some problems by comparing the configuration and software setups between working and nonworking system-board trays. When you compare system-board trays to each other for diagnostic purposes, consider them identical only if all the following factors are exactly the same in all the system-board trays:

- Machine type and hardware configuration
- BIOS level
- Adapters and attachments, in the same locations
- Address jumpers, terminators, and cabling
- Software versions and levels
- Diagnostic program type and version level
- Configuration option settings
- Operating-system control-file setup

See Appendix A, “Getting help and technical assistance,” on page 149 for information about calling IBM for service.

Chapter 4. Parts listing

This section lists the replaceable components that are available for the iDataPlex dx360 system-board tray, the 2U chassis, and the storage enclosure.

Replaceable components are of three types:

- **Tier 1 customer replaceable unit (CRU):** Replacement of Tier 1 CRUs is your responsibility. If IBM installs a Tier 1 CRU at your request, you will be charged for the installation.
- **Tier 2 customer replaceable unit:** You may install a Tier 2 CRU yourself or request IBM to install it, at no additional charge, under the type of warranty service that is designated for your server.
- **Field replaceable unit (FRU):** FRUs must be installed only by trained service technicians.

For an updated parts listing on the Web, complete the following steps:

Note: Changes are made periodically to the IBM Web site. The actual procedure might vary slightly from what is described in this document.

1. Go to <http://www.ibm.com/systems/support/>.
2. Under **Product support**, click **System x**.
3. Under **Popular links**, click **Parts documents**.
4. From the **Product family** menu, select **System x iDataPlex dx360 server** and click **Go**.

For information about the terms of the warranty and getting service and assistance, see the *Warranty and Support Information* document.

2U chassis components

The following replaceable components are available for the Types 6313, 6385, and 7831 2U flex chassis.

Note: The illustrations in this document might differ slightly from your hardware.

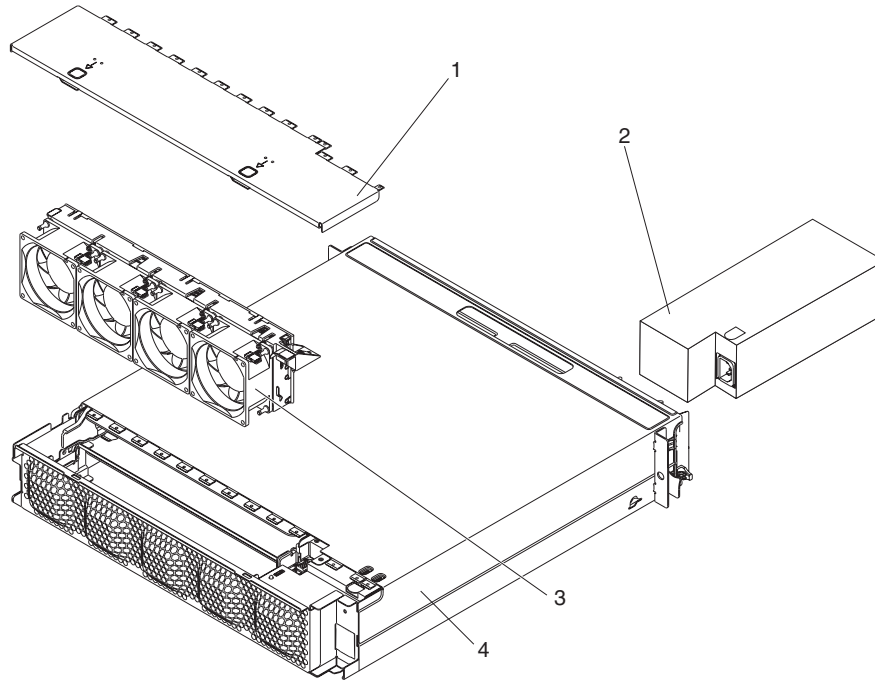


Table 6. CRUs and FRUs, 2U chassis

Index	Description	CRU No. (Tier 1)	CRU No. (Tier 2)	FRU No.
1	Top cover	44W4791		
2	900 W power supply		43X3284	
3	Fan assembly	44W4792		
4	2U flex chassis			44W4790
	Rail kit		44W4793	
	Enterprise rack rail kit		44W4794	
	Power cord, 30A/208V	39M5493		
	Power cord, 32A/240V	39M5495		
	Power cord, 32A/250V	39M5497		
	Power cord, 30A/250V	39M5499		
	Label kit	44W4849		

dx360 system-board tray components

The following replaceable components are available for the iDataPlex dx360 Types 6316, 6390, and 7833 system-board tray.

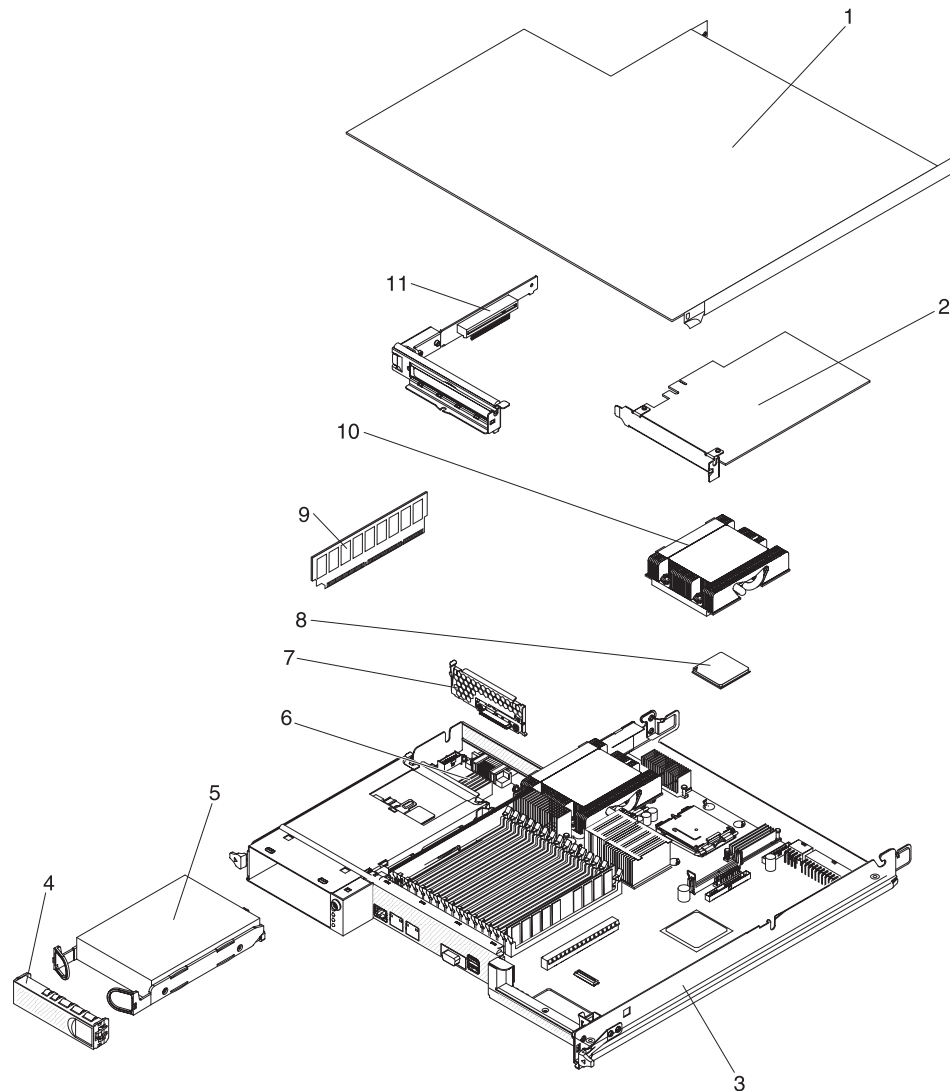


Table 7. CRUs and FRUs, dx360 system-board tray

Index	Description	CRU No. (Tier 1)	CRU No. (Tier 2)	FRU No.
1	System-board tray cover	44W4795		
2	Qlogic iSCSI double-port host bus adapter		42C1772	
2	Intel Pro1000 Ethernet adapter		42C1752	
2	SAS host bus adapter		44E8690	
3	System-board tray with system board			46C6874
4	3.5-inch drive filler panel	44W4802		
5	Hard disk drive, 3.5-inch 160 GB simple-swap SATA	39M4507		
5	Hard disk drive, 3.5-inch 250 GB simple-swap SATA	39M4511		
5	Hard disk drive, 3.5-inch 500 GB simple-swap SATA	39M4517		

Table 7. CRUs and FRUs, dx360 system-board tray (continued)

Index	Description	CRU No. (Tier 1)	CRU No. (Tier 2)	FRU No.
5	Hard disk drive, 3.5-inch 750 GB simple-swap SATA	43W7575		
5	Hard disk drive, 3.5-inch 1 TB simple-swap SATA	43W7625		
5	Hard disk drive, 3.5-inch 146 GB simple-swap SAS	39R7362		
5	Hard disk drive, 3.5-inch 300 GB simple-swap SAS	43X0817		
5	Hard disk drive, 3.5-inch 450 GB simple-swap SAS	42D0524		
6	Power supply paddle card domain A			43X3266
7	One-bay hard disk drive bracket and cable assembly, SATA 1x		46C6896	
7	One-bay hard disk drive bracket and cable assembly, SAS 1x		44T0679	
8	Microprocessor, Intel Xeon L5410 2.33 GHz/1333 MHz quad core 50W			44W1953
8	Microprocessor, Intel Xeon E5440 2.83 GHz/1333 MHz quad core 80W			44R5648
8	Microprocessor, Intel Xeon L5420 2.5 GHz/1333 MHz quad core 50W			44E5144
8	Microprocessor, Intel Xeon E5472 3.0 GHz/1600 MHz quad core 80W			46M2992
8	Microprocessor, Intel Xeon E5462 2.8 GHz/1600 MHz quad core 80W			46M2994
8	Microprocessor, Intel Xeon L5240 3.0 GHz/1333 MHz dual core 40W			46M3069
8	Microprocessor, Intel Xeon 2.5 GHz/1333 MHz quad core 80W			44R5646
8	Microprocessor, Intel Xeon 2.6 GHz/1333 MHz quad core 80W			44R5647
9	Memory, 2 GB DIMM, DDR2-667 PC2-5300 555 fully buffered DIMM with AMB+	46C7422		
9	Memory, 4 GB DIMM, DDR2-667 PC2-5300 555 fully buffered DIMM with AMB+	46C7423		
9	Memory, 2 GB DIMM, DDR2-800 PC2-6400 666 fully buffered DIMM with AMB+	46C7568		
9	Memory, 4 GB DIMM, DDR2-800 PC2-6400 666 fully buffered DIMM with AMB+	46C7569		
10	Heat sink			44W4759
11	One-slot PCIe riser-card assembly (1 x 16)	44W4803		
	Microprocessor filler	44W4807		
	Thermal grease	41Y9292		
	Label kit	44W4884		
	Miscellaneous parts kit		44W4883	
	Front-panel assembly		46C6871	
	Thermistor two-drop cable		46C6873	
	Hard disk drive 16-pin four-drop power cable		44W4822	

Consumable parts are not covered by the IBM Statement of Limited Warranty. The following consumable parts are available for purchase from the retail store.

Table 8. Consumable parts, dx360 system-board tray

Description	Part number
Battery, 3.0 volt	33F8354

To order a consumable part, complete the following steps:

1. Go to <http://www.ibm.com>.
2. From the **Products** menu, select **Upgrades, accessories & parts**.
3. Click **Obtain maintenance parts**; then, follow the instructions to order the part from the retail store.

If you need help with your order, call the toll-free number that is listed on the retail parts page, or contact your local IBM representative for assistance.

Storage enclosure components

The following replaceable components are available for the iDataPlex storage enclosure.

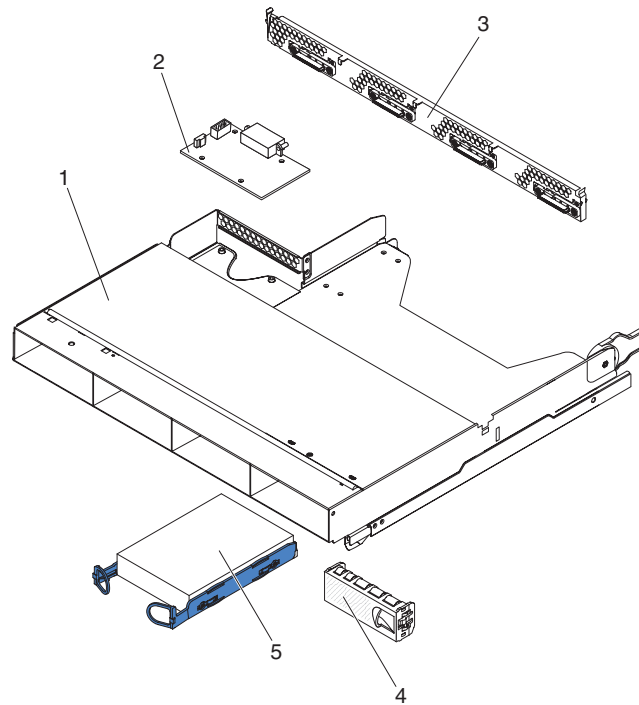


Table 9. CRUs and FRUs, storage enclosure

Index	Description	CRU No. (Tier 1)	CRU No. (Tier 2)	FRU No.
1	Storage enclosure		44W4798	
2	Power supply paddle card domain B		39Y7311	
3	Four-bay hard disk drive bracket and cable assembly, SAS 4 to 4x		44T0675	
3	Four-bay hard disk drive bracket and cable assembly, SATA 4 to 1x		44T0672	
4	3.5-inch simple-swap drive filler panel	44W4802		

Table 9. CRUs and FRUs, storage enclosure (continued)

Index	Description	CRU No. (Tier 1)	CRU No. (Tier 2)	FRU No.
5	Hard disk drive, 3.5-inch 160 GB simple-swap SATA	39M4507		
5	Hard disk drive, 3.5-inch 250 GB simple-swap SATA	39M4511		
5	Hard disk drive, 3.5-inch 500 GB simple-swap SATA	39M4517		
5	Hard disk drive, 3.5-inch 750 GB simple-swap SATA	43W7575		
5	Hard disk drive, 3.5-inch 1 TB simple-swap SATA	43W7625		
5	Hard disk drive, 3.5-inch 146 GB simple-swap SAS	39R7362		
5	Hard disk drive, 3.5-inch 300 GB simple-swap SAS	43X0817		
5	Hard disk drive, 3.5-inch 450 GB simple-swap SAS	42D0524		

Power cords

For your safety, IBM provides a power cord with a grounded attachment plug to use with this IBM product. To avoid electrical shock, always use the power cord and plug with a properly grounded outlet.

IBM power cords used in the United States and Canada are listed by Underwriter's Laboratories (UL) and certified by the Canadian Standards Association (CSA).

For units intended to be operated at 115 volts: Use a UL-listed and CSA-certified cord set consisting of a minimum 18 AWG, Type SVT or SJT, three-conductor cord, a maximum of 15 feet in length and a parallel blade, grounding-type attachment plug rated 15 amperes, 125 volts.

For units intended to be operated at 230 volts (U.S.): Use a UL-listed and CSA-certified cord set consisting of a minimum 18 AWG, Type SVT or SJT, three-conductor cord, a maximum of 15 feet in length and a tandem blade, grounding-type attachment plug rated 15 amperes, 250 volts.

For units intended to be operated at 230 volts (outside the U.S.): Use a cord set with a grounding-type attachment plug. The cord set should have the appropriate safety approvals for the country in which the equipment will be installed.

IBM power cords for a specific country or region are usually available only in that country or region.

IBM power cord part number	Used in these countries and regions
39M5206	China
39M5102	Australia, Fiji, Kiribati, Nauru, New Zealand, Papua New Guinea

IBM power cord part number	Used in these countries and regions
39M5123	Afghanistan, Albania, Algeria, Andorra, Angola, Armenia, Austria, Azerbaijan, Belarus, Belgium, Benin, Bosnia and Herzegovina, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo (Democratic Republic of), Congo (Republic of), Cote D'Ivoire (Ivory Coast), Croatia (Republic of), Czech Republic, Dahomey, Djibouti, Egypt, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Finland, France, French Guyana, French Polynesia, Germany, Greece, Guadeloupe, Guinea, Guinea Bissau, Hungary, Iceland, Indonesia, Iran, Kazakhstan, Kyrgyzstan, Laos (People's Democratic Republic of), Latvia, Lebanon, Lithuania, Luxembourg, Macedonia (former Yugoslav Republic of), Madagascar, Mali, Martinique, Mauritania, Mauritius, Mayotte, Moldova (Republic of), Monaco, Mongolia, Morocco, Mozambique, Netherlands, New Caledonia, Niger, Norway, Poland, Portugal, Reunion, Romania, Russian Federation, Rwanda, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, Slovakia, Slovenia (Republic of), Somalia, Spain, Suriname, Sweden, Syrian Arab Republic, Tajikistan, Tahiti, Togo, Tunisia, Turkey, Turkmenistan, Ukraine, Upper Volta, Uzbekistan, Vanuatu, Vietnam, Wallis and Futuna, Yugoslavia (Federal Republic of), Zaire
39M5130	Denmark
39M5144	Bangladesh, Lesotho, Macao, Maldives, Namibia, Nepal, Pakistan, Samoa, South Africa, Sri Lanka, Swaziland, Uganda
39M5151	Abu Dhabi, Bahrain, Botswana, Brunei Darussalam, Channel Islands, China (Hong Kong S.A.R.), Cyprus, Dominica, Gambia, Ghana, Grenada, Iraq, Ireland, Jordan, Kenya, Kuwait, Liberia, Malawi, Malaysia, Malta, Myanmar (Burma), Nigeria, Oman, Polynesia, Qatar, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Seychelles, Sierra Leone, Singapore, Sudan, Tanzania (United Republic of), Trinidad and Tobago, United Arab Emirates (Dubai), United Kingdom, Yemen, Zambia, Zimbabwe
39M5158	Liechtenstein, Switzerland
39M5165	Chile, Italy, Libyan Arab Jamahiriya
39M5172	Israel
39M5095	220 - 240 V Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, Bolivia, Caicos Islands, Canada, Cayman Islands, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Jamaica, Mexico, Micronesia (Federal States of), Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Saudi Arabia, Thailand, Taiwan, United States of America, Venezuela
39M5081	110 - 120 V Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, Bolivia, Caicos Islands, Canada, Cayman Islands, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Jamaica, Mexico, Micronesia (Federal States of), Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Saudi Arabia, Thailand, Taiwan, United States of America, Venezuela
39M5219	Korea (Democratic People's Republic of), Korea (Republic of)

IBM power cord part number	Used in these countries and regions
39M5199	Japan
39M5068	Argentina, Paraguay, Uruguay
39M5226	India
39M5233	Brazil

Chapter 5. Removing and replacing server components

Replaceable components are of three types:

- **Tier 1 customer replaceable unit (CRU):** Replacement of Tier 1 CRUs is your responsibility. If IBM installs a Tier 1 CRU at your request, you will be charged for the installation.
- **Tier 2 customer replaceable unit:** You may install a Tier 2 CRU yourself or request IBM to install it, at no additional charge, under the type of warranty service that is designated for your server.
- **Field replaceable unit (FRU):** FRUs must be installed only by trained service technicians.

See Chapter 4, “Parts listing,” on page 87 to determine whether a component is a Tier 1 CRU, Tier 2 CRU, or FRU.

Installation guidelines

Before you remove or replace a component, read the following information:

- Read the safety information that begins on page vii and the guidelines in “Handling static-sensitive devices” on page 96. This information will help you work safely.
- Observe good housekeeping in the area where you are working. Place removed covers and other parts in a safe place.
- Do not attempt to lift an object that you think is too heavy for you. If you have to lift a heavy object, observe the following precautions:
 - Make sure that you can stand safely without slipping.
 - Distribute the weight of the object equally between your feet.
 - Use a slow lifting force. Never move suddenly or twist when you lift a heavy object.
 - To avoid straining the muscles in your back, lift by standing or by pushing up with your leg muscles.
- Back up all important data before you make changes to disk drives.
- Have a small Phillips screwdriver available.
- You do not have to turn off the system-board tray to install or replace hot-plug Universal Serial Bus (USB) devices. However, you must shut down the operating system and turn off the system-board tray before you remove simple-swap drives or before you remove the system-board tray from a chassis.
- Blue on a component indicates touch points, where you can grip the component to remove it or install it, open or close a latch, and so on.
- Orange on a component or an orange label on or near a component indicates that the component can be hot-swapped, which means that if the system-board tray and operating system support hot-swap capability, you can remove or install the component while the system-board tray is running. (Orange can also indicate touch points on hot-swap components.) See the instructions for removing or installing a specific hot-swap component for any additional procedures that you might have to perform before you remove or install the component.

System reliability guidelines

To help ensure proper cooling and system reliability, make sure that the following requirements are met:

- Each of the drive bays has a drive or a filler panel and electromagnetic compatibility (EMC) shield installed in it.
- You have followed the cabling instructions that come with optional adapters.
- The server battery is operational. If the battery becomes defective, replace it immediately.
- You have replaced one or both system-board trays within 2 minutes of removal.

Handling static-sensitive devices

Attention: Static electricity can damage electronic devices. To avoid damage, keep static-sensitive devices in their static-protective packages until you are ready to install them.

To reduce the possibility of damage from electrostatic discharge, observe the following precautions:

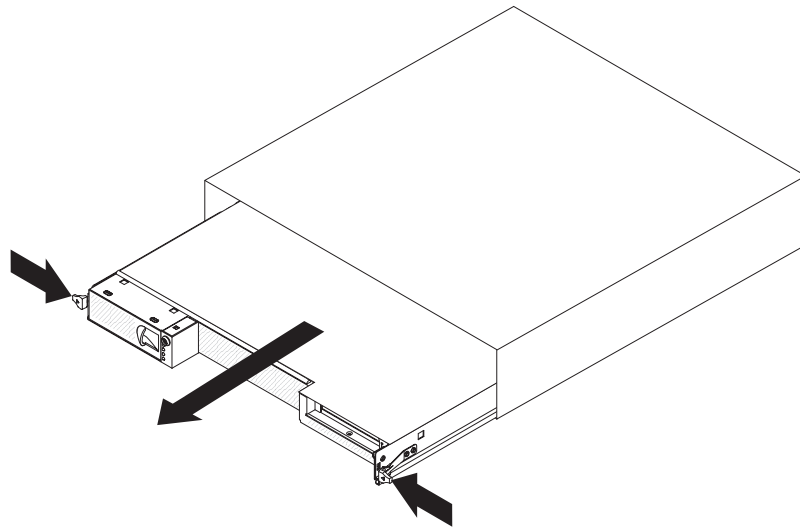
- Limit your movement. Movement can cause static electricity to build up around you.
- The use of a grounding system is recommended. For example, wear an electrostatic-discharge wrist strap, if one is available.
- Handle the device carefully, holding it by its edges or its frame.
- Do not touch solder joints, pins, or exposed circuitry.
- Do not leave the device where others can handle and damage it.
- While the device is still in its static-protective package, touch it to an unpainted metal surface on the outside of the chassis, storage enclosure, or system-board tray for at least 2 seconds. This drains static electricity from the package and from your body.
- Remove the device from the package and install it directly into the chassis, storage enclosure, or system-board tray without setting down the device. If it is necessary to set down the device, put it back into the static-protective package. Do not place the device on the chassis or system-board tray cover or on a metal surface.
- Take additional care when handling devices during cold weather. Heating reduces indoor humidity and increases static electricity.

Returning a device or component

If you are instructed to return a device or component, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Removing the system-board tray from a 2U chassis

Attention: When two system-board trays are installed in the chassis, do not operate the upper system-board tray with the bottom system-board tray removed or powered off, except for servicing. When the bottom system-board tray is removed or powered-off, chassis-level system management information is not read correctly. For example, chassis fan speeds and temperatures may be returned as zero values. In this situation, the unit will continue to operate normally, since the power supply and fans are designed to operate independently.



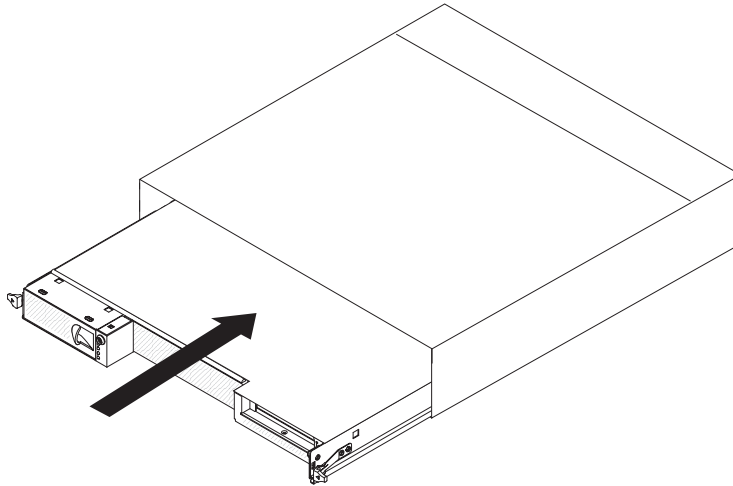
To remove the system-board tray from a 2U chassis, complete the following steps.

Notes:

1. If two system-board trays are installed in the chassis, they can be removed independently of each other.
2. If a storage enclosure is installed on the system-board tray, you will remove the storage enclosure and the system-board tray from the chassis as one assembly.
1. Read the safety information that begins on page vii and “Installation guidelines” on page 95.
2. Turn off the system-board tray and all attached devices (see “Turning off the system-board tray” on page 9).
3. If external cables are connected to the front of the system-board tray, note where they are connected; then, remove them.
4. Press in on the two release handles, pull the system-board tray out of the chassis, and set it on a flat, static-protective surface.

Installing the system-board tray in a 2U chassis

Attention: You cannot insert the system-board tray into a chassis until the cover is installed and closed or a storage enclosure is installed. Do not attempt to override this protection.



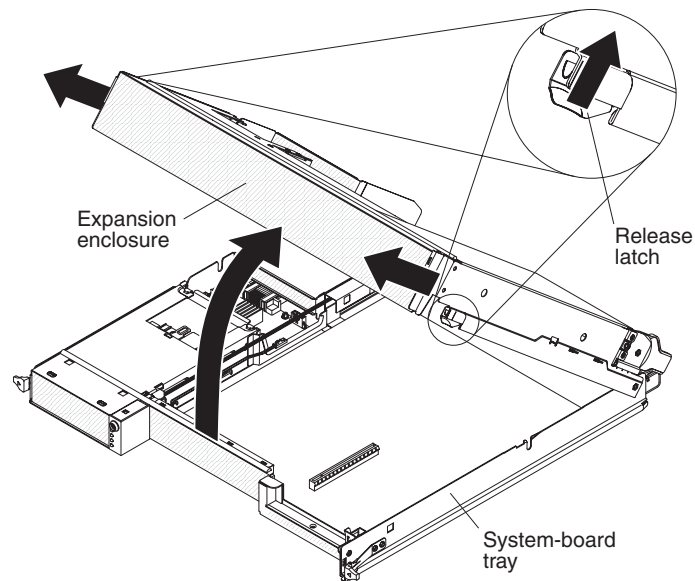
To install the system-board tray in a chassis, complete the following steps:

1. If a storage enclosure is installed on the system-board tray, make sure that the blue air damper actuator is parallel to the system-board tray before you slide the assembly into the chassis.
2. Slide the system-board tray into the chassis until it stops and the release handles click into place.
3. Reconnect the cables to the front of the system-board tray.
4. Turn on the system-board tray (see “Turning on the system-board tray” on page 9).
5. Make sure that the power-on LED on the system-board tray operator panel is lit continuously, indicating that the system-board tray is receiving power and is turned on.

If you have changed the configuration of the system-board tray or if you are installing a different system-board tray from the one that you removed, you might have to configure the system-board tray, using the BIOS Setup Utility program. See “Using the BIOS Setup Utility program” on page 141 for more information.

Removing a storage enclosure from a system-board tray

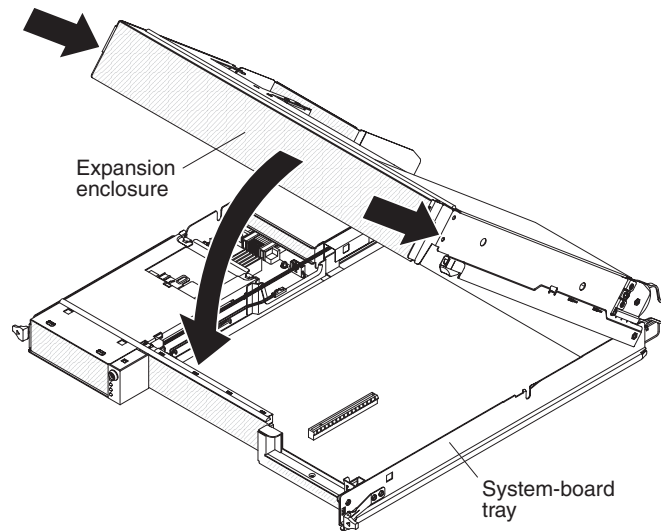
To remove a storage enclosure from a system-board tray, complete the following steps.



1. Read the safety information that begins on page vii and “Installation guidelines” on page 95.
2. If the system-board tray is installed in a chassis, remove it (see “Removing the system-board tray from a 2U chassis” on page 97).
3. Carefully set the system-board tray on a flat, static-protective surface.
4. If hard disk drives are installed in the storage enclosure, note their locations and remove them (see “Removing a 3.5-inch simple-swap hard disk drive” on page 103).
5. Note the routing and connection locations of the cables that connect the storage enclosure to the system-board tray; then, disconnect the cables.
6. Pull the release latch on each side of the storage enclosure outward; then, rotate the storage enclosure open.
7. Using care not to pull on the cables, lift the storage enclosure from the system-board tray and set it on a flat, static-protective surface.

Installing a storage enclosure on a system-board tray

To install a storage enclosure on a system-board tray, complete the following steps.



1. Orient the storage enclosure above the system-board tray.
2. Lower the storage enclosure so that the pins at the rear of the enclosure slide down into the slots at the rear of the system-board tray. Before you lower the storage enclosure, make sure that all components are installed and seated correctly, all internal cables are correctly routed, and you have not left loose tools or parts inside the system-board tray.
3. If you disconnected cables when you removed the storage enclosure, reconnect them.
4. Pivot the storage enclosure down onto the system-board tray until it clicks into place.
5. Install the hard disk drives, if you removed any when you removed the storage enclosure (see "Installing a 3.5-inch simple-swap hard disk drive" on page 104).
6. Install the system-board tray in the chassis (see "Installing the system-board tray in a 2U chassis" on page 98).

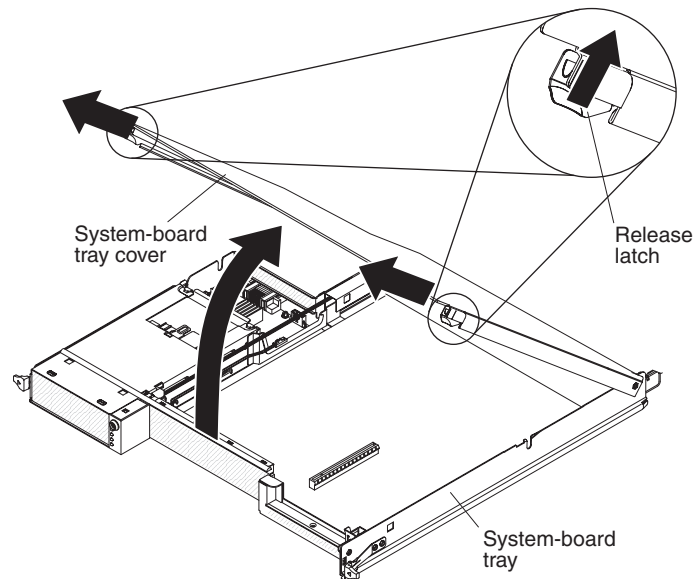
Removing and replacing Tier 1 CRUs

Replacement of consumable parts and Tier 1 CRUs is your responsibility. If IBM installs a consumable part or Tier 1 CRU at your request, you will be charged for the installation.

Note: The illustrations in this document might differ slightly from your hardware.

Removing the system-board tray cover

Note: If a storage enclosure is installed on the system-board tray, remove it (see “Removing a storage enclosure from a system-board tray” on page 99).

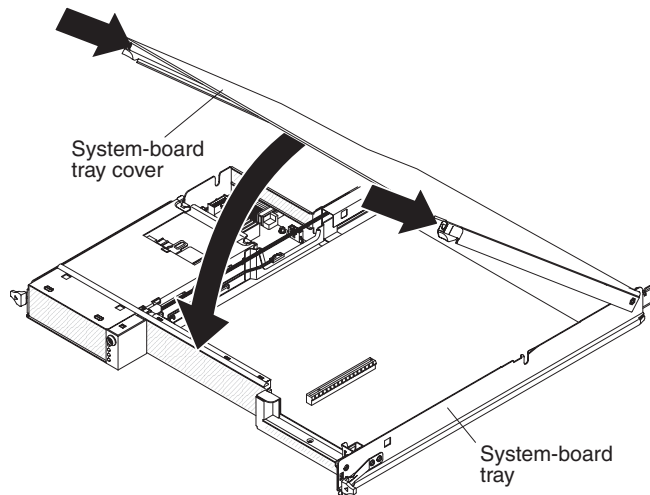


To remove the system-board tray cover, complete the following steps:

1. Read the safety information that begins on page vii and “Installation guidelines” on page 95.
2. If the system-board tray is installed in a chassis, remove it (see “Removing the system-board tray from a 2U chassis” on page 97).
3. Carefully set the system-board tray on a flat, static-protective surface, with the cover side up.
4. Pull the cover release latch on each side of the system-board tray outward and lift the cover open.
5. Lift the cover from the system-board tray and store it for future use.
6. If you are instructed to return the system-board tray cover, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing the system-board tray cover

Note: If a storage enclosure is installed on the system-board tray, the system-board tray cover is not used.

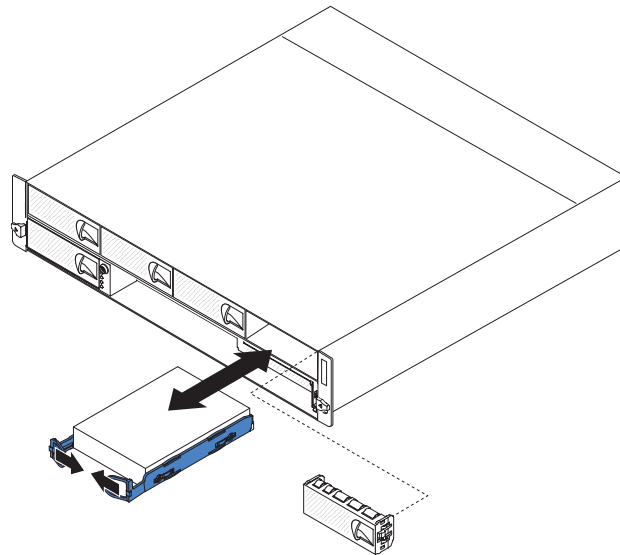


To install the system-board tray cover, complete the following steps:

1. Lower the cover so that the pins at the rear of the cover slide down into the slots at the rear of the system-board tray. Before you close the cover, make sure that all components are installed and seated correctly, all internal cables are correctly routed, and you have not left loose tools or parts inside the system-board tray.
2. Pivot the cover to the closed position until it clicks into place.
3. Install the system-board tray in the chassis (see “Installing the system-board tray in a 2U chassis” on page 98).

Removing a 3.5-inch simple-swap hard disk drive

Note: The following illustration and procedure describe how to remove a 3.5-inch simple-swap hard disk drive from the storage enclosure. Removing a 3.5-inch simple-swap hard disk drive from the system-board tray is similar.

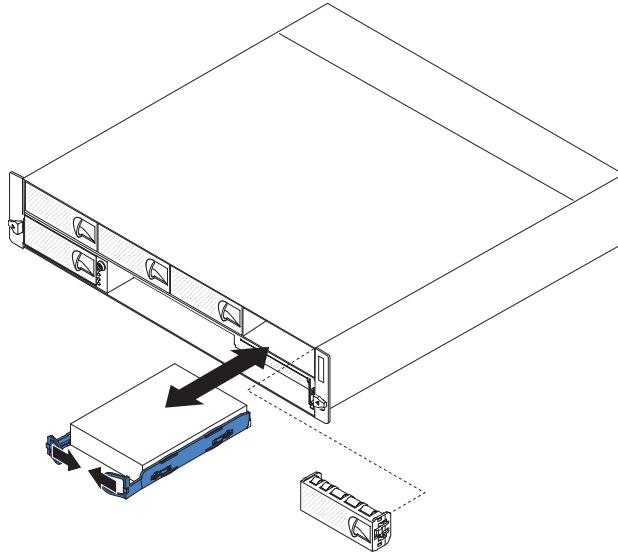


To remove a 3.5-inch simple-swap hard disk drive, complete the following steps:

1. Read the safety information that begins on page vii and “Installation guidelines” on page 95.
2. If the system-board tray is operating, shut down the operating system; then, press the power-control button to turn off the system-board tray (see “Turning off the system-board tray” on page 9 for more information).
3. Pull the 3.5-inch filler panel out of the bay for the drive that you want to remove. Save the filler panel for future use.
4. Pull the loops of the drive toward each other; then, pull the drive out of the drive bay.
5. Install a new drive in the bay or reinstall the 3.5-inch filler panel.
6. If you are instructed to return the hard disk drive, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing a 3.5-inch simple-swap hard disk drive

Note: The following illustration and procedure describe how to install a 3.5-inch simple-swap hard disk drive in the storage enclosure. Installing a 3.5-inch simple-swap hard disk drive in the system-board tray is similar.



To install a 3.5-inch simple-swap hard disk drive, complete the following steps:

1. Touch the static-protective package that contains the hard disk drive to any unpainted metal surface on the outside of the system-board tray or storage enclosure; then, remove the hard disk drive from the package.

Attention: Do not press on the top of the drive. Pressing the top might damage the drive.

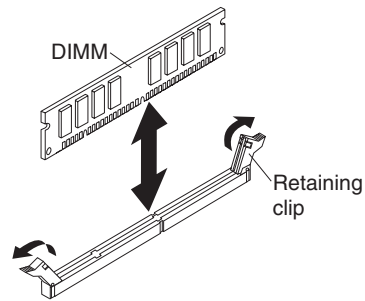
2. Align the drive with the guide rails in the drive bay.
3. Pull the loops of the drive toward each other; then, carefully slide the drive into the bay until it stops, and release the loops.

Note: Do not release the loops on the drive until it is completely seated.

4. Install the filler panel in the drive bay.
5. Turn on the system-board tray (see “Turning on the system-board tray” on page 9).

Removing a memory module

To remove a DIMM from the system-board tray, complete the following steps.



1. Read the safety information that begins on page vii and “Installation guidelines” on page 95
2. If the system-board tray is installed in a chassis, remove it (see “Removing the system-board tray from a 2U chassis” on page 97).
3. If a storage enclosure is installed, remove it (see “Removing a storage enclosure from a system-board tray” on page 99); otherwise, remove the system-board tray cover (see “Removing the system-board tray cover” on page 101).
4. Locate the DIMM connectors on the system board (see “System-board connectors” on page 10).
Attention: To avoid breaking the retaining clips or damaging the DIMM connectors, handle the clips gently.
5. Move the DIMM retaining clips on the side of the DIMM connector to the open position by pressing the retaining clips away from the center of the DIMM connector.
6. Using your fingers, lift the DIMM out of the DIMM connector.
7. If you are instructed to return the DIMM, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing a memory module

When you install memory, you must install a pair of matched DIMMs. If you are replacing a faulty DIMM, make sure that the replacement DIMM is the correct type of memory (see the Chapter 4, “Parts listing,” on page 87 for a list of memory that is compatible with the server). Install the DIMMs in the following order.

- Within a branch, DIMMs must be populated in slot order starting with Slot 1 for each channel, followed by slot 2, then slot 3, and ending with slot 4.
- DIMMs must be populated in matching pairs across channels within a given branch. Therefore, when populating DIMM pairs, the population order would be as follows:
A1 and B1; C1 and D1; A2 and B2; C2 and D2; A3 and B3; C3 and D3; A4 and B4; C4 and D4
- DIMMs that make up a given pair must match with respect to size, speed, and organization.
- DIMM size can vary from one DIMM pair to another, however, speed and organization must be the same. For example, DIMM Pair A1 and B1 are populated with x8 1GB DDR2-667 DIMMs. DIMM Pair C1 and D1 can be populated with x8 2GB DDR2-667 DIMMs.

The following table shows the DIMM configurations that are supported for the dx360 server.

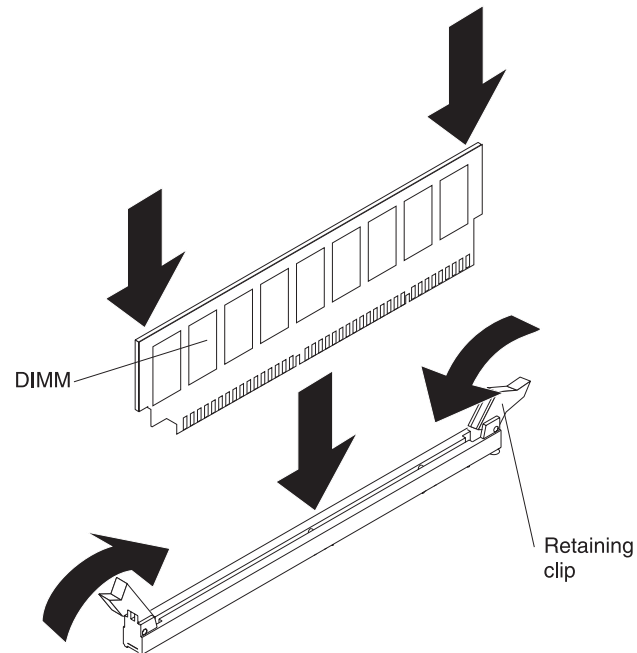
Table 10. Supported DIMM configurations

Branch 0								Branch 1							
Channel A				Channel B				Channel C				Channel D			
A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3	D4
X				X											
X				X				X				X			
X	X			X	X			X	X			X	X		
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Legend:															
X	Slot is populated: Supported configuration.														
	Slot is not populated.														

Notes:

1. For best performance, the number of DIMMs installed should be balanced across both memory branches. For example, a four DIMM configuration will perform better than a two DIMM configuration and should be installed in DIMM Slots A1, B1, C1, and D1. An eight DIMM configuration will perform better than a six DIMM configuration.
2. The minimum memory upgrade increment is two DIMMs per branch. The DIMM options that are available for the server are 2 GB and 4 GB. The 2 GB DIMM and 4 GB DIMM option kits each contain two DIMMs.
 - The DIMMs must cover the same slot position on both channels.
 - DIMM pairs must be identical with respect to size, speed, and organization.
 - DIMMs that cover adjacent slot positions do not need to be identical.

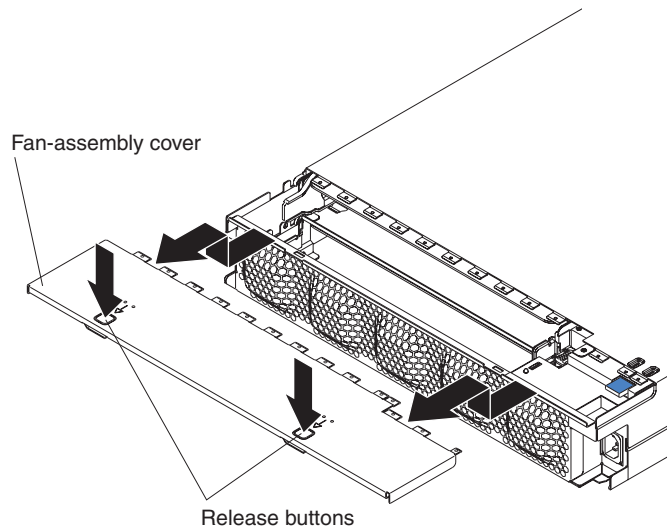
To install a DIMM in the system-board tray, complete the following steps.



1. Read the documentation that comes with the DIMM.
2. Locate the DIMM connectors on the system board (see “System-board connectors” on page 10). Determine the connectors into which you will install the DIMMs.
3. Touch the static-protective package that contains the DIMM to any unpainted metal surface on the outside of the system-board tray; then, remove the DIMM from the package.
Attention: To avoid breaking the DIMM retaining clips or damaging the DIMM connectors, open and close the clips gently.
4. Make sure that both of the connector retaining clips are in the fully open position.
5. Orient the DIMM so that the DIMM keys align correctly with the connector on the system board.
6. Insert the DIMM by applying pressure along the top of the DIMM at both ends simultaneously. Make sure that the retaining clips snap into the closed positions.
Attention: If there is a gap between the DIMM and the retaining clips, the DIMM has not been correctly installed. In this case, open the retaining clips and remove the DIMM; then, reinsert the DIMM.
7. Install the storage enclosure, if you removed one when you removed the DIMMs (see “Installing a storage enclosure on a system-board tray” on page 100); otherwise, install the system-board tray cover (see “Installing the system-board tray cover” on page 102).
8. Install the system-board tray in the chassis (see “Installing the system-board tray in a 2U chassis” on page 98).

Removing the 2U chassis top cover

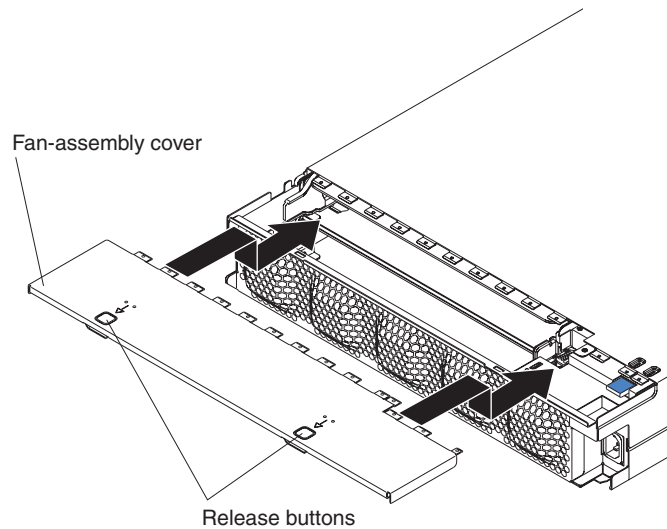
To remove the 2U chassis top cover, complete the following steps.



1. Read the safety information that begins on page vii and “Installation guidelines” on page 95.
2. If the chassis is installed in a rack, remove it (see “Removing the 2U chassis from a Type 7825 rack” on page 129).
3. Press the two cover-release buttons and slide the cover toward the rear of the chassis to remove it.
4. Save the top cover for future use.
5. If you are instructed to return the top cover, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing the 2U chassis top cover

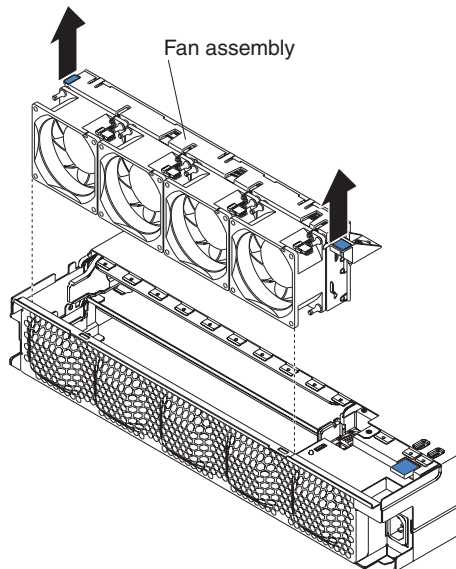
To install the 2U chassis top cover, complete the following steps.



1. Make sure that no wires are protruding that might interfere with the cover.
2. Orient the cover over the rear of the chassis so that the retention tabs on the cover align with the tabs in the chassis.
3. Slide the cover onto the chassis until the cover-release buttons click into place.
4. Install the chassis in the rack (see “Installing the 2U chassis in a Type 7825 rack” on page 130).

Removing the 2U chassis fan assembly

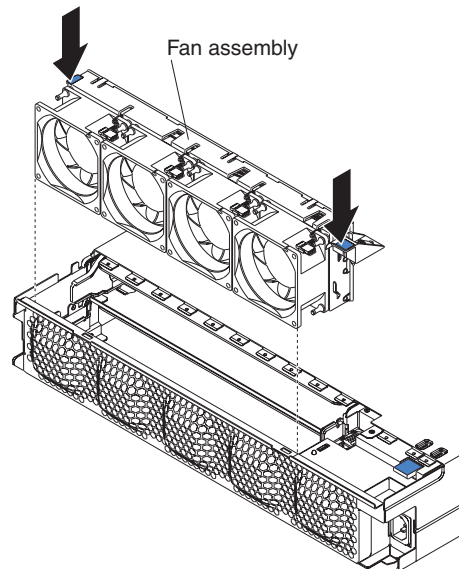
To remove the fan assembly from a 2U flex chassis, complete the following steps.



1. Read the safety information that begins on page vii and “Installation guidelines” on page 95.
2. If the chassis is installed in a rack, remove it (see “Removing the 2U chassis from a Type 7825 rack” on page 129).
3. Remove any installed system-board trays (see “Removing the system-board tray from a 2U chassis” on page 97).
4. Remove the top cover (see “Removing the 2U chassis top cover” on page 108).
5. Grasp the tab at each end of the fan assembly and lift it out of the chassis.
6. If you are instructed to return the fan assembly, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing the 2U chassis fan assembly

To install the fan assembly in a 2U flex chassis, complete the following steps.



1. Touch the static-protective package that contains the fan assembly to any unpainted metal surface on the outside of the chassis; then, remove the fan assembly from the package.
2. Orient the fan assembly over the opening in the chassis. Make sure that the power connector on the fan assembly aligns with the connector on the power supply.
3. Lower the fan assembly into the chassis and press down on the tab above the power connector to make sure that it is fully seated.
4. Install the top cover (see “Installing the 2U chassis top cover” on page 109).
5. Install any system-board trays that you removed (see “Installing the system-board tray in a 2U chassis” on page 98).
6. Install the chassis in the iDataPlex rack (see “Installing the 2U chassis in a Type 7825 rack” on page 130).

Removing the power cord

To remove the power cord, complete the following steps:

1. Read the safety information that begins on page vii and “Installation guidelines” on page 95.
2. If the 2U chassis is installed in an iDataPlex rack, remove the chassis from the rack (see “Removing the 2U chassis from a Type 7825 rack” on page 129).
3. Unplug the power cord that you are working on from the PDU.
4. Use an M3 hex driver to remove the two screws from the rail and set them aside.
5. Pull the mounting plate and power cord toward the front of the rack cabinet.
6. Separate the power cord from the mounting plate; then, set the mounting plate aside.
7. If you are instructed to return the power cord, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing the power cord

To install the power cord, complete the following steps:

1. Grasp the end of the power cord with the plug mount molded onto it in your right hand. Notice the shape of the plug and how it matches the cutout in the mounting plate.
2. Align the mounting posts on the mounting plate with the slots in the plug mount and install the power cord onto the mounting plate.
3. Position the entire assembly inside the left rail and align the mounting posts with the holes in the back of the mounting bracket on the rail.
4. Use an M3 hex driver and two M3 screws to secure the power cord and mounting plate.
5. Plug the power cord that you are working on into a PDU.
6. Install the chassis in the rack (see “Installing the 2U chassis in a Type 7825 rack” on page 130).

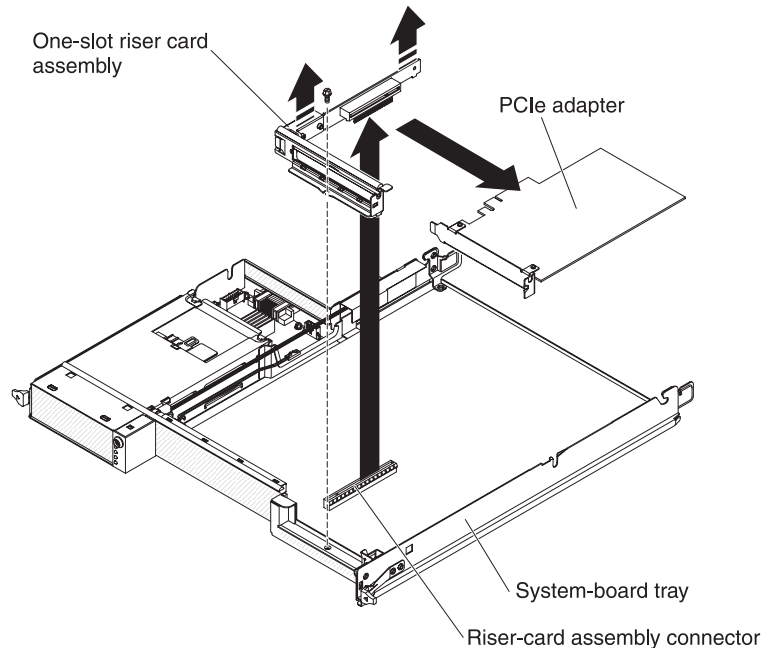
Removing and replacing Tier 2 CRUs

You may install a Tier 2 CRU yourself or request IBM to install it, at no additional charge, under the type of warranty service that is designated for your server.

Note: The illustrations in this document might differ slightly from your hardware.

Removing an adapter

To remove a PCIe adapter from the system-board tray, complete the following steps.



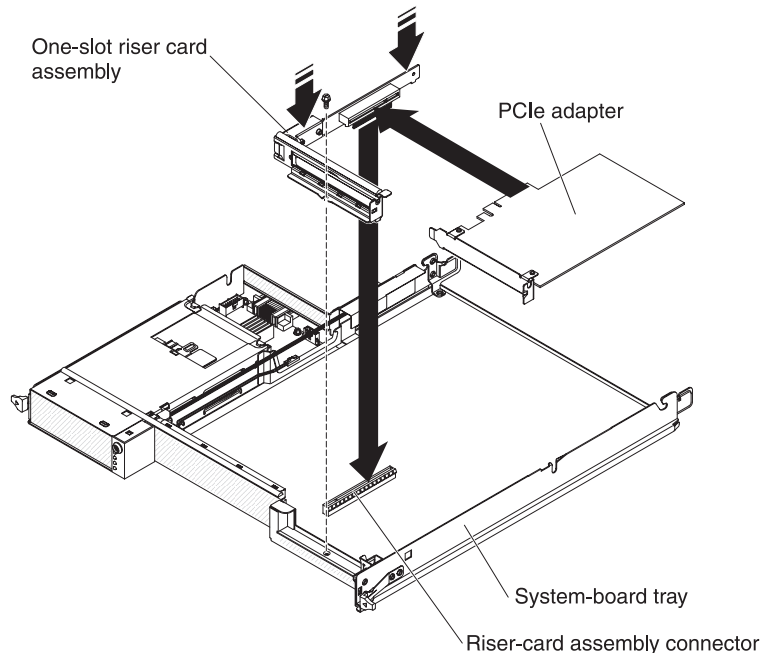
1. Read the safety information that begins on page vii and “Installation guidelines” on page 95.
2. If the system-board tray is installed in a chassis, remove it (see “Removing the system-board tray from a 2U chassis” on page 97).
3. If a storage enclosure is installed, remove it (see “Removing a storage enclosure from a system-board tray” on page 99); otherwise, remove the system-board tray cover (see “Removing the system-board tray cover” on page 101).
4. Make a note of where cables are attached to the adapter; then, disconnect the cables.
5. Remove the screw that secures the PCIe riser-card assembly to the system-board tray and save it for future use.
6. Pinch the two sides of the PCIe riser-card assembly as indicated in above graphic and pull the PCIe riser-card assembly out of the slot, evenly with both hands, on the system board.
7. Pull the adapter out of the connector on the PCIe riser-card assembly.

Note: Make sure that the adapter is pulled out carefully. Improper remove of an adapter might damage the PCIe riser-card assembly or the adapter.

8. If you are instructed to return the adapter, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing an adapter

Important: The maximum power consumption from all supply voltages for a single PCIe slot is the same as specified in PCI Local Bus Specification Revision 2.3 for conventional slots (25 W).



To install a PCIe adapter in the system-board tray, complete the following steps:

1. Touch the static-protective package that contains the adapter to any unpainted metal surface on the outside of the system-board tray; then, remove the adapter from the package. Avoid touching the components and gold-edge connectors on the adapter.
2. See the documentation that comes with the adapter to determine whether you must set any jumpers or switches.
3. Align the adapter with the PCIe connector on the riser-card assembly; then, press the adapter into the connector.

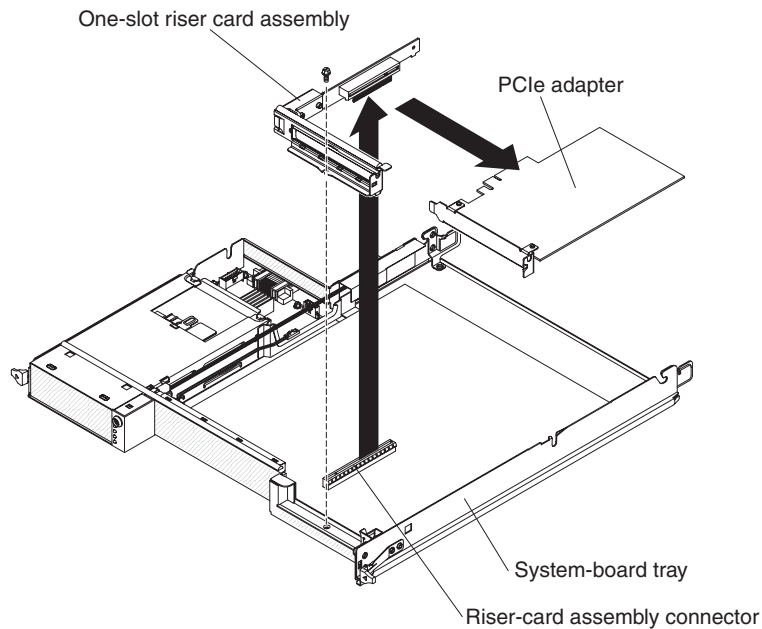
Notes:

- a. Ensure that the tab on the riser-card bracket is properly aligned with the slot on the adapter bracket.
 - b. Make sure that the adapter is inserted carefully. Improper installation of an adapter might damage the PCIe riser-card assembly or the adapter.
4. Pinch the two sides of the PCIe riser-card assembly as indicated in above graphic and insert the PCIe riser-card assembly with the adapter into the riser-card slot, evenly with both hands, on the system board. Then, install the retaining screw.
 5. If you disconnected cables when you removed the adapter, reconnect the cables.
 6. Install the storage enclosure, if you previously removed one (see “Installing a storage enclosure on a system-board tray” on page 100); otherwise, install the system-board tray cover (see “Installing the system-board tray cover” on page 102).
 7. Install the system-board tray in the chassis (see “Installing the system-board tray in a 2U chassis” on page 98).

Note: For device-driver and configuration information to complete the installation of the PCIe adapter, see the documentation that comes with the adapter.

Removing a PCIe riser-card assembly

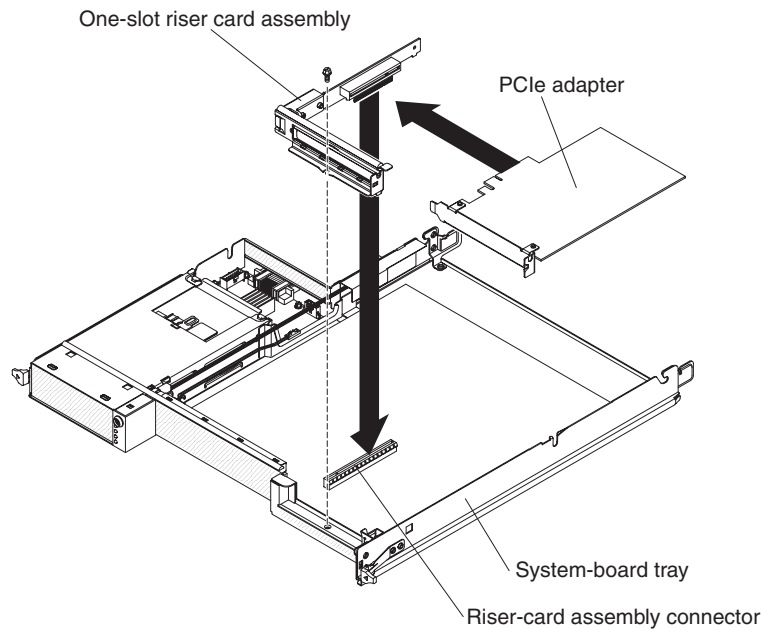
To remove a riser-card assembly from the system-board tray, complete the following steps.



1. Read the safety information that begins on page vii and “Installation guidelines” on page 95.
2. If the system-board tray is installed in a chassis, remove it (see “Removing the system-board tray from a 2U chassis” on page 97).
3. If a storage enclosure is installed, remove it (see “Removing a storage enclosure from a system-board tray” on page 99); otherwise, remove the system-board tray cover (see “Removing the system-board tray cover” on page 101).
4. Remove the screw that secures the riser-card assembly to the system-board tray and save it for future use.
5. Pull the riser-card assembly out of the connector on the system board.
6. If an adapter is installed in the riser-card assembly, remove it (see “Removing an adapter” on page 113).
7. If you are instructed to return the riser-card assembly, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing a PCIe riser-card assembly

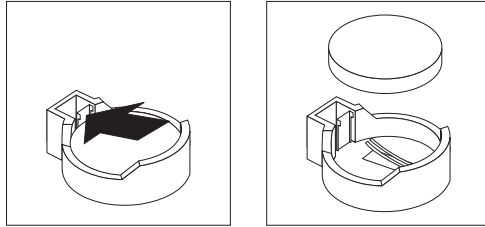
To install a PCIe riser-card assembly in the system-board tray, complete the following steps.



1. Touch the static-protective package that contains the PCIe riser-card assembly to any unpainted metal surface on the outside of the system-board tray; then, remove the riser-card assembly from the package.
2. Install and cable the PCIe adapter, if you removed one when you removed the riser-card assembly (see “Installing an adapter” on page 114).
3. Press the riser-card assembly into the riser-card assembly connector on the system board.
4. Install the retaining screw.
5. Install the storage enclosure, if you removed one when you removed the riser-card assembly (see “Installing a storage enclosure on a system-board tray” on page 100); otherwise, install the system-board tray cover (see “Installing the system-board tray cover” on page 102).
6. Install the system-board tray in the chassis (see “Installing the system-board tray in a 2U chassis” on page 98).

Removing the battery

To remove the battery, complete the following steps.



1. Read the safety information that begins on page vii and “Installation guidelines” on page 95
2. If the system-board tray is installed in a chassis, remove it (see “Removing the system-board tray from a 2U chassis” on page 97).
3. If a storage enclosure is installed, remove it (see “Removing a storage enclosure from a system-board tray” on page 99); otherwise, remove the system-board tray cover (see “Removing the system-board tray cover” on page 101).
4. Locate the battery on the system board (see “System-board connectors” on page 10).
5. Use one finger to press the top of the battery clip away from the battery. The battery pops up when it is released.
6. Use your thumb and index finger to lift the battery from the socket.
7. Dispose of the battery as required by local ordinances or regulations (see the *IBM Systems Environmental Notices and User's Guide* for more information).

Installing the battery

The following notes describe information that you must consider when you are replacing the battery in the system-board tray.

- When you are replacing the battery, you must replace it with a lithium battery of the same type from the same manufacturer.
- To order replacement batteries, call 1-800-426-7378 within the United States, and 1-800-465-7999 or 1-800-465-6666 within Canada. Outside the U.S. and Canada, call your IBM marketing representative or authorized reseller.
- After you replace the battery, you must re-configure the system-board tray and reset the system date and time.
- To avoid possible danger, read and follow the following safety statement.

Statement 2:



CAUTION:

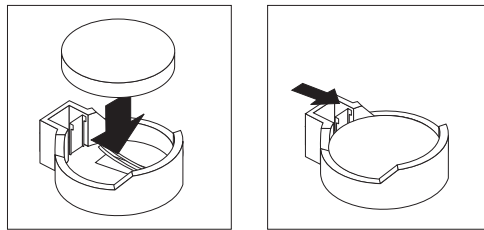
When replacing the lithium battery, use only IBM Part Number 33F8354 or an equivalent type battery recommended by the manufacturer. If your system has a module containing a lithium battery, replace it only with the same module type made by the same manufacturer. The battery contains lithium and can explode if not properly used, handled, or disposed of.

Do not:

- Throw or immerse into water
- Heat to more than 100°C (212°F)
- Repair or disassemble

Dispose of the battery as required by local ordinances or regulations.

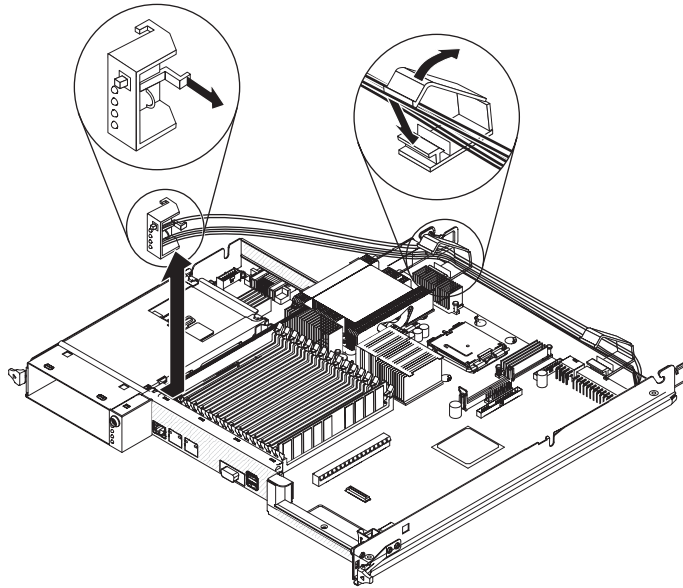
To install the battery, complete the following steps.



1. Follow any special handling and installation instructions that come with the battery.
2. Tilt the battery so that you can insert it into the socket on the side opposite the battery clip.
3. Press the battery down into the socket until it clicks into place. Make sure that the battery clip holds the battery securely.
4. Install the storage enclosure, if you removed one when you removed the battery (see “Installing a storage enclosure on a system-board tray” on page 100); otherwise, install the system-board tray cover (see “Installing the system-board tray cover” on page 102).
5. Install the system-board tray in the chassis (see “Installing the system-board tray in a 2U chassis” on page 98).
6. Turn on the system-board tray and run the BIOS Setup Utility program. Set configuration parameters as needed (see “Using the BIOS Setup Utility program” on page 141 for information).

Removing a front-panel assembly

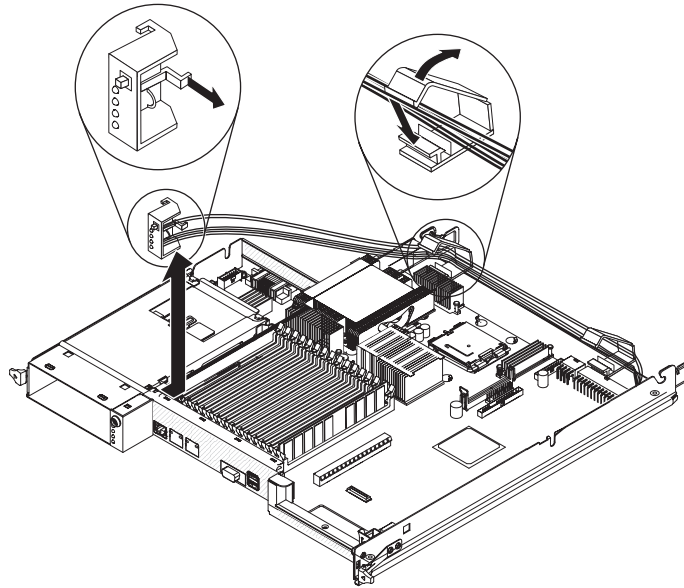
To remove the front-panel assembly, complete the following steps.



1. Read the safety information that begins on page vii and “Installation guidelines” on page 95.
2. If the system-board tray is installed in a chassis, remove it (see “Removing the system-board tray from a 2U chassis” on page 97).
3. If a storage enclosure is installed, remove it (see “Removing a storage enclosure from a system-board tray” on page 99); otherwise, remove the system-board tray cover (see “Removing the system-board tray cover” on page 101).
4. Press the release tab and slide the front-panel assembly away from the front of the system-board tray.
5. Note the cable routing and disconnect the front-panel assembly cables from the system board and power-supply paddle card.
6. Open the cable retention latches and carefully pull the assembly and cables from the system-board tray.
7. If you are instructed to return the front-panel assembly, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing a front-panel assembly

To install a front-panel assembly, complete the following steps.



1. Press the front-panel assembly into the front of the system-board tray and make sure that it is secure.
2. Connect the front-panel assembly cables to the system board and power-supply paddle card and close the cable retention latches. Carefully route the cables as you connect the cables.

Note: Make sure that all cables are properly routed and that the cables do not protrude from inside the system-board tray.

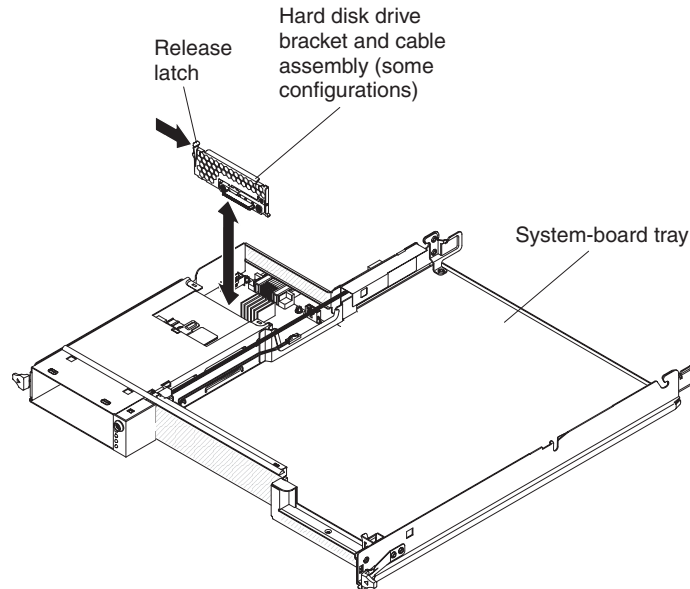
3. Install the storage enclosure, if you removed one (see “Installing a storage enclosure on a system-board tray” on page 100); otherwise, install the system-board tray cover (see “Installing the system-board tray cover” on page 102).
4. Install the system-board tray in the chassis (see “Installing the system-board tray in a 2U chassis” on page 98).

Removing and installing a hard disk drive bracket and cable assembly

The following sections describe how to remove and install a hard disk drive bracket and cable assembly in the system-board tray and storage enclosure.

Removing a one-bay hard disk drive bracket and cable assembly

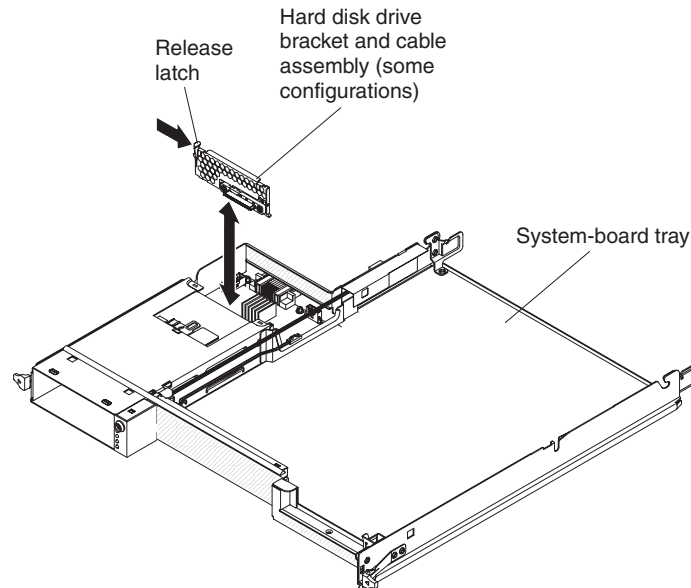
To remove a one-bay hard disk drive bracket and cable assembly from a system-board tray, complete the following steps.



1. Read the safety information that begins on page vii and “Installation guidelines” on page 95.
2. If the system-board tray is installed in a chassis, remove it (see “Removing the system-board tray from a 2U chassis” on page 97).
3. If the system-board tray has a storage enclosure attached, remove it (see “Removing a storage enclosure from a system-board tray” on page 99); otherwise, remove the system-board tray cover (see “Removing the system-board tray cover” on page 101).
4. If a 3.5-inch hard disk drive is installed in the system-board tray, remove it (see “Removing a 3.5-inch simple-swap hard disk drive” on page 103).
5. Make a note of where the hard disk drive bracket and cable assembly cables are attached; then, disconnect them.
6. Press inward on the hard disk drive bracket and cable assembly release latch; then, lift the assembly off the mounting tabs and out of the system-board tray.
7. If you are instructed to return the hard disk drive bracket and cable assembly, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing a one-bay hard disk drive bracket and cable assembly

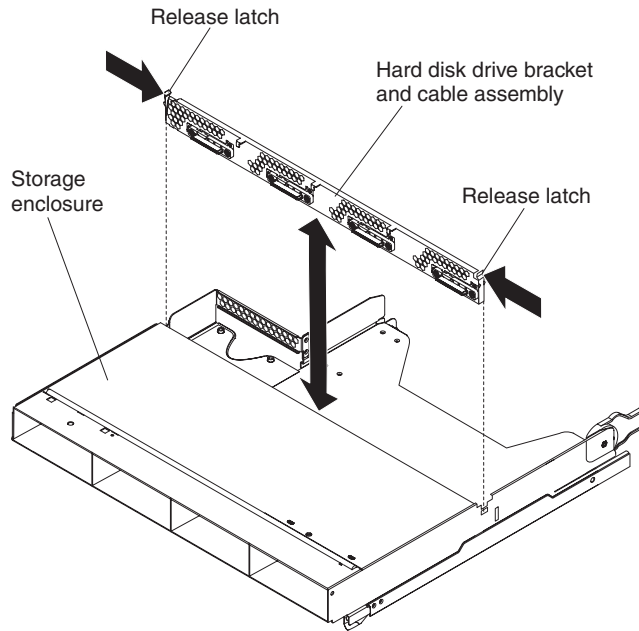
To install a one-bay hard disk drive bracket and cable assembly in a system-board tray, complete the following steps.



1. Touch the static-protective package that contains the hard disk drive bracket and cable assembly to any unpainted metal surface on the outside of the system-board tray; then, remove the hard disk drive bracket and cable assembly from the package.
2. Place the hard disk drive bracket and cable assembly on the mounting tabs inside the system-board tray; then, press down on the hard disk drive bracket and cable assembly until the release latch clicks into place.
3. Reconnect the hard disk drive bracket and cable assembly cables.
4. Install the hard disk drive, if you previously removed one from the system-board tray (see “Installing a 3.5-inch simple-swap hard disk drive” on page 104).
5. Install the storage enclosure, if you removed one from the system-board tray (see “Installing a storage enclosure on a system-board tray” on page 100); otherwise, install the system-board tray cover (see “Installing the system-board tray cover” on page 102).
6. Install the system-board tray in the chassis (see “Installing the system-board tray in a 2U chassis” on page 98).
7. If you are instructed to return the hard disk drive bracket and cable assembly, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Removing a four-bay hard disk drive bracket and cable assembly

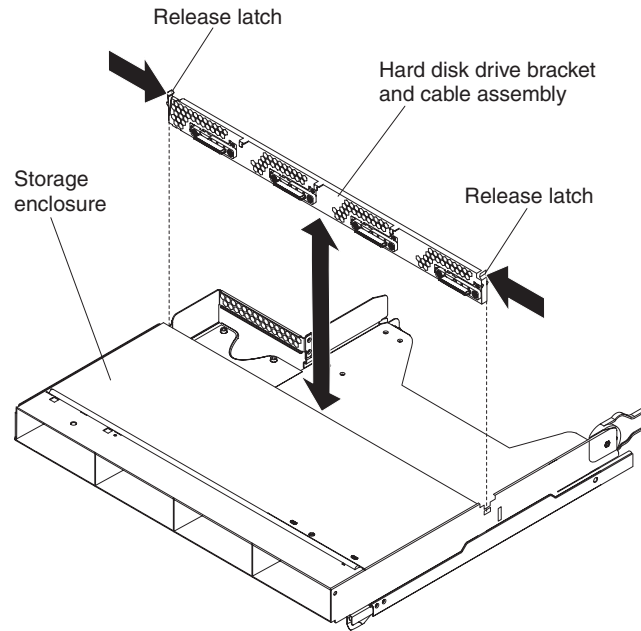
To remove a four-bay hard disk drive bracket and cable assembly from the storage enclosure, complete the following steps.



1. Read the safety information that begins on page vii and “Installation guidelines” on page 95.
2. If the system-board tray is installed in a chassis, remove it (see “Removing the system-board tray from a 2U chassis” on page 97).
3. Remove the storage enclosure from the system-board tray (see “Removing a storage enclosure from a system-board tray” on page 99).
4. Carefully set the storage enclosure on a flat, static-protective surface.
5. If hard disk drives are installed in the storage enclosure, make note of where the drives are installed; then, remove them (see “Removing a 3.5-inch simple-swap hard disk drive” on page 103).
6. Make a note of where the hard disk drive bracket and cable assembly cables are attached; then, disconnect them.
7. Press inward on the hard disk drive bracket and cable assembly release latches; then, lift the hard disk drive bracket and cable assembly off the mounting tabs and out of the storage enclosure.
8. If you are instructed to return the hard disk drive bracket and cable assembly, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing a four-bay hard disk drive bracket and cable assembly

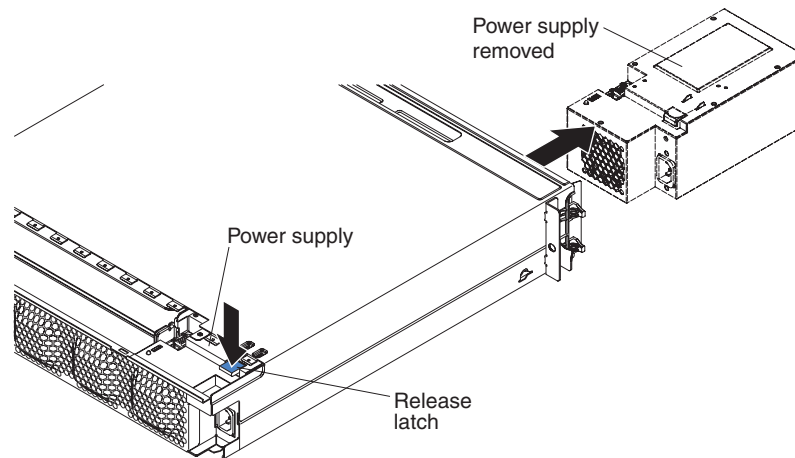
To install a four-bay hard disk drive bracket and cable assembly in the storage enclosure, complete the following steps.



1. Touch the static-protective package that contains the hard disk drive bracket and cable assembly to any unpainted metal surface on the outside of the storage enclosure; then, remove the hard disk drive bracket and cable assembly from the package.
2. Place the hard disk drive bracket and cable assembly on the mounting tabs inside the storage enclosure; then, press down on the hard disk drive bracket and cable assembly until the release latches click into place.
3. Reconnect the hard disk drive bracket and cable assembly cables.
4. Install the hard disk drives, if you previously removed any from the storage enclosure (see “Installing a 3.5-inch simple-swap hard disk drive” on page 104).
5. Install the storage enclosure (see “Installing a storage enclosure on a system-board tray” on page 100).
6. Install the system-board tray in the chassis (see “Installing the system-board tray in a 2U chassis” on page 98).

Removing the 2U chassis power supply

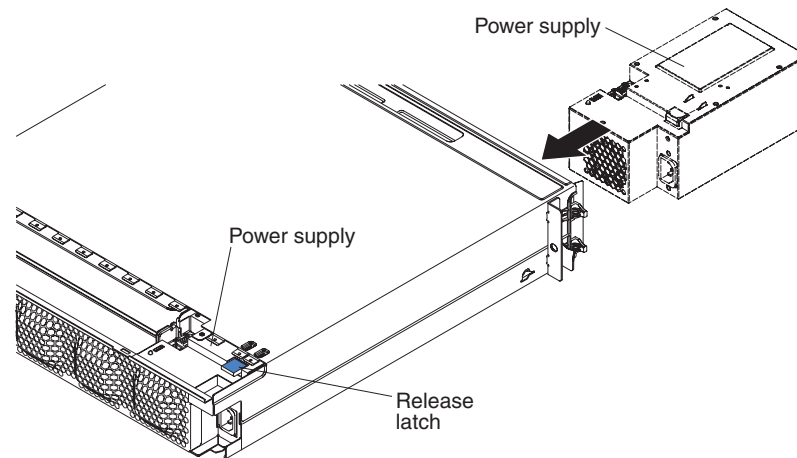
To remove the power supply from a 2U flex chassis, complete the following steps.



1. Read the safety information that begins on page vii and “Installation guidelines” on page 95.
2. If the chassis that contains the power supply is installed in a rack, remove it (see “Removing the 2U chassis from a Type 7825 rack” on page 129).
3. Remove any installed system-board trays (see “Removing the system-board tray from a 2U chassis” on page 97).
4. Remove the top cover (see “Removing the 2U chassis top cover” on page 108).
5. Remove the fan assembly (see “Removing the 2U chassis fan assembly” on page 110).
6. Press the power-supply release latch and push the power supply toward the front of the chassis.
7. Carefully pull the power supply out through the front of the chassis.
8. If you are instructed to return the power supply, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing the 2U chassis power supply

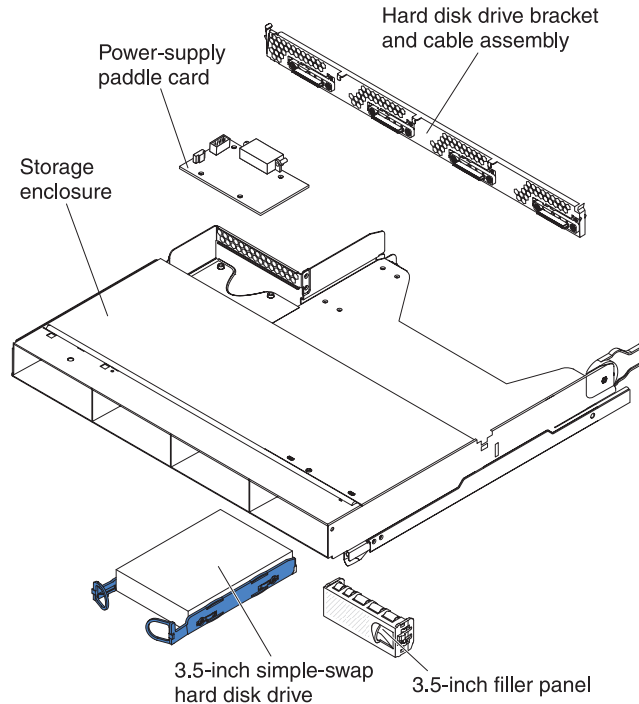
To install the power supply in a 2U flex chassis, complete the following steps.



1. Touch the static-protective package that contains the power supply to any unpainted metal surface on the outside of the chassis; then, remove the power supply from the package.
2. Insert the power supply into the front of the chassis.
3. Carefully guide the power supply into the guides at the left-rear corner of the chassis until the release latch clicks into place.
4. Install the fan assembly (see “Installing the 2U chassis fan assembly” on page 111).
5. Install the top cover (see “Installing the 2U chassis top cover” on page 109).
6. Install any system-board trays that you removed when you removed the chassis (see “Installing the system-board tray in a 2U chassis” on page 98).
7. Install the chassis in the rack (see “Installing the 2U chassis in a Type 7825 rack” on page 130).

Replacing a storage enclosure

To replace a damaged storage enclosure, complete the following steps.



1. Read the safety information that begins on page vii and “Installation guidelines” on page 95.
2. If the storage enclosure is installed on a system-board tray, remove it (see “Removing a storage enclosure from a system-board tray” on page 99).
3. Carefully set the storage enclosure on a flat, static-protective surface.
4. Remove the installed components in the following list from the storage enclosure; then, place them on a static-protective surface or install them in the new storage enclosure:
 - a. If hard disk drives are installed in the storage enclosure, make a note of where the hard disk drives are installed; then, remove them (see “Removing a 3.5-inch simple-swap hard disk drive” on page 103).
 - b. Remove the hard disk drive bracket and cable assembly (see “Removing a four-bay hard disk drive bracket and cable assembly” on page 124).
5. Install all of the components that you removed from the old storage enclosure in the new storage enclosure:
 - a. Install the hard disk drive bracket and cable assembly (see “Installing a four-bay hard disk drive bracket and cable assembly” on page 125).
 - b. Install the hard disk drives, if you removed any from the storage enclosure (see “Installing a 3.5-inch simple-swap hard disk drive” on page 104).
6. Install the storage enclosure on the system-board tray (see “Installing a storage enclosure on a system-board tray” on page 100).
7. Install the system-board tray in the chassis (see “Installing the system-board tray in a 2U chassis” on page 98).
8. If you are instructed to return the storage enclosure, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

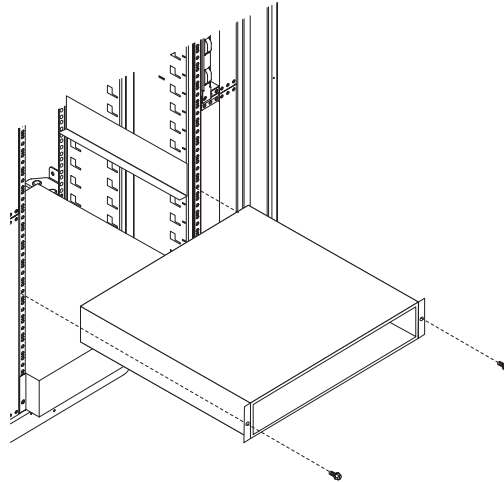
Removing and replacing FRUs

FRUs must be installed only by trained service technicians.

Note: The illustrations in this document might differ slightly from your hardware.

Removing the 2U chassis from a Type 7825 rack

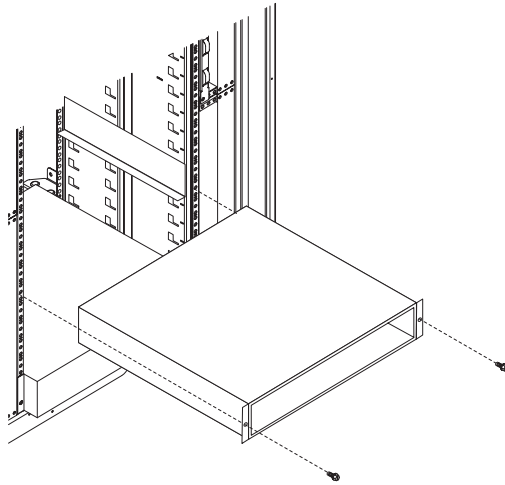
To remove the 2U flex chassis from a Type 7825 rack, complete the following steps.



1. Read the safety information that begins on page vii and “Installation guidelines” on page 95.
2. If the chassis contains a system-board tray that is operating, shut down the operating system; then, press the power-control button to turn off the system-board tray (see “Turning off the system-board tray” on page 9 for more information).
3. Remove any installed system-board trays (see “Removing the system-board tray from a 2U chassis” on page 97).
4. Remove the two screws that secure the chassis to the rack; then, pull the chassis forward, lift the chassis out of the rack, and set it on a flat, static-protective surface.
5. If you are replacing a damaged chassis, remove the fan assembly and power supply from the chassis, and place them on a static-protective surface or install them in the new chassis (see “Removing the 2U chassis fan assembly” on page 110 and “Removing the 2U chassis power supply” on page 126).
6. If you are instructed to return the chassis, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing the 2U chassis in a Type 7825 rack

To install the 2U flex chassis in a Type 7825 rack, complete the following steps.



1. If you are installing a new chassis, install the power supply and fan assembly that were removed from the old chassis (see “Installing the 2U chassis power supply” on page 127 and “Installing the 2U chassis fan assembly” on page 111).
2. Install the chassis on the rails; then, install the two screws to secure the chassis to the rack.
3. Install any system-board trays that you removed when you removed the chassis (see “Installing the system-board tray in a 2U chassis” on page 98).

Removing a microprocessor and heat sink

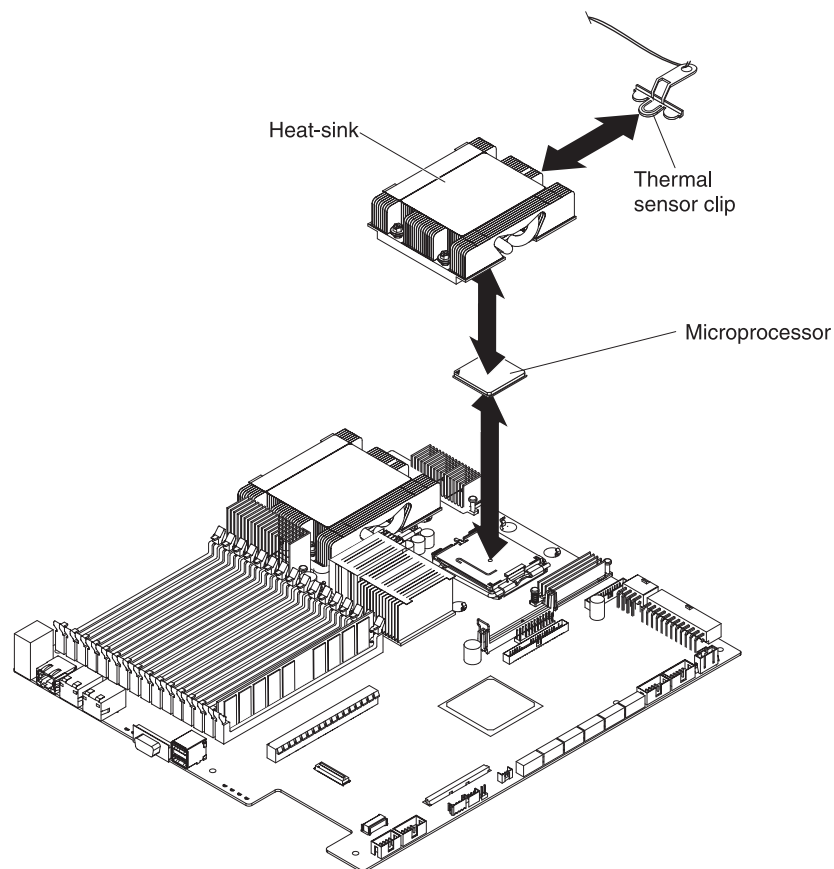
Read the following important guidelines before you remove a microprocessor that is not faulty (for example, when you are replacing the system-board assembly).

If you are not replacing a defective heat sink or microprocessor, the thermal grease on the heat sink and microprocessor will remain effective if you observe the following precautions:

- Carefully handle the heat sink and microprocessor when you remove or install these components.
- Do not touch the thermal grease or otherwise allow it to become contaminated.

Notes:

- The heat-sink FRU is packaged with the thermal grease applied to the underside.
- You must replace the thermal grease if it becomes contaminated or has come in contact with another object other than its paired microprocessor.
- The heat sink and the thermal grease are available as separate FRUs.



To remove a microprocessor and heat sink, complete the following steps:

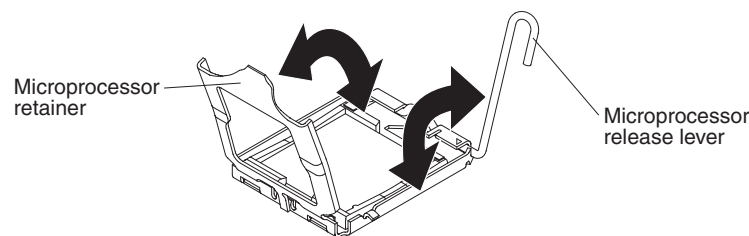
1. Read the safety information that begins on page vii and “Installation guidelines” on page 95.
2. If the system-board tray is installed in a chassis, remove it (see “Removing the system-board tray from a 2U chassis” on page 97).
3. If a storage enclosure is installed, remove it (see “Removing a storage enclosure from a system-board tray” on page 99); otherwise, remove the system-board tray cover (see “Removing the system-board tray cover” on page 101).

4. Remove the heat sink.

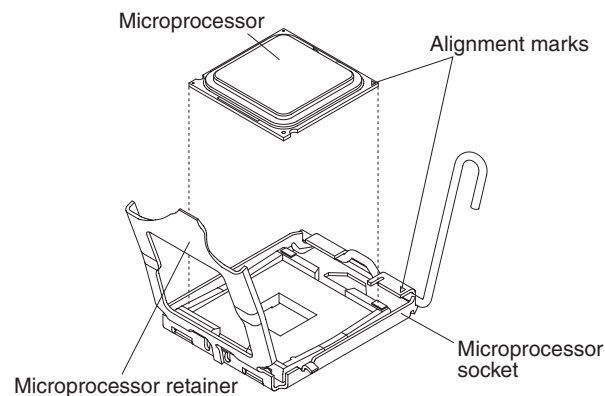
Attention: Do not touch the thermal grease on the bottom of the heat sink. Touching the thermal grease will contaminate it. If the thermal grease on the microprocessor or heat sink becomes contaminated, you must replace it. See “Thermal grease” on page 135 for more information.

- a. Loosen the screw on one side of the heat sink to break the seal with the microprocessor.
- b. Press firmly on the captive screws and loosen them with a screwdriver.
- c. Use your fingers to gently pull the heat sink off the microprocessor.
- d. Pull the thermal sensor clip off the heat sink; then, place the heat sink upside down on a clean, flat surface.

Attention: Do not use any tools or sharp objects to lift the release lever on the microprocessor socket. Doing so might result in permanent damage to the system board.

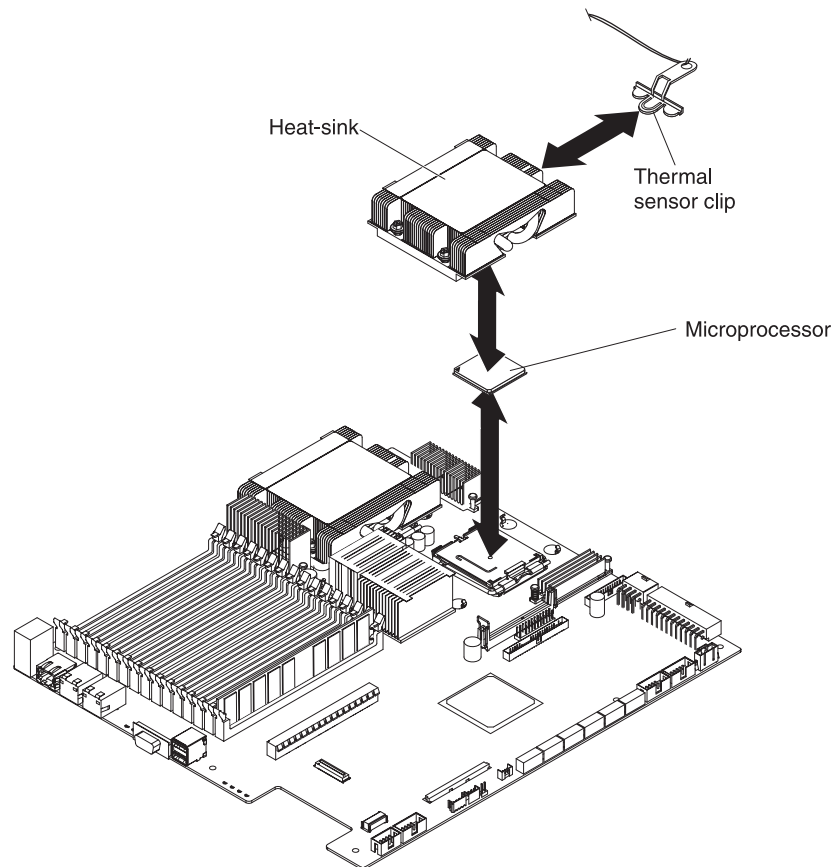


5. Rotate the locking lever on the microprocessor socket from its closed and locked position until it stops in the fully open position (approximately a 135° angle). Lift the microprocessor retainer cover upward.
6. Use your fingers to pull the microprocessor out of the socket.



7. If you are instructed to return the microprocessor and heat sink, follow all packaging instructions and use any packaging materials for shipping that are supplied to you.

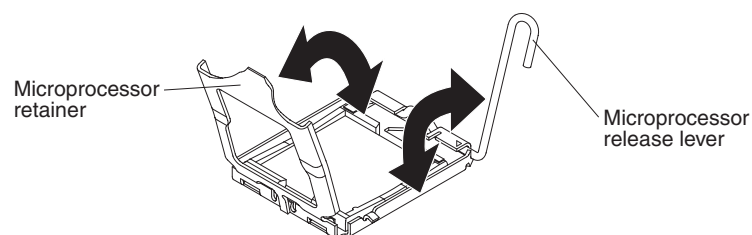
Installing a microprocessor and heat sink



To install a microprocessor and heat sink, complete the following steps:

1. Install the microprocessor:

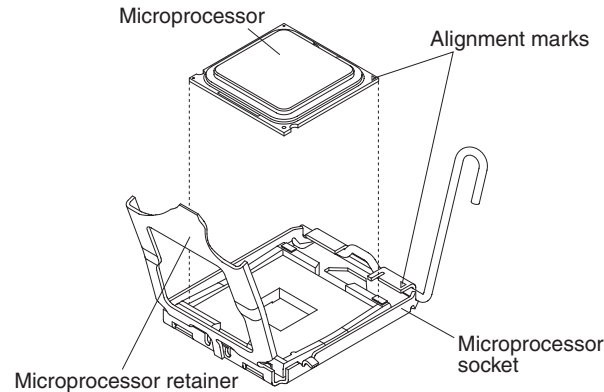
Attention: Do not use any tools or sharp objects to lift the locking lever on the microprocessor socket. Doing so might result in permanent damage to the system board.



- Rotate the locking lever on the microprocessor socket from its closed and locked position until it stops in the fully open position (approximately a 135° angle), as shown.
- Rotate the microprocessor retainer on the microprocessor socket from its closed position until it stops in the fully open position (approximately a 135° angle), as shown.
- Touch the static-protective package that contains the microprocessor to any *unpainted* metal surface on the system-board tray; then, remove the microprocessor from the package.

Attention: Handle the microprocessor only by its edges. Do not touch the contacts on the bottom of the microprocessor or in the microprocessor socket. Touching these contacts might result in permanent damage to the system board.

- d. Remove the cover from the bottom of the microprocessor.



- e. Center the microprocessor over the microprocessor socket. Align the triangle on the corner of the microprocessor with the triangle on the corner of the socket and carefully place the microprocessor into the socket.

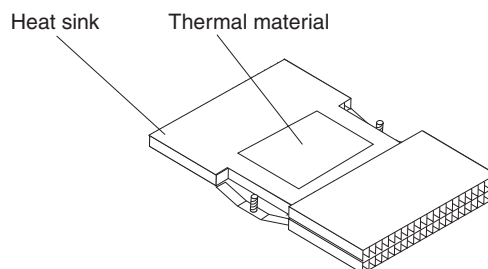
Attention:

- Do not press the microprocessor into the socket.
 - Make sure that the microprocessor is oriented and aligned correctly in the socket before you try to close the microprocessor retainer.
- f. Carefully close the microprocessor retainer.
- g. Rotate the locking lever on the microprocessor socket to the closed and locked position. Make sure that the lever is secured in the locked position by the tab on the microprocessor socket.

2. Install a heat sink on the microprocessor.

Attention:

- Do not set down the heat sink after you remove the plastic cover.
- Do not touch the thermal grease on the bottom of the heat sink. Touching the thermal grease will contaminate it.
- If the thermal grease on the microprocessor or heat sink becomes contaminated, you must replace it. See “Thermal grease” on page 135 for instructions.



- a. If you are installing a new heat sink, remove the plastic protective cover from the bottom of the heat sink.
- b. Install the thermal sensor clip on the back of the heat sink.
- c. Make sure that the thermal grease is still on the bottom of the heat sink; then, align and place the heat sink on top of the microprocessor in the retention bracket, thermal grease side down. Press firmly on the heat sink.

- d. Align the four screws on the heat sink with the holes on the system-board tray.
 - e. Press firmly on the captive screws and tighten them with a screwdriver, alternating among the screws until they are tight. If possible, each screw should be rotated two full rotations at a time. Repeat until the screws are tight. Do not overtighten the screws by using excessive force. If you are using a torque wrench, tighten the screws to 8.5 to 13 Newton-meters (Nm) (6.3 to 9.6 inch-pounds).
3. Install the storage enclosure, if you removed one when you removed the microprocessor and heat sink (see “Installing a storage enclosure on a system-board tray” on page 100); otherwise, install the system-board tray cover (see “Installing the system-board tray cover” on page 102).
 4. Install the system-board tray in the chassis (see “Installing the system-board tray in a 2U chassis” on page 98).

Thermal grease

You must replace the thermal grease whenever the heat sink has been removed from the top of the microprocessor and is going to be reused on another microprocessor or when debris is found in the grease.

When you are installing the heat sink on the same microprocessor that you removed it from, make sure that the thermal grease on the heat sink and microprocessor is not contaminated. Never add thermal grease the existing thermal grease on the heat sink and microprocessor.

Notes:

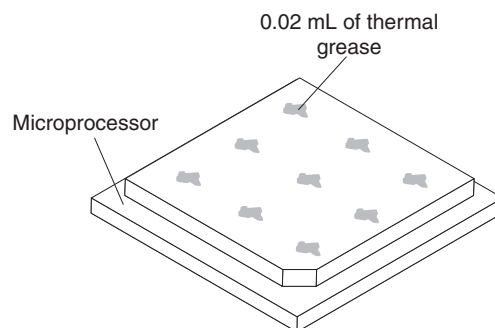
1. Read the safety information that begins on page vii.
2. Read the “Installation guidelines” on page 95.
3. Read “Handling static-sensitive devices” on page 96.

To replace damaged or contaminated thermal grease on the microprocessor and heat sink, complete the following steps:

1. Place the heat sink on a clean work surface.
2. Remove the cleaning pad from its package and unfold it completely.
3. Use the cleaning pad to wipe the thermal grease from the bottom of the heat sink.

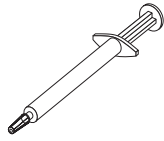
Note: Make sure that all of the thermal grease is removed.

4. Use a clean area of the cleaning pad to wipe the thermal grease from the microprocessor; then, dispose of the cleaning pad after all of the thermal grease is removed.



5. Use the thermal-grease syringe to place 9 uniformly spaced dots of 0.02 mL each on the top of the microprocessor. The outermost dots must be within

approximately 5 mm of the edge of the microprocessor, to ensure uniform distribution of the grease.

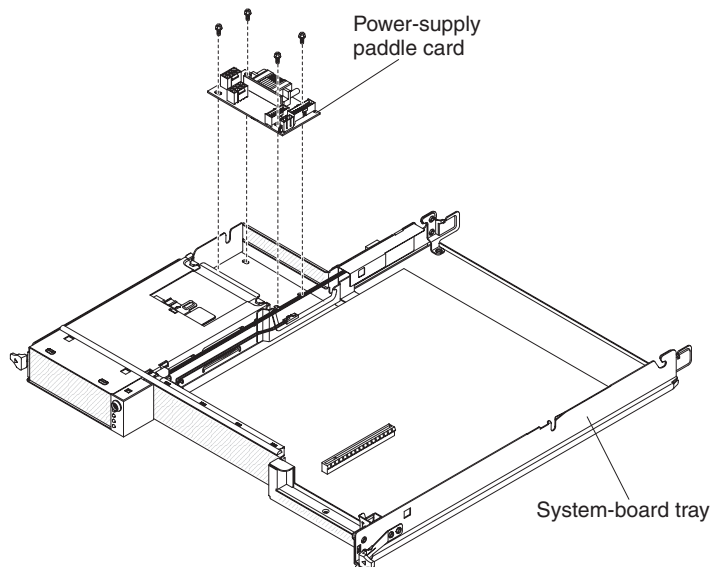


Note: If the grease is properly applied, approximately half of the grease will remain in the syringe.

6. Install the heat sink onto the microprocessor as described in “Installing a microprocessor and heat sink” on page 133.

Removing a power-supply paddle card from the system-board tray

To remove a power-supply paddle card from the system-board tray, complete the following steps.

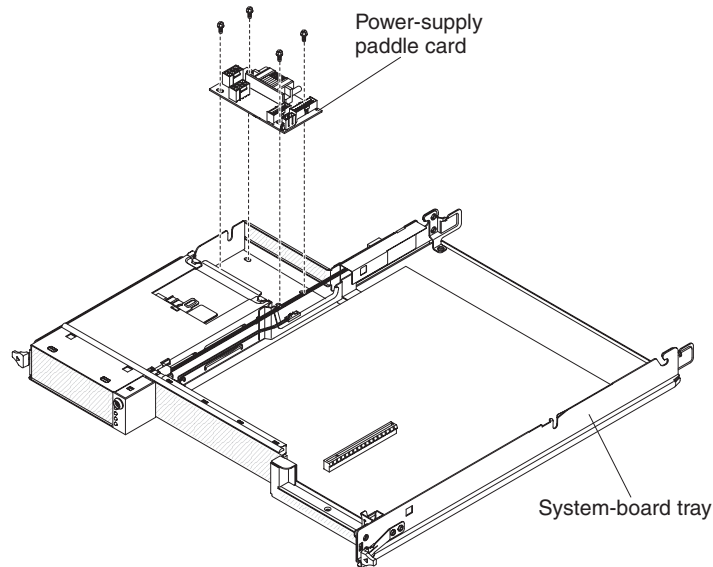


1. Read the safety information that begins on page vii and “Installation guidelines” on page 95.
2. If the system-board tray is installed in a chassis, remove it (see “Removing the system-board tray from a 2U chassis” on page 97).
3. Carefully set the system-board tray on a flat, static-protective surface.
4. Remove the storage enclosure, if one is installed, and set it on a flat, static-protective surface (see “Removing a storage enclosure from a system-board tray” on page 99); otherwise, remove the system-board tray cover (see “Removing the system-board tray cover” on page 101).
5. If a 3.5-inch simple-swap hard disk drive is installed in the system-board tray, complete the following steps:
 - a. Remove the 3.5-inch hard disk drive (see “Removing a 3.5-inch simple-swap hard disk drive” on page 103).
 - b. Remove the hard disk drive bracket and cable assembly (see “Removing a one-bay hard disk drive bracket and cable assembly” on page 122).
6. Make a note of where cables are attached to the power-supply paddle card; then, disconnect them.

7. Remove the four screws that secure the power-supply paddle card to the system-board tray and save them for future use.
8. Lift the power-supply paddle card out of the system-board tray.
9. If you are instructed to return the power-supply paddle card, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing a power-supply paddle card in the system-board tray

To install a power-supply paddle card in the system-board tray, complete the following steps.



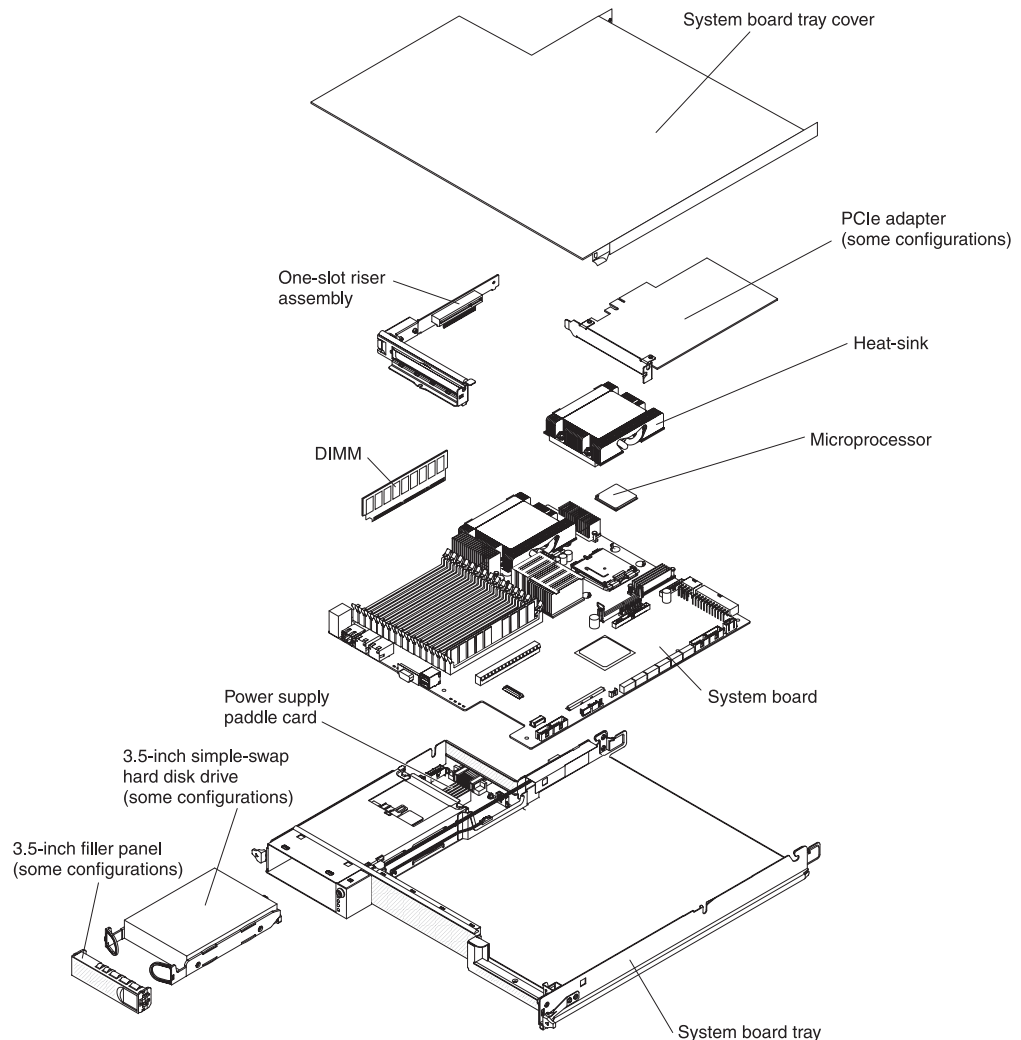
1. Touch the static-protective package that contains the power-supply paddle card to any unpainted metal surface on the outside of the system-board tray; then, remove the power-supply paddle card from the package.
2. Place the power-supply paddle card on the mounting studs in the system-board tray and install the four retaining screws.
3. Reconnect the power-supply paddle card cables.
4. Install the 3.5-inch simple-swap drive, if you removed one when you removed the power-supply paddle card:
 - a. Install the hard disk drive bracket and cable assembly (see “Installing a one-bay hard disk drive bracket and cable assembly” on page 123).
 - b. Install the 3.5-inch hard disk drive (see “Installing a 3.5-inch simple-swap hard disk drive” on page 104).
5. Install the storage enclosure, if you removed one when you removed the power-supply paddle card (see “Installing a storage enclosure on a system-board tray” on page 100); otherwise, install the system-board tray cover (see “Installing the system-board tray cover” on page 102).
6. Install the system-board tray in the chassis (see “Installing the system-board tray in a 2U chassis” on page 98).

Removing the system-board tray

After replacement, you must either update the system-board tray with the latest firmware or restore the pre-existing firmware from a diskette or CD image.

Note: See “System-board layouts” on page 10 for the locations of the connectors on the system board.

To remove the system-board tray, complete the following steps.

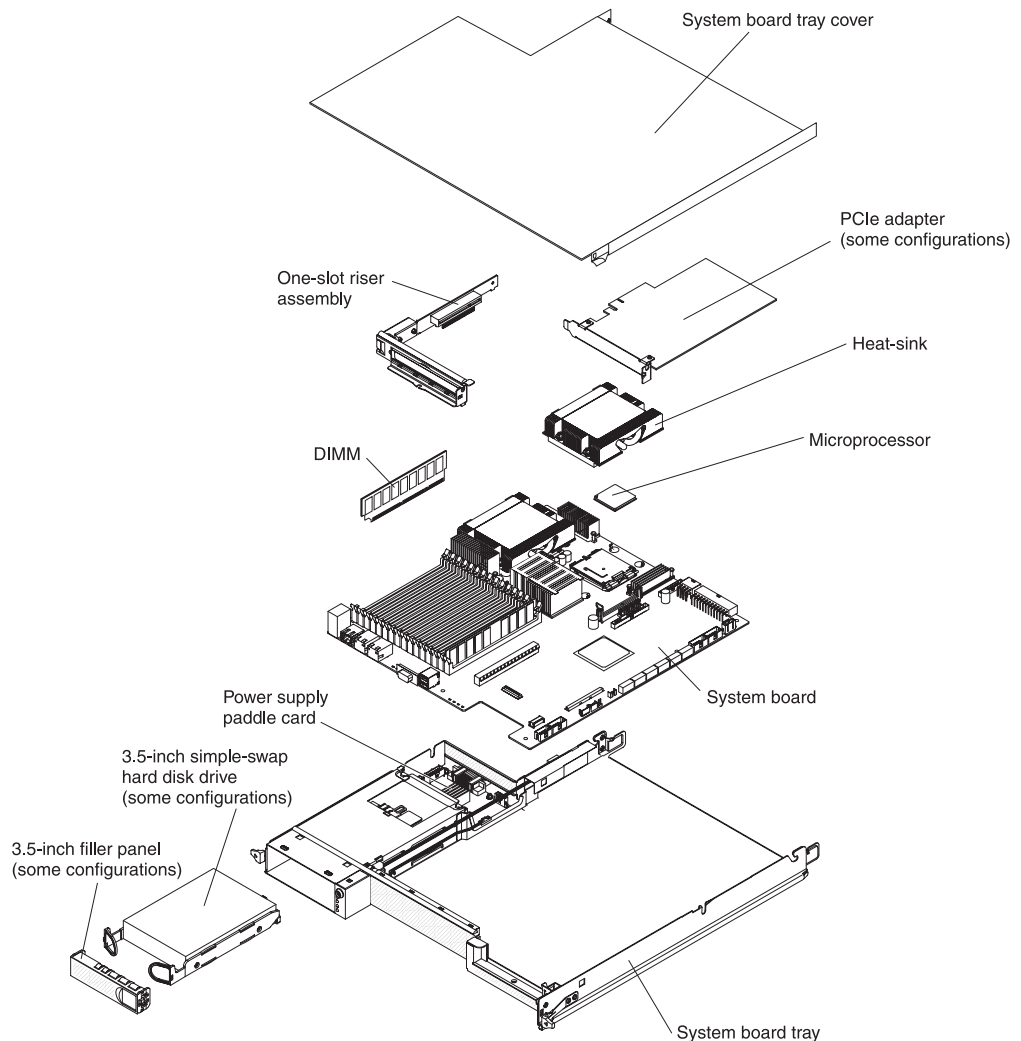


1. Read the safety information that begins on page vii and “Installation guidelines” on page 95.
2. If the system-board tray is installed in a chassis, remove it (see “Removing the system-board tray from a 2U chassis” on page 97).
3. If a storage enclosure is installed, remove it (see “Removing a storage enclosure from a system-board tray” on page 99); otherwise, remove the system-board tray cover (see “Removing the system-board tray cover” on page 101).
4. Remove the hard disk drives, if any are installed (see “Removing a 3.5-inch simple-swap hard disk drive” on page 103).
5. Remove the hard disk drive bracket and cable assembly (see “Removing and installing a hard disk drive bracket and cable assembly” on page 122).

6. Remove the PCIe adapter, if one is installed (see “Removing an adapter” on page 113).
7. Remove the riser card (see “Removing a PCIe riser-card assembly” on page 116).
8. Remove the battery from the system board (see “Removing the battery” on page 118).
9. Remove the DIMMs (see “Removing a memory module” on page 105).
10. Remove the microprocessors and heat sinks (see “Removing a microprocessor and heat sink” on page 131).
11. If you are instructed to return the system-board tray, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing the system-board tray

To install a system-board tray, complete the following steps.



Note: You might have to remove component fillers or covers before you can install some components.

1. Reinstall the microprocessors and heat sinks (see “Installing a microprocessor and heat sink” on page 133).

2. Reinstall the DIMMs (see “Installing a memory module” on page 106).
3. Reinstall the battery (see “Installing the battery” on page 118).
4. Reinstall the riser card (see “Installing a PCIe riser-card assembly” on page 117).
5. Reinstall the PCIe adapter, if you removed one (see “Installing an adapter” on page 114).
6. Install the hard disk drive bracket and cable assembly (see “Removing and installing a hard disk drive bracket and cable assembly” on page 122).
7. Reinstall the hard disk drives, if you removed any (See “Installing a 3.5-inch simple-swap hard disk drive” on page 104).
8. Install the storage enclosure, if you removed one (see “Installing a storage enclosure on a system-board tray” on page 100); otherwise, install the system-board tray cover (see “Installing the system-board tray cover” on page 102).
9. Install the system-board tray in the chassis (see “Installing the system-board tray in a 2U chassis” on page 98).
10. Locate the two-digit, alphanumeric thermal-profile code. The two-digit code is printed on the thermal-profile label that is affixed to the top of the original system-board tray.
11. Locate the replacement identification (RID) tag that is affixed to the top of the new system-board tray and record the machine type (MT), serial number (SN), and thermal-profile code on the tag.
12. Refer to Retain Tip **H193629** for the instructions to program the thermal profile for the new system board.

Chapter 6. Configuration information and instructions

This section provides information about updating the firmware and using the configuration utilities.

To update the firmware, you might have to use an external USB CD-RW/DVD drive. To run the BIOS Setup Utility or the Dynamic System Analysis (DSA) Preboot diagnostic programs, you must have the following additional hardware:

- Monitor
- Combination USB keyboard and pointing device such as IBM part number 40K5372
- External USB CD-RW/DVD drive such as the IBM and Lenovo part number 73P4515 or 73P4516

The following configuration programs come with the dx360 server:

- **BIOS Setup Utility program**

The BIOS Setup Utility program is part of the basic input/output system (BIOS). Use it to configure serial port assignments, change interrupt request (IRQ) settings, change the startup-device sequence, set the date and time, and set passwords. For information about using this program, see “Using the BIOS Setup Utility program.”

- **Boot Manager program**

The Boot Manager program is part of the BIOS. Use it to override the startup sequence that is set in the BIOS Setup Utility program and temporarily assign a device to be first in the startup sequence. For information about using this program, see “Using the Boot Manager” on page 144.

- **Gigabit Ethernet controller configuration**

To configure the integrated Gigabit Ethernet controller, see “Configuring the Gigabit Ethernet controller” on page 144.

- **IBM Dynamic System Analysis (DSA) Preboot Diagnostic Programs**

The IBM Dynamic System Analysis (DSA) Preboot diagnostic programs are the primary method of testing the major components of an IBM System x iDataPlex server. You can use the USB memory key that comes with the iDataPlex rack when you run the DSA Preboot diagnostic programs on an iDataPlex server.

To download the most current USB or ISO image of the DSA Preboot diagnostic programs go to <http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA>.

For additional information about the DSA diagnostic programs, see “Diagnostic programs, messages, and error codes” on page 63.

Using the BIOS Setup Utility program

Use the BIOS Setup Utility program to perform the following tasks:

- View configuration information
- View and change assignments for devices and I/O ports
- Set the date and time
- Set and change passwords
- Set the startup characteristics and the order of startup devices
- Set and change settings for advanced hardware features
- View the POST error log

- Change interrupt request (IRQ) settings

Starting the BIOS Setup Utility program

To start the BIOS Setup Utility program, complete the following steps:

1. Turn on the server. If the server is already on when you start this procedure, you must shut down the operating system, turn off the server, wait a few seconds until all in-use LEDs are turned off, and restart the server.
2. When the message Press F2 to enter Setup is displayed, press F2. (This prompt is displayed on the screen for only a few seconds. You must press F2 quickly.) If you have set both a user password and an administrator password, you must type the administrator password to access the full BIOS Setup Utility menu. If you do not type the administrator password, a limited BIOS Setup Utility menu is available.

Note: If a serious error is detected during start up, the server will automatically enter setup and display the Error Manager screen. If the CMOS/NVRAM has been corrupted, you will not see the F2 prompt, instead, you will see the following message prompts:

Warning: CMOS checksum invalid

Warning: CMOS time and date not set

Information on clearing the CMOS is provided in “Clearing CMOS memory” on page 81.

3. Select settings to view or change.

BIOS Setup Utility menu choices

Note: Some options in the BIOS configuration menus might not be supported in all server configurations.

The following choices are on the BIOS Setup Utility menu at the top of the screen. Depending on the version of the BIOS code, some menu choices might differ slightly from these descriptions. Depending on how passwords are configured, certain BIOS Setup Utility fields might not be editable by all users. See “Passwords” on page 143 for additional information.

- **Advanced**

Select this choice to view and change configuration information for the server options.

- **Processor Configuration**

Select this choice to view the processor information, including the type, speed, and cache size of the microprocessor.

- **Memory Configuration**

Select this choice to view or change information about the memory that is installed in the server.

- **ATA Controller Configuration**

Select this choice to view details about the hard disk drives that are installed in the server. Use this option also to enable, disable, or configure hard disk drives.

- **Mass Storage Controller Configuration**

This feature is not available on the dx360 server.

- **Serial Port Configuration**

- Select this choice to set up serial port A and serial port B.
- **USB Configuration**
 - Select this choice to enable or disable USB support.
- **PCI Configuration**
 - Select this choice to view or change the settings for the PCI Express card, the onboard Ethernet controller, or video information.
- **System Acoustic and Performance Configuration**
 - Select this choice to view or change the server thermal information.
- **Security**
 - Select this choice to set passwords and other security options. The server supports two password levels:
 - **Administrator Password**
 - Select this choice to set or change an administrator password. An administrator password is intended to be used by a system administrator; it limits access to the full BIOS Setup Utility menu. If an administrator password is set, the full BIOS Setup Utility menu is available only if you type the administrator password at the password prompt.
 - **User Password**
 - Select this choice to set, change, or delete a user password.
 - For more information about passwords, see “Passwords.”
- **Server Management**
 - Select this choice to view information about the server and to configure Console Redirection information. When you make changes through other choices in the BIOS Setup Utility program, some of those changes are reflected in the System Information.
- **Boot Options**
 - Select this choice to view boot devices during POST or to change the order in which you want to boot the devices.
- **Boot Manager**
 - Select this choice to view a list of available boot devices or to select which device to boot. You also can use this option to launch the EFI Shell.
- **Error Manager**
 - Select this choice to view any errors that were encountered during POST.
- **Exit Setup**
 - Select this choice to save your changes and exit from the BIOS Setup Utility program. This choice also provides you with options to restore the server to the factory default values or to restore a set of default values that you define.

Passwords

From the **Security** choice, you can set or change a user password and an administrator password. Depending on how passwords are configured, certain BIOS Setup Utility fields might not be editable by all users.

Administrator password

If you set only an administrator password, you must type the administrator password to access all editable fields in the BIOS Setup Utility program. If an administrator password is set, you also can set a user password. You can use any combination of up to seven characters (A - Z, a - z, and 0 - 9) for the administrator and user passwords.

If you forget the administrator password, you can clear the password by using the Password Clear jumper.

User password

If you set an administrator password for a system administrator and a user password for a user, a system administrator who types the administrator password has access to change all editable BIOS Setup Utility fields. A user who types the user password can view all BIOS Setup Utility fields but can change values in a subset of those fields that are editable by the system administrator. You can use any combination of up to seven characters (A - Z, a - z, and 0 - 9) for the user password.

If you forget the user password, you can regain access to the server in any of the following ways:

- If an administrator password is set, type the administrator password at the password prompt. Start the BIOS Setup Utility program and reset the user password.
- Clear the password by using the password clear jumper (see “Clearing passwords” on page 81 for instructions).

Using the Boot Manager

The Boot Manager is a part of the BIOS Configuration Utility program that you can use to temporarily redefine the first startup device without changing settings in the BIOS Configuration Utility.

To use the Boot Manager, complete the following steps:

1. Turn off the system-board tray.
2. Restart the system-board tray.
3. Press F2.
4. Select **Boot Manager**.
5. Select the startup device and press Enter to boot from the selected device.

The next time the system-board tray is started, it returns to the startup sequence that is set in the BIOS Configuration Utility program.

Configuring the Gigabit Ethernet controller

The Ethernet controller is integrated on the system board. It provides an interface for connecting to a 10 Mbps, 100 Mbps, or 1 Gbps network and provides full duplex (FDX) capability, which enables simultaneous transmission and reception of data on the network. If the Ethernet port in the server supports auto-negotiation, the controller detects the data-transfer rate (10BASE-T, 100BASE-TX, or 1000BASE-T) and duplex mode (full-duplex or half-duplex) of the network and automatically operates at that rate and mode.

You do not have to set any jumpers or configure the controller. However, you must install a device driver to enable the operating system to address the controller.

Notes:

1. Changes are made periodically to the IBM Web site. The actual procedure might vary slightly from what is described in this document.

2. To install the device driver for the Ethernet controller, you might need to use an external USB CD-RW/DVD drive such as the IBM and Lenovo part number 73P4515 or 73P4516.

To find updated information about configuring the controller, complete the following steps:

1. Go to <http://www.ibm.com/systems/support/>.
2. Under **Product support**, click **System x**.
3. Under **Popular links**, click **Publications lookup**.
4. From the **Product family** menu, select **System x iDataPlex dx360 server** and click **Go**.

Note: The BIOS Setup Utility provides an option in **Advanced** → **PCI Configuration** → **Onboard NIC ROM** to enable or disable the preboot execution environment function. Disabling **Onboard NIC ROM** does not disable the Wake On LAN function. See “Using the BIOS Setup Utility program” on page 141 for more information.

Firmware updates

The firmware for the server is periodically updated and is available for download on the Web. Go to <http://www.ibm.com/systems/support/> to check for the latest level of firmware, such as BIOS code, vital product data (VPD) code, and device drivers. Download the latest firmware for the server; then, install the firmware, using the instructions that are included with the downloaded files.

When you replace a device in the server, you might have to either update the server with the latest version of the firmware that is stored in memory on the device or restore the pre-existing firmware.

The following firmware updates are downloadable from the Web at <http://www.ibm.com/systems/support/>. Follow the instructions on how to apply the updates using documentation that is included in the downloaded files:

- BIOS code
- BMC firmware
- FRU/SDR data

Major components contain VPD code. You can select to update the VPD code when you update the BIOS code.

To download the firmware for the server, go to:

1. <http://www.ibm.com/systems/support/>.
2. Under **Product support**, click **System x**.
3. Under **Popular links**, click **Software and device drivers**.
4. Click **System x iDataPlex dx360 server** to display the matrix of downloadable files for the server.

For additional information about tools for updating, managing, and deploying firmware, see the System x and xSeries Tools Center at <http://publib.boulder.ibm.com/infocenter/toolsctr/v1r0/index.jsp>.

Setting the BMC IP parameters

When the iDataPlex dx360 server is turned on, you can access the BIOS Setup Utility menu by pressing function key F2. With the iDataPlex dx360 server, you might not be able to display or change the IP parameters for the Baseboard Management Controller (BMC) using the BIOS Setup Utility.

This symptom occurs when the dx360 server is configured with one of the following operating systems:

- Red Hat Enterprise Linux 5, any update
- SUSE Linux Enterprise Server 10, any service pack

This section provides work-around procedures for systems that do not allow you to display or change the BMC IP parameters via the BIOS Setup Utility. The procedure depends on the operating system being used.

Systems configured with Red Hat Linux

To set BMC IP parameters for systems configured with Red Hat Enterprise Linux 5, complete the following steps:

1. Attach a keyboard, mouse, and monitor to the dx360 server for which you want to display or modify the BMC IP parameters.
2. Turn on the dx360 server and allow it boot to the Red Hat operating system.
3. On the desktop in the upper left hand corner of the screen, select **Applications --> Accessories --> Terminal --> Enter**. This opens up a new window on the desktop and starts a terminal session with the Red Hat operating system.
4. Type the following commands to display the entire set of IP parameters for the baseboard management controller:
 - `modprobe ipmi_si` and press Enter
 - `modprobe ipmi_devintf` and press Enter
 - `modprobe lan print 1` and press Enter
5. Search for the IP Address line. This indicates the IP address of the baseboard management controller.
6. To change the baseboard management controller IP address for Linux Red Hat, type `ipmitool lan set 1 ipscr static` and press Enter. This sets the IP address source as entered by the user.

Note: Changing the BMC IP address might cause network issues. Contact the IT administrator before attempting to change any network settings.

7. Type `ipmitool lan set 1 ipaddr IP address` and press Enter, where *IP address* is the desired baseboard management controller IP address.
8. To change the IP address network mask, type `ipmitool lan set 1 netmask net mask` and press Enter, where *net mask* is the desired network IP mask.
9. To change the IP address gateway, type `ipmitool lan set 1 defgw IP address` and press Enter, where *IP address* is the desired gateway IP address.
10. Type the following commands to verify that the changes were made correctly:
 - `modprobe ipmi_si` and press Enter
 - `modprobe ipmi_devintf` and press Enter
 - `modprobe lan print 1` and press Enter
11. Click the **X** in the right corner of the terminal window to close the window.

Systems configured with SUSE Linux

To set BMC IP parameters for systems configured with SUSE Linux Enterprise Server 10, complete the following steps:

1. Attach a keyboard, mouse, and monitor to the dx360 server for which you want to display or modify the BMC IP parameters.
2. Turn on the dx360 server and allow it boot to the Linux operating system.
3. On a blank place on the desktop, click the left mouse button and select **Applications --> Gnome Terminal --> Enter**. This opens up a new window on the desktop and starts a terminal session with the Linux SUSE operating system.
4. Type the following commands to display the entire set of IP parameters for the baseboard management controller:
 - `modprobe ipmi_si` and press Enter
 - `modprobe ipmi_devintf` and press Enter
 - `modprobe lan print 1` and press Enter
5. Search for the IP Address line. This indicates the IP address of the baseboard management controller.
6. Search for the IP Source line. This indicates if the IP address is set by dynamic host controller protocol (DHCP) or is set statically by the user.
7. To change the baseboard management controller IP address for SUSE Linux, type `ipmitool lan set 1 ipscr static` and press Enter. This sets the IP address source as entered by the user.

Note: Changing the BMC IP address might cause network issues. Contact the IT administrator before attempting to change any network settings.

8. Type `ipmitool lan set 1 ipaddr IP address` and press Enter, where *IP address* is the desired baseboard management controller IP address.
9. To change the IP address network mask, type `ipmitool lan set 1 netmask net mask` and press Enter, where *net mask* is the desired network IP mask.
10. To change the IP address gateway, type `ipmitool lan set 1 defgw IP address` and press Enter, where *IP address* is the desired gateway IP address.
11. Type the following commands to verify that the changes were made correctly:
 - `modprobe ipmi_si` and press Enter
 - `modprobe ipmi_devintf` and press Enter
 - `modprobe lan print 1` and press Enter
12. Click the **X** in the right corner of the Gnome terminal window to close the window.

Appendix A. Getting help and technical assistance

If you need help, service, or technical assistance or just want more information about IBM products, you will find a wide variety of sources available from IBM to assist you. This appendix contains information about where to go for additional information about IBM and IBM products, what to do if you experience a problem with your product or optional device, and whom to call for service, if it is necessary.

Before you call

Before you call, make sure that you have taken these steps to try to solve the problem yourself:

- Check all cables to make sure that they are connected.
- Check the power switches to make sure that the system and any optional devices are turned on.
- Use the troubleshooting information in your system documentation, and use the diagnostic tools that come with your system. Information about diagnostic tools is in the *Problem Determination and Service Guide* on the *IBM Documentation CD* that comes with your system.
- Go to the IBM support Web site at <http://www.ibm.com/systems/support/> to check for technical information, hints, tips, and new device drivers or to submit a request for information.

You can solve many problems without outside assistance by following the troubleshooting procedures that IBM provides in the online help or in the documentation that is provided with your IBM product. The documentation that comes with IBM systems also describes the diagnostic tests that you can perform. Most systems, operating systems, and programs come with documentation that contains troubleshooting procedures and explanations of error messages and error codes. If you suspect a software problem, see the documentation for the software.

Using the documentation

Information about your IBM system and preinstalled software, if any, or optional device is available in the documentation that comes with the product. That documentation can include printed documents, online documents, readme files, and help files. See the troubleshooting information in your system documentation for instructions for using the diagnostic programs. The troubleshooting information or the diagnostic programs might tell you that you need additional or updated device drivers or other software. IBM maintains pages on the World Wide Web where you can get the latest technical information and download device drivers and updates. To access these pages, go to <http://www.ibm.com/systems/support/> and follow the instructions. Also, some documents are available through the IBM Publications Center at <http://www.ibm.com/shop/publications/order/>.

Getting help and information from the World Wide Web

On the World Wide Web, the IBM Web site has up-to-date information about IBM systems, optional devices, services, and support. The address for IBM System x[®] and xSeries[®] information is <http://www.ibm.com/systems/x/>.

The address for IBM iDataPlex information is <http://www.ibm.com/systems/x/hardware/idadaplex/index.html>. The address for IBM BladeCenter[®] information is <http://www.ibm.com/systems/bladecenter/>.

You can find service information for IBM systems and optional devices at <http://www.ibm.com/systems/support/>.

Software service and support

Through IBM Support Line, you can get telephone assistance, for a fee, with usage, configuration, and software problems with System x and xSeries servers, BladeCenter products, IntelliStation workstations, and appliances. For information about which products are supported by Support Line in your country or region, see <http://www.ibm.com/services/sl/products/>.

For more information about Support Line and other IBM services, see <http://www.ibm.com/services/>, or see <http://www.ibm.com/planetwide/> for support telephone numbers. In the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378).

Hardware service and support

You can receive hardware service through your IBM reseller or IBM Services. To locate a reseller authorized by IBM to provide warranty service, go to <http://www.ibm.com/partnerworld/> and click **Find a Business Partner** on the right side of the page. For IBM support telephone numbers, see <http://www.ibm.com/planetwide/>. In the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378).

In the U.S. and Canada, hardware service and support is available 24 hours a day, 7 days a week. In the U.K., these services are available Monday through Friday, from 9 a.m. to 6 p.m.

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台灣國際商業機器股份有限公司
台北市松仁路 7 號 3 樓
電話：0800-016-888

IBM Taiwan product service contact information:
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Taipei, Taiwan
Telephone: 0800-016-888

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Processor speed indicates the internal clock speed of the microprocessor; other factors also affect application performance.

CD or DVD drive speed is the variable read rate. Actual speeds vary and are often less than the possible maximum.

When referring to processor storage, real and virtual storage, or channel volume, KB stands for 1024 bytes, MB stands for 1 048 576 bytes, and GB stands for 1 073 741 824 bytes.

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Avis de conformité à la réglementation d'Industrie Canada

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Australia and New Zealand Class A statement

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United Kingdom telecommunications safety requirement

Notice to Customers

This apparatus is approved under approval number NS/G/1234/J/100003 for indirect connection to public telecommunication systems in the United Kingdom.

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This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to CISPR 22/European Standard EN 55022. The limits for Class A equipment were derived for commercial and industrial environments to provide reasonable protection against interference with licensed communication equipment.

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European Community contact:

IBM Technical Regulations
Pascalstr. 100, Stuttgart, Germany 70569
Telephone: 0049 (0)711 785 1176
Fax: 0049 (0)711 785 1283
E-mail: tjahn@de.ibm.com

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Part Number: 69Y3934

Printed in USA

(1P) P/N: 69Y3934

