Intel® Server System M50FCP1UR

System Integration and Service Guide

A guide providing instructions for the insertion and extraction of system components and available Intel accessories and spares

Rev. 1.3

September 2023

Delivering Breakthrough Data Center System Innovation–Experience What's Inside!
## Document Revision History

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Safety Warnings

**Heed safety instructions:** Before working with your server product, whether you are using this guide or any other resource as a reference, pay close attention to the safety instructions. You must adhere to the assembly instructions in this guide to ensure and maintain compliance with existing product certifications and approvals. Use only the described, regulated components specified in this guide. Use of other products/components will void the UL listing and other regulatory approvals of the product and will most likely result in noncompliance with product regulations in the region in which the product is sold.

**System power on/off:** The power button does not turn off the system AC power. To remove power from the system, you must unplug the AC power cord. Make sure that the AC power cord is unplugged before you open the chassis, add, or remove any components.

**Hazardous conditions, devices, and cables:** Hazardous electrical conditions may be present on power, telephone, and communication cables. Turn off the server and disconnect the power cord, telecommunications systems, networks, and modems attached to the server before opening it. Otherwise, personal injury or equipment damage can result.

**Installing or removing jumpers:** A jumper is a small plastic encased conductor that slips over two jumper pins. Some jumpers have a small tab on top that you can grip with your fingertips or with a pair of fine needle nosed pliers. If your jumpers do not have such a tab, take care when using needle nosed pliers to remove or install a jumper; grip the narrow sides of the jumper with the pliers, never the wide sides. Gripping the wide sides can damage the contacts inside the jumper, causing intermittent problems with the function controlled by that jumper. Take care to grip with, but not squeeze, the pliers or other tools you use to remove a jumper, or you may bend, or break the pins on the board.

**Electrostatic Discharge (ESD)**

Electrostatic discharge can damage the computer or the components within it. ESD can occur without the user feeling a shock while working inside the system chassis or while improperly handling electronic devices like processors, memory or other storage devices, and add-in cards.

![ESD Warning](image)

Intel recommends that the following steps be taken when performing any procedures described within this document or while performing service to any computer system.

- Where available, all system integration and/or service should be performed at a properly equipped ESD workstation
- Wear ESD protective gear like a grounded antistatic wrist strap, sole grounders, and/or conductive shoes
- Wear an anti-static smock or gown, to cover any clothing that may generate an electrostatic charge
- Remove all jewelry
- Disconnect all power cables and cords attached to the server before performing any integration or service
- Touch any unpainted metal surface of the chassis before performing any integration or service
- Hold all circuit boards and other electronic components by their edges only
- After removing electronic devices from the system, or from their protective packaging, place them component side up on to a grounded anti-static surface or conductive workbench pad. Do not place electronic devices on to the outside of any protective packaging.
Caution: Slide / Rail mounted equipment is not to be used as a shelf or a workspace.

Intel warranties that this product performs to its published specifications. However, all computer systems are inherently subject to unpredictable system behavior under various environmental and other conditions.

This product is not intended to be the sole source for any critical data, and the user must maintain a verified backup. Failure to do so, or to comply with other user notices in the product user guide and specification documents, may result in loss of or access to data.

Weight of the system:

- Due to the weight of a system, Intel recommends carrying the system with two people supporting the system from the sides or using a mechanical lift or a cart when moving the system from one location to another.
- If your system has rack handles installed, do not lift, or carry the system by the rack handles
- When lifting or moving a chassis, always grasp it by all four corners. Do not grasp the chassis by two points at opposing diagonal corners, doing so may damage the internal components.
- If you can only grasp the chassis at two different points, always grasp the chassis by the sides at the midpoint.
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1. Introduction

The Intel® Server System M50FCP1UR is a purpose-built, rack mount server that delivers power and performance in a 1U form factor. The system supports up to two 4th Gen Intel® Xeon® Scalable processors, delivering high core count and new hardware-enhanced security features. Previous generation Intel® Xeon® processor and Intel® Xeon® Scalable processor families are not supported.

The Intel® Server System M50FCP1UR supports up to 32 DDR5 DIMMs, providing high memory bandwidth for memory intensive workloads.

For details on all system features, refer to the Intel® Server System M50FCP1UR Technical Product Specification (TPS).

Figure 1. System Features Identification
About This Document

This document provides system integrators and service technicians with instructions for the installation and removal of system components. The document also covers available Intel accessories supported by this server system.

The document is organized into two sections. The first section (Chapters 24) is focused on the installation of system components and accessories into an L6 or L9 integrated server system.

The second section (Chapters 5, 6, and appendices A-G) is focused on system service. Theses chapters provide the service technician with valuable system information and procedures necessary to identify and replace a faulty system component.

System Integration

Chapter 2 – L6 System Integration–Essential System Components. Installation procedures for the following system components: processors, memory, and power supply. Removal and installation of the system top cover are covered.

Chapter 3 – L9 System Integration. Provides detailed instructions necessary to enhance system configurations by installing additional components and/or available accessory kits.

Chapter 4 – System Software Update and Configuration. A short overview describing the system software stack installed on new Intel servers and where to get the latest revisions.

System Service

Chapter 5 – System Service–System Features Overview. An overview that identifies and locates the features associated with the Intel® Server System M50FCP1U.

Chapter 6 – System Service and FRU Replacement. Installation procedures for system field replaceable units (FRUs).

Appendix A – Getting Help. Provides server system support and contact information.

Appendix B – Memory Population Rules. Provides a summary of memory population rules.

Appendix C – System Status LED Operating States and Definition. System status LED operating states and definition.

Appendix D – POST Code Diagnostic LED Decoder. Lists of Diagnostic LED codes.

Appendix E – POST Code Errors. List of POST code errors that represent specific failures, warnings, or information.

Appendix F – System Packaging Assembly Instructions. Provides detailed instructions to repack the server system into the original Intel packaging.

---

1 An L6 integrated system requires essential components to be installed to make it power-on ready. An L9 integrated system is power-on ready but has no operating system installed. It may require additional options and/or accessories to be installed to enable specific system features.
1.1 Reference Documents and Support Collaterals

For additional information and other support collaterals related to this Intel® server product, see Table 1. Listed documents and utilities can be downloaded from the following Intel websites or can be ordered through a local Intel support representative.

Note: Documents in Table 1 classified as “Intel Confidential” are only made available under a nondisclosure agreement (NDA) with Intel. All Intel product documentation and support collaterals can be downloaded from Intel’s Resource & Documentation Center website: https://www.intel.com/content/www/us/en/documentation-resources/developer.html.

Table 1. Intel® Server M50FCP Family Reference Documents and Support Collaterals

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2. L6 Integrated System—Essential System Component Installation

The Intel® Server System M50FCP1UR options are offered with different level of system integration. System configurations that are not power-on ready are identified as L6 integrated systems. An L6 integrated system requires essential components (sold separately) to be installed. If your Intel system did not come with any of the following components preinstalled, then follow the procedures in this chapter:

- Processors – 4th Gen Intel® Xeon® Scalable processor family
- Memory – Up to 32 DDR5 DIMMs
- Power supply – two required for redundancy

If your Intel server system came with all listed components preinstalled, then skip this chapter and go on to Chapter 3 for installation procedures associated with all other system options and accessories.

![Figure 2. Required Components for Basic System Operation](Ref#: FCP20201)

**Before You Begin**

Before integration of any system components, review all the safety and ESD precautions found in the Safety Warnings section at the beginning of this document.

**System Reference**

In the following procedures, all references to left, right, front, top, and bottom assume that the reader is facing the front of the server chassis.

**Instruction Format**

Each procedure described in this chapter follows an illustration first format. This format gives the reader the option to follow a quicker path to component integration by first seeing an illustration of the intended procedure. If necessary, the reader can then follow the step-by-step instructions that accompany each procedure.
2.1 Chassis Component Identification

The following figure shows the chassis components.

![Figure 3. Chassis Component Identification](image)

2.2 System Top Cover Removal / Installation

The system top cover consists of two panels, one over the front half of the system, and one over the back half of the system. To maintain system thermals, both top cover panels must be in place when the system is operational.

**Required Tools and Supplies**

- Anti-static wrist strap and conductive workbench pad (recommended)
- Phillips* head screwdriver #1

2.5.1 System Cover Removal

Removal of both top cover panels is necessary when servicing any system component integrated within the system. Before removing the top cover, power down the system and unplug all peripheral devices and the system power cords.
The system may have the top cover panels fastened to the chassis. If present, a total of four screws, one on each side of the front cover and one on each side of the back cover, need to be removed to detach each top cover panel from the chassis.

**Note:** A non-skid surface or a stop behind the server system may be needed to prevent the server system from sliding on the work surface.

For each top cover panel:

1. While pushing down on both the left and right buttons of the given top panel (see Letter A), slide the top cover panel towards the front (front panel) or back (back panel) of the chassis (see Letter B).
2. Carefully lift the top cover panel up and away from the chassis.

**Note:** Each top cover panel can slide along the chassis base for 10 mm and then needs to be lifted.
2.5.2 System Cover Installation

For each top cover panel:

1. Carefully align and set the top cover panel on top of the chassis. Then, slide it inwards until it locks into place (see Letter A).

**Shipping Note:** When transporting the server system, Intel recommends installing the four top cover screws before shipping.

2.3 Processor Assembly and Installation

**Components Required:**

- 4th Gen Intel® Xeon® Scalable processors
- Processor tray–Packaging tray that came with the processor
- Processor carrier clip – one for each processor
- Processor heat sink–1U standard heat sink or 1U Enhanced Volume Air Cooling (EVAC) heat sink

**Required Tools and Supplies**

- Anti-static wrist strap and conductive workbench pad (recommended)
- T-30 Torx* screwdriver
- ESD Gloves
- Phillips* head screwdriver #2

The Intel® Server System M50FCP1UR includes dual Socket-E LGA4677 processor sockets compatible with the 4th Gen Intel® Xeon® Scalable processor family.

The server system supports two types of heat sinks as shown in the following figure: The standard 1U heat sink and Enhanced Volume Air Cooling (EVAC) heat sink. The type of heat sink used depends on the system configuration. The 2.5” x 4 front drive system must use the EVAC heat sink on both processors. The 2.5” x 12 front drive system must use the standard 1U heat sink on both processors. For more information, refer to the Intel® Server M50FCP Family Configuration Guide.
Caution: Fin edges of the processor heat sink are very sharp. Intel recommends wearing thin ESD protective gloves when handling the PHM during the following procedures.

Caution: Processor heat sinks are easily damaged if handled improperly. See the following image for proper handling.

For the 4th Gen Intel® Xeon® Scalable processors, two types of processor carrier clips are supported (see following figure). The type of carrier clip used is determined by the processor SKU.

Two types of processor carrier clips are supported by the 4th Gen Intel® Xeon® Scalable processor family for this server product family, they are identified as “E1A” and “E1B”.

---

Figure 7. 1U Heat Sinks

Figure 8. Processor Heat Sink Handling

Figure 9. Supported Processor Carrier Clips
Each type of processor carrier clip will include identifier markings as shown in Figure 10. Match the processor clip to the clip identifier that is etched on the processor heat spreader, as shown in Figure 10.

![Figure 10. Processor Carrier Clip Identifier Markings](image)

**Note:** The etched identifier location in the figure is for illustration purposes only. The location and color may be different on the actual processor and carrier clip.

A processor heat sink module (PHM) assembly and processor socket assembly are necessary to install a processor to the server board. Figure 11 identifies each component associated with the PHM and processor socket assemblies.

![Figure 11. Processor Heat Sink Module (PHM) Reference Diagram](image)
The procedures described in the following sections must be followed in the order specified to assemble the PHM and install it to the server board. These instructions assume that all PHM components are new, and the Thermal Interface Material (TIM, Honeywell® PTM7000) is already applied to the bottom of the heat sink.

### 2.5.1 Processor Heat Sink Module (PHM) Assembly

**Caution:** Wear ESD gloves to prevent electrostatic damage and oxidation or foreign material on processor package and land pads.

**Note:** Installation procedures in the following sections apply to both types of processor heat sink. Steps unique to one heat sink type will be identified.

![Figure 12. Installing Processor Carrier Clip onto Processor–Part 1](image)

1. Position the Pin 1 indicator of the carrier clip with the Pin 1 indicator of the processor (See Figure 12).
2. With the processor still on its shipping tray, place the processor carrier clip over the processor.

![Figure 13. Installing Processor Carrier Clip onto Processor–Part 2](image)

3. Gently press down on two opposite sides at a time of the processor carrier clip until it clicks in place.
4. Remove the heat sink from its packaging. To avoid damage to the heat sink, grasp it by its narrower top and bottom edges.

5. Set the anti-tilt wires to the outward position.
6. Turn the heat sink over and place it bottom side up on a flat surface.
7. Remove the plastic protective film from the Thermal Interface Material (TIM).
8. Align Pin 1 indicator of processor carrier clip with the corner cut-out on the heat sink. For the EVAC heat sink, align the processor carrier clip and the heat sink as shown in Figure 16.

**Note:** In a standard heat sink there are two cut-out corners, either can be used to align Pin 1 indicators.

9. Gently press down the heat sink onto the processor carrier clip until it clicks into place.
10. Ensure that all four heat sink corners are securely latched to the tabs on the processor carrier clip.

### 2.5.2 Processor Installation

**Caution:** Do not touch the socket pins. The pins inside the processor socket are extremely sensitive. A damaged processor socket may produce unpredictable system errors.

![Figure 17. Socket Protective Cover Removal](image)

1. (If present) Remove the processor socket cover by squeezing the finger grips (see Letter A) and pulling the cover up from the processor socket (see Letter B).

**Caution:** Ensure that the processor socket is free of damage or contamination before installing the PHM. If debris is observed, blow it away gently with an air blower. Do not use tweezers or any other hard tools to remove it manually.
1. Set all four anti-tilt wires on the heat sink to the inward position (see Letter A in Figure 19).
2. Align the Pin 1 indicators of the processor carrier clip and processor with the Pin 1 indicator on the bolster plate located around the processor socket.

**Caution:** Processor socket pins are delicate and bend easily. Use extreme care when placing the PHM onto the processor socket. Do not drop it.

3. Holding the PHM horizontally, carefully lower it onto the bolster plate's alignment pins (see Letter B).
4. Set all four anti-tilt wires on the heat sink to the outward position. See Letter D in Figure 19.
5. (EVAC Heat Sink Only) Using a Phillips #2 screwdriver, tighten the heat sink extension screws. See Letter C in Figure 19.
6. Using a T30 Torx* screwdriver, tighten the heat sink fasteners to 8 in-lb. No specific sequence is needed for tightening.

**Important**: A processor socket cover should be installed onto any unpopulated processor socket. Do not install a processor heat sink over a processor socket that is empty.
## 2.4 Memory Module Installation

### Required Tools and Supplies

- Anti-static wrist strap and conductive workbench pad (recommended)

The Intel® Server System M50FCP1UR supports standard DDR5 RDIMMs, 3DS-RDIMMs, and 9x4 RDIMMs. A DDR5 DIMM is commonly referred to as “memory module” in the following procedure.

### Notes:

- DIMM blanks should only be removed when installing a memory module in its place.
- See Appendix B for memory population rules.

![Figure 21. DIMM Blank Removal](image1)

1. Remove the DIMM blank from the desired memory slot:
   - Open the ejection tabs at both ends of the selected memory slot to lift the DIMM blank from the slot (see Letter A).
   - Carefully remove the DIMM Blank from the system (see Letter B).

![Figure 22. Memory Module Installation](image2)

2. Ensure that the ejection tabs at both ends of the memory slot are pushed outward to the open position (see Letter A).
3. Carefully unpack the replacement memory module, taking care to handle the device by its outer edges.

4. Align the notch at the bottom edge of the memory module, with the key in the memory slot (see Letter B).
5. Insert the memory module into the memory slot.
   - Using even pressure along the top edge, push down on the memory module (see Letter C) until the ejection tabs of the memory slot snap into place (see Letter D).
6. Ensure that the ejection tabs are firmly in place (see Letter E).
7. Repeat the procedure for each memory module to be installed.

### 2.5 Power Supply Module Installation

#### Required Tools and Supplies

- Intel power supply kit
- Anti-static wrist strap and conductive workbench pad (recommended)

![Figure 23. Power Supply Installation](image)

1. If present, remove the insert from the power supply bay (see Letter A).
2. Locate and carefully unpack the power supply module.
3. Slide the power supply into the power supply bay until it locks in place (see Letter B).

**Note:** The power supply bay filler panel must be installed in the unused bay for all single power supply configurations.

4. If installing a second power supply, repeat steps 1–3.
3. System Options / Accessory Kit Installation

This chapter provides instructions for the integration of system options and other Intel accessories. If your integrated Intel server system did not come preinstalled with processors, memory, or power supplies, installation procedures for these components are in Chapter 2.

Before You Begin

Before integration of any system components, review all the safety and ESD precautions found in the Safety Warnings section at the beginning of this document.

System Reference

In the following procedures, all references to left, right, front, top, and bottom assume that the reader is facing the front of the server chassis.

Instruction Format

Each procedure described in this chapter follows an illustration first format. This format gives the reader the option to follow a quicker path to component integration by first seeing an illustration of the intended procedure. If necessary, the reader can then follow the step-by-step instructions that accompany each procedure.

3.1 System Top Cover Removal / Installation

See Section 2.2.

3.2 System Cable Routing

All internal cables routed between the back of the system and the front of the system must be routed using the cable channel located between the right air baffle and the right chassis sidewall. See Figure 24.

Cables connected between the onboard PCIe MCIO connectors and the backplane behind the front drive bay are routed using the cable channel located between system fans 4 and 5.

No cables should be routed between the left chassis sidewall and left air baffle, or between the memory modules and processors.
3.3 Riser Card / Add-in Card Installation

The Intel® Server System M50FCP1UR supports various riser card options. Depending on the system configuration, your system may or may not come pre-configured with riser card options installed. This section provides assembly and installation instructions for systems that require riser card installation. Reference the Intel® Server System M50FCP1UR Technical Product Specification for more information on available riser card options.

All system configurations include the mounting brackets for each supported riser card option.
3.5.1 Riser Card Bracket Removal

As shown in the previous figures, there are multiple types of riser card brackets included with the system. The instructions to remove a bracket from the system is the same for each.
1. Power off the system and disconnect the system power cords.
2. Remove the system top cover. See Section 2.5.1
3. If present, disconnect all cables (internal and external) that may be attached to the riser assembly.
4. If present, remove the four fastener screws on the chassis back panel. See Figure 28.

![Figure 29. Riser Card Bracket Removal](image)

5. On the front and back of the riser card bracket, loosen the two screw heads securing the bracket to the server board. See Letter A.
6. Grasp the riser card bracket with both hands and carefully pull it up and away from the chassis. See Letter B.

### 3.5.2 Riser Card Installation

The following riser card installation procedure is the same for all included riser card brackets and supported riser card options.

![Figure 30. Riser Card Installation onto the Bracket](image)

1. Locate and carefully unpack the riser card. Hold the riser card by its edges. To NOT touch the gold edge connector pins.
2. Align the riser card to the threaded standoffs on the mounting bracket.
3. Using the supplied screws, secure the riser card to the bracket. Tighten to 5 in-lb.
3.5.3 PCIe* Add-in Card Installation

Add-in cards installed to riser card #1 or the PCIe* interposer riser card must be oriented with their component side up. See Figure 31.

Figure 31. PCIe* Add-in Card Installation for Riser Slot #1 or PCIe* Interposer Riser Assemblies

An add-in card installed to riser card #2 must be oriented with its component side down as shown in Figure 32.

Figure 32. PCIe* add-in Card Installation for Riser Card on Riser Slot #2

1. If the riser card assembly (bracket and riser card) is still inside the system, remove it from the system following instructions in Section 3.5.1.
2. Remove the screw (see Letter A) holding the filler plate to the bracket. Remove the filler plate. See Letter B.
3. Insert the add-in card until it is fully seated inside the PCIe* slot on the riser card. See Letter C.
4. Using the screw, secure the add-in card to the riser card bracket. See Letter D. Tighten to 5 in-lb.

**Note:** For add-in cards with internal cable connectors, it may be necessary to connect cables before installing the riser card assembly into the system.

### 3.5.4 Riser Card Assembly Installation—for All Riser Assemblies

1. Position the riser card’s edge connector over the riser slot on the server board.
2. Align the two key slots on the back edge of the riser card assembly with the mounting keys on the back of the chassis.
3. Once aligned, press the riser card assembly straight down into the riser slot (see Letter A).
4. Using the two static screw heads on the riser bracket, secure the riser card assembly to the server board (see Letter B). Tighten to 5 in-lb.
5. Connect any required cables to the add-in card. See your add-in card documentation for additional information.
6. Reinstall the system top cover. (see Section 3.1).

**Note:** To transport a fully integrated system, Intel highly recommends the system include four shipping screws (not included) installed to the system back panel (see Figure 34). These screws provide the chassis with additional support by reducing chassis flex and minimizing sag of the base plate. Installed screws should meet the following specifications: flat head, 6–32 thread, 3.75 mm length.

*Figure 33. Riser Card Assembly Installation*

*Figure 34. Back Panel Shipping Screws*
3.4 Front Drive Installation

The Intel® Server System M50FCP1UR has front drive bays that only support 2.5" SSDs. Supported SSDs can have a drive height of 7mm or 15mm. 7mm must be attached to a supplied drive mounting bracket to be compatible with the front drive bays.

All drives are mounted to a tool-less, non-detachable, drive rail. Drives interface with a backplane that is mounted to the back side of the front drive bay. Data I/O cables are attached between the backplane and various storage controller options within the system. The front drives are hot swap capable with supported redundant RAID configurations.

This section provides procedures for drive blank removal, 7mm SSD assembly, and drive installation into the drive bay.

Required Tools and Supplies

- Anti-static wrist strap and conductive workbench pad (recommended)

2.5” Drive Bay

The following figure identifies the 2.5” drive bay components.

![2.5" Drive Bay Components](image)

**Figure 35. 2.5" Drive Bay Components**

**Note:** To ensure proper system airflow requirements, all front drive bays must be populated with either a drive or supplied drive blank.

All drive bays included an integrated drive rail that is used to guide an SSD in and out of the drive bay. The integrated drive rail is not fully removed from the drive bay. When the drive extraction lever is in the open position, it is used to pull out the rail just enough to allow an SSD to be installed to or removed from the drive bay.
3.5.1 Drive Blank Removal

Each drive carrier includes a 2.5” drive blank. Drive blanks should only be removed when replacing it with an SSD.

1. Press the button on the drive extraction lever to release it. See Letter A.
2. Using the lever, pull the drive rail out from the drive bay as far as it allows (see Letter B).
3. Pull the drive blank from the drive bay (see Letter C).

Figure 36. Drive Blank Removal

3.5.2 7 mm 2.5” SSD Drive Support

All drive bays can support a 2.5” SSD that has a height of 7mm. To support these drives, a section of the drive blank is used to mount to the SSD, making it compatible for installation into the drive bay.

1. Remove the drive blank from the system (see Section 3.5.1).
2. One side of the drive blank has a latch used to secure both halves of the drive blank together. To separate the halves, squeeze the latch tabs together (see Letter A), and pull the two halves apart (see Letter B).
3. The blank half without the latch is used as the SSD mounting bracket.

Figure 37. Separating Top and Bottom Parts of Drive Blank
4. Slide the SSD drive into SSD mounting bracket. See Figure 38.

**Important:** To avoid damaging the SSD connector, insert the drive into the mounting bracket in the direction shown.

### 3.5.3 2.5" SSD Drive Installation

Front drive bays can support SSDs with a height of 7mm or 15mm. With the SSD mounting bracket attached to the 7mm drive, installation into the front drive bay is the same for both drive sizes. Note the location of the drive interface connector before installing the drive into the drive bay. Ensure its orientation matches with the interface connector on the backplane.
Figure 40. 2.5” Drive Installation into Front Drive Bay

1. Ensure that the drive extraction lever is in the open position, and the drive rail is pulled out as far as possible.
2. Align and insert the drive into the drive bay. See Letter A.

   **Note:** Intel recommends holding the drive with one hand while holding the lever with the other hand.

3. Slide the drive into the drive bay until it is fully seated within the drive interface connector on the backplane (see Letter B).
4. Close the drive extraction lever until it locks into place. See Letter C.

### 3.5 OCP* 3.0 Network Adapter Installation

This section provides instructions for the installation of an OCP* 3.0 add-in card. OCP add-in cards will have one of two methods to secure the card within the OCP bay. Refer to the sub-section that supports the card to be installed.

- Pull-Tab and Thumb Screw – Section 3.5.2
- Internal Lock – Section 3.5.3

#### Required Tools and Supplies

- OCP 3.0 Network Adapter
- Anti-static wrist strap and conductive workbench pad (recommended)
- Phillips* head screwdriver #1

**Note:** Reference the Intel® Server M50FCP Family Configuration Guide for a list of supported adapter cards.
3.5.1 OCP* Adapter Bay Filler Panel Removal / Installation

**Figure 41. OCP* Adapter Bay Filler Removal**

Remove the filler panel to install an OCP add-in card:

1. Loosen the thumb screw on the right side of the filler (see Letter A).
2. Rotate the right side of the filler away from the chassis approximately 0.5" (13mm) (see Letter B).
3. Pull the filler away from the chassis (see Letter C).

**Figure 42. OCP* Adapter Bay Filler Installation**

Install the filler panel when the OCP card bay is empty:

1. Insert the left side of the filler plate into the slot (see Letter A).
2. Rotate the right side of the filler panel into the OCP card bay (see Letter B).
3. Tighten the thumb screw (see Letter C).
3.5.2 OCP* Adapter with Pull Tab Installation

1. Power off the system and disconnect the system power cords.
2. Remove the OCP Bay filler insert (See Section 3.5.1)
3. Align the OCP adapter with the open OCP bay slot and slide forward until the connectors are fully seated (see Letter A).
4. Tighten the thumb screw on the right side of the OCP adapter (see Letter B).

3.5.3 OCP* Adapter with Internal Lock Installation

All L6 and L9 integrated systems come with an internal lock on the OCP rail. This lock is a piece of blue plastic. The OCP rail in the system has a dedicated space to accommodate the lock. The lock can be mounted on the rail in two different orientations. When the keying features of the lock are facing up, it is in an unlocked orientation. When the keying features are facing down, it is in a locked orientation. A lock symbol is included in each side of the plastic lock to indicate its orientation. The following figure shows the features of the lock.

---

Figure 43. OCP* Adapter with Pull Tab Installation

Figure 44. Internal Lock with Unlock and Lock Orientation
1. Power off the system and disconnect the system power cords.
2. Remove the OCP Bay filler insert (See Section 3.5.1)
3. Remove the system top cover (see Section 2.2)
4. Remove the OCP Bay filler insert (See Section 3.5.1)
5. If present, remove the riser card assembly above the OCP adapter area, (see Section 3.5.1).

   **Note:** In the default shipping configuration, the internal lock is set to the unlock orientation.

6. Squeeze the two hooks of the internal lock and pull it out (see Letter A).
7. Align the OCP* adapter with the open OCP bay slot and slide forward until the connectors make secure contact (see Letter B).
8. Reinstall the internal lock with the lock orientation (see Letter C).
9. Reinstall the riser card assembly (see Section 3.5.4).
10. Reinstall the system top cover (see Section 3.1).

### 3.6 M.2 Storage Device Installation

The server board includes two M.2 connectors as shown in the following figure. Each M.2 connector supports a PCIe* NVMe* or SATA SSD drive that conforms to a 22110 (110 mm) or 2280 (80 mm) form factor.

**Required Tools and Supplies**

- M.2 SSD
- Anti-static wrist strap and conductive workbench pad (recommended)
- Phillips* head screwdriver #1
1. Power off the system and disconnect the system power cords.
2. Remove the system top cover (see Section 3.1).
3. Remove the riser card #1 bracket from the system (see Section 3.5.1).
4. Locate the M.2 connectors towards the back edge of the server board. See Figure 46.
5. Position and install the onboard M.2 mounting stand-off at the appropriate location to match the length of the selected M.2 SSD.
6. Align the notch within the SSD edge connector with the key in the server board M.2 connector.
7. Insert the SSD into the connector (see Letter A).
8. Using the fastener screw, secure the SSD to the M.2 mounting stand-off on the server board. See letter B. Tighten to 1.5 in-lb.
9. Repeat steps 4–8 for the second M.2 SSD if needed.
10. Reinstall the riser card assembly (see Section 3.5.4).
11. Reinstall the system top cover (see Section 3.1).

3.7 Trusted Platform Module (TPM) Installation

This section provides instructions for the installation of a Trusted Platform Module (TPM). Refer to the Intel® Server M50FCP Family Configuration Guide for available options.

Required Tools and Supplies
- Intel® TPM accessory kit
- Anti-static wrist strap and conductive workbench pad (recommended)
- Flat head screwdriver

1. Power off the system and disconnect the system power cords.
2. Remove the system top cover (see Section 3.1).
3. Locate and carefully unpack the TPM kit contents
4. Locate the TPM module connector on the server board.
5. Insert the plastic stand-off into the mounting hole in the server board (see Letter A).
6. Place the TPM module over the connector and confirm the orientation of the module.
7. Press the module down onto the connector (see Better B).
8. Secure the TPM module to the stand-off with either the standard screw or the tamper resistant screw (see Letter C).
   **Note:** As a security feature that deters unauthorized removal of the TPM from the server board, Intel recommends using the tamper resistant screw type. Once installed, its removal is exceedingly difficult.
9. Reinstall the system top cover (see Section 3.1).

### 3.8 Intel® RAID Maintenance Free Backup Unit (RMFBU) Installation

This section provides instructions to install an RMFBU bracket and assembly in the system. Refer to the *Intel® Server M50FCP Family Configuration Guide* for available Intel RAID card options.

**Required Tools and Supplies**

- Intel RMFBU accessory kit
- Anti-static wrist strap and conductive workbench pad (recommended)
- Phillips* head screwdriver #1

The RMFBU assembly has the following elements:

- RMFBU Mounting Plate
- RMFBU plastic housing
- RMFBU plastic housing latch
- RMFBU super-capacitor

The RMFBU mounting plate and housing assembly are mounted in between the system fans and hot-swap backplane.

The following three elements need to be pre-assembled before attachment to the mounting plate.

1. Insert the plastic housing latch into the opening on the plastic housing (see Letter A).
2. Carefully lift on the latch holder (see Letter B) and insert the latch into the opening until it clicks into place (see Letter C).
3. Slide the latch down until aligned vertically (see Letter D).

![Figure 49. Installing Latch on the Plastic Case](WFP4080)
4. Insert the RMFBU super capacitor into the plastic housing with the cable protruding out from one of the cable routing openings. Choose the opening that results in the best cable routing to the RAID module.

5. With the system powered off, disconnect the system power cords.
6. Remove the system top cover (see Section 3.1).
7. (If installed) Remove the cable clip by removing the two screws securing it to the chassis.
8. Locate the RMFBU mounting plate.
9. Align the two screw holes of the RMFBU mounting plate with the matching threaded holes on the chassis base (see Letter A).
10. Secure the RMFBU mounting plate to the chassis using two screws (see Letter B). Tighten to 5 in-lb.
11. Slide the RMFBU housing assembly in the direction as indicated on the mounting plate (see Letter C) until the latch locks in place.
12. Attach cables as required.
13. Reinstall the system top cover (see Section 3.1).
4. System Software Updates and Configuration

The Intel® Server System M50FCP1UR includes a system software stack that consists of:

- CPLD
- System BIOS
- Baseboard Management Controller (BMC) firmware
- Intel® Management Engine (Intel® ME) firmware
- FRU data

Together, they configure and manage features and functions of the server system. A full software stack is installed during the system manufacturing process but may not be the latest available version. Intel highly recommends updating the system software stack to the latest available version for optimal performance and system reliability. A System Update Package (SUP) containing the latest available system software stack can be downloaded from the following Intel website: http://downloadcenter.intel.com.

See the following Intel documents for more in-depth information about the system software stack and their functions:

- BIOS Firmware External Product Specification (EPS)–Intel NDA required
- Integrated Baseboard Management Controller Firmware External Product Specification (EPS)–Intel NDA Required

For guidelines and overview on BIOS Boot Menu, Setup, and hot keys, see the Intel® Server Board M50FCP2SBSTD Technical Product Specification.

4.1 Software License Key Management

Intel offers two different Software License Activation key types – one for enabling the Advanced Server Management Features and one for enabling Intel® VROC for NVMe.

Purchasing an optional Advanced System Management product key (iPC ADVSYMSGMTKEY) allows the following advanced system management features to be enabled:

- Virtual KVM over HTML5
- Virtual Media Local Image Redirection
- Virtual Media shared files and folders redirection
- Out-of-band hardware RAID Management for latest Intel® RAID cards
- Included single system license for Intel® Data Center Manager (Intel® DCM)

Intel® VROC for NVMe is an optional feature and must be activated before it can be used for NVMe RAID configurations.

Intel® VROC for NVMe License Activation key options are the following:

- Standard Intel® VROC Key (iPC VROCSTANKEY) (RAID 0, 1, 10)
- Premium Intel® VROC Key (iPC VROCPREMKEY) (RAID 0, 1, 10, 5)

For guidelines and more information, see the Intel® Server Board M50FCP2SBSTD Technical Product Specification.
4.2 Ordering Software License Key

There are two options available to order a software license key:

- **CTO/L9:** When ordering a fully integrated system from Intel using its on-line Configure-to-Order (CTO) tool, select the required license key (AdvSysMgmtKey, VROCStanKey or VROCPremKey) as an additional option. The Intel factory will then upload the license key on to the system during the system integration process.

- **Add-on Accessory:** A software license key can be ordered separately from the system as an add-on accessory. This option requires that the license key be manually installed on the system. See the following sections for complete ordering and installation instructions.

4.3 Order and Register a License Key as an Add-on Accessory (Not via CTO)

1. Place an order for the required software license key with electronic delivery. Intel Product Codes: 
   - ADVSYSGMTKEY for the Advanced System Management (ASM) Key 
   - VROCSTANKEY for the Intel® Virtual RAID on CPU Standard Software Key 
   - VROCPREMKEY for the Intel® Virtual RAID on CPU Premium Software Key

2. Receive an email with instructions to download the product key.

3. From the email, Click the Register link (see Figure 52) to go to https://servertools.intel.com/registration

4. Login using an existing Intel account or create a new one. An email address is required
5. On the Registration Screen, Click the “Register Product Key” button to register the pre-entered license key number. (see Figure 53)

![Figure 53. Register Key](image)

6. Enter the number of Advanced System Management (ASM) licenses needed. It must be equal or less that the quantity available displayed on the right corner of the screen. Click on the “Generate License(s)” bottom to download the single license file. (see Figure 54)

![Figure 54. Activate Key for Advanced System Management (ASM) Key](image)

**Note:** Only single license file per order is needed to activate multiple systems. If any key or email is lost, Intel can generate new product keys as needed.
7. To activate the license for either **VROCSTANKEY** or **VROCPREMKEY**:

   - Collect the board serial number. There are several ways to get the board serial number, e.g., barcode label attached to the board, BMC web console, Redfish/IPMI API’s and utilities.

   - Multiple board serial numbers can be entered in the text box or by uploading a .JSON file with the list. Only a single license file will be downloaded. This single license file will work with all systems that match one of the serial numbers. (see Figure 55)

![Figure 55. Activate Key for Intel® Virtual RAID on CPU Standard/Premium Software Key](image)

   - If using file to upload serial numbers (vs. text box), the following is the JSON format that should be in the file:

     ```json
     {
     "serialNumbers":
     ["SERIAL1","SERIAL2","SERIAL3"]
     }
     ```

     Click on “Generate License(s)” button to download the single license file. The quantity of the board serial numbers entered must be equal or less than the quantity available displayed on the right corner of the screen.

   **Note:** Make sure to enter the board serial number NOT the product serial number. Only one of the two methods either the JSON file or the text box is accepted. The license file will work with all systems that match one of the board serial numbers. If any key or email is lost, Intel can generate new product keys as needed.

8. Upload the license key file to the BMC.
4.4 Software License Key Installation

Three available options can be used to upload a software license onto a server:

- Integrated BMC Web Console
- Intel® Server Configuration Utility
- Redfish* Interface

4.5.1 Installation Using the Integrated BMC Web Console

The following procedure may be used to upload and confirm activation of a software license key. The example below illustrates the process of uploading the Advanced System Management (ASM) license using the Integrated BMC Web Console. The same process can be used to upload a VROC software license key.

1. Login to the Integrated BMC Web Console
2. Navigate to the Configuration > License Management page
3. Click the Choose File button to select the license key file
4. Select the .v2c license key file, then click the Open button
5. Click the Upload button to upload the ASM License Key or VROC software License key to the BMC
6. The System Management Key/VROC Upgrade Key section will show the license type and activated features
7. Navigate back to the System Tab. On the System Information page, view the System Summary information box to confirm the Advanced Management Key was successfully Activated.

![Integrated BMC Web Console](image_url)
Installation Using the Intel® Server Configuration Utility

The following procedure may be used to upload and confirm activation of the license keys using the `syscfg` command line utility.

To download the latest utility package, go to [https://downloadcenter.intel.com/](https://downloadcenter.intel.com/) and search for the “Intel Server Configuration Utility”.

Prerequisites:

- Ensure the user has Administrator or Root privileges for the chosen operating system
- Ensure the KCS Policy Control Mode is set to “Provisioning”

Procedure:

1. Install the Intel® Server Configuration Utility on the target server system. See the Intel® Server Configuration Utility User Guide for installation instructions.
2. Navigate to the sub-directory where the Server Configuration Utility was installed.
3. From a command prompt run the following command

   `syscfg /lic <key file name>`

where “file name” can be just the name of the license file if copied to the same directory as the `syscfg` command file, or the complete path of where the license key was copied can be entered along with the file name.

The example below illustrates the process of uploading the VROC standard software license key. The same process can be used to upload the Advanced Server Management license key.
4. To confirm activation of the VROC license key, type the following command:
   
   `syscfg /d lic`

4.5.3 Installation Using Redfish*

The following steps may be used to upload and confirm activation of a software license key using Redfish*.

**Prerequisites:**
- If not already present, install the “curl” and “grep” utilities onto the system from which the commands will be run.

**Issue the following command to upload a software license key to the BMC:**

```bash
curl -k -u username:password
   -H "Content-Type: multipart/form-data" -F "updateFile=@filepath" -X POST
```

**Notes:**
- The command line above is a single command line
- `username:password` in the command line above should be replaced with the name of the user and their password

See the example below where:
- `username = admin`
- `password = password`
- `BMC_IP = 192.168.0.102`
- `filepath = VROCPREMKEY.v2c`
Figure 60. Redfish Command to Upload the VROC Premium Software License Key

Issue the following command to verify the activation status of the license keys.

```bash
curl -k -u username:password
https://BMC_IP/redfish/v1/UpdateService/SoftwareInventory/LicenseManagement#Oem/LicenseInventory/Licenses -H "content-type: application/json" -X GET | grep -A1 LicenseStatus
```

Figure 61. Redfish Command to verify the activation status of the VROC Software License Key
5. **System Service–System Features Overview**

This chapter provides service personnel a reference to identify and locate the features associated with the Intel® Server System M50FCP1UR. For more information, refer to the *Intel® Server System M50FCP2UR Technical Product Specifications*.

### 5.1 Front Drive Bay Options

**Figure 62. 4 x 2.5" Front Drive Bay Configuration–M50FCP1UR204**

**Figure 63. 12 x 2.5" Front Drive Bay Configuration–M50FCP1UR212**

### 5.2 Back Panel, Front Control Panel, Front I/O Features

**Figure 64. Back Panel Features**
Figure 65. Front Control Panel Features

Figure 66. Front I/O Features
5.3 Drive Bay LED Identification

Table 2. Drive Status LED States

<table>
<thead>
<tr>
<th>Amber</th>
<th>LED State</th>
<th>Drive Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>No access and no fault</td>
<td></td>
</tr>
<tr>
<td>Solid on</td>
<td>Hard drive fault has occurred</td>
<td></td>
</tr>
<tr>
<td>1 Hz blinking</td>
<td>RAID rebuild in progress</td>
<td></td>
</tr>
<tr>
<td>2 Hz blinking</td>
<td>Locate (identify)</td>
<td></td>
</tr>
</tbody>
</table>

Table 3. Drive Activity LED States

<table>
<thead>
<tr>
<th>Green</th>
<th>Condition</th>
<th>Drive Type</th>
<th>LED Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Power on with no drive activity</td>
<td>SAS/NVMe*</td>
<td>LED stays on</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SATA</td>
<td>LED stays off</td>
</tr>
<tr>
<td></td>
<td>Power on with drive activity</td>
<td>SAS/NVMe*</td>
<td>LED blinks off when processing a command</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SATA</td>
<td>LED blinks on when processing a command</td>
</tr>
<tr>
<td></td>
<td>Power on and drive spun down</td>
<td>SAS/NVMe*</td>
<td>LED stays off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SATA</td>
<td>LED stays off</td>
</tr>
<tr>
<td></td>
<td>Power on and drive spinning up</td>
<td>SAS/NVMe*</td>
<td>LED blinks</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SATA</td>
<td>LED stays off</td>
</tr>
</tbody>
</table>

Note: The drive activity LED is driven by signals from the drive itself. Drive vendors may choose to operate the activity LED different from what is described in Table 3. If the activity LED on a given drive type behaves differently than what is described, customers should reference the drive vendor specifications for the specific drive model to determine the expected drive activity LED operation.
5.4 Server Board Features

The following figure provides a general overview of the physical server board, identifying key feature and component locations.

![Diagram of Intel® Server Board M50FCP2SBSTD Component / Feature Identification](image)

**Figure 68. Intel® Server Board M50FCP2SBSTD Component / Feature Identification**
The server board includes LEDs to identify system status and/or indicate a component fault. The following figures identify the diagnostic LEDs and their location on the server board.

Figure 69. Intel® Light-Guided Diagnostics–LED Identification

Figure 70. View of POST Code Diagnostic, System ID, and System Status LEDs Area
5.5 System Configuration and Recovery Jumpers

The server board includes jumper blocks that can be used to configure, protect, or recover specific features of the server board. The following figure identifies the location of each jumper block on the server board. For more information on the jumpers, see the Intel® Server Board M50FCP2SBSTD Technical Product Specification (TPS).

Figure 72. Reset and Recovery Jumper Block Locations
This chapter provides instructions for replacement of system components considered to be field replaceable (FRU). Only system features that are identified as hot-swappable can be replaced while the system remains operational. These items include:

- Power Supply–In dual power supply configurations only
- Drives mounted in the front drive bay–Redundant RAID (1, 5, 6, and 10) configurations only
- System Fans

All other components in the system can only be serviced after the system has been powered off and AC power cords have been disconnected from the server system.

**Before You Begin**

Before integration of any system components, review all the safety and ESD precautions found in the Safety Warnings section at the beginning of this document.

**System Reference**

In the following procedures, all references to left, right, front, top, and bottom assume that the reader is facing the front of the server chassis.

**Instruction Format**

Each procedure described in this chapter follows an illustration first format. This format gives the reader the option to follow a quicker path to component integration by first seeing an illustration of the intended procedure. If necessary, the reader can then follow the step-by-step instructions that accompany each procedure.
6.1 System Top Cover Removal / Installation

The system top cover consists of two panels, one over the front half of the system and one over the back half of the system. To maintain system thermals, both top cover panels must be in place when the system is operational.

**Required Tools and Supplies**

- Anti-static wrist strap and conductive workbench pad (recommended)
- Phillips* head screwdriver #1

6.5.1 System Cover Removal

Removal of both top cover panels is necessary when servicing any system component in the server chassis. Before removing the top cover, power down the system and unplug all peripheral devices and the system power cords.

![Figure 73. System Top Cover Panel Shipping Screws](image)

The top cover panels may be secured to the chassis using four screws, two on each side of the chassis. See Figure 73. If present, these need to be removed to detach both top cover panels from the chassis.

**Note:** A non-skid surface or a stop behind the server system may be needed to prevent the server system from sliding on the work surface.

![Figure 74. System Cover Removal](image)
For each top cover panel:

1. While pushing down on both the left and right buttons of the given top panel (see Letter A), slide the top cover panel towards the front (front panel) or back (back panel) of the chassis (see Letter B).
2. Carefully lift the top cover panel up and away from the chassis.

**Note:** Each top cover panel can slide along the chassis base for 10 mm and then needs to be lifted.

### 6.5.2 System Cover Installation

![System Cover Installation](image)

For each top cover panel:

1. Carefully align and set the top cover panel on top of the chassis. Then, slide it inwards until it locks into place (see Letter A).

**Shipping Note:** When transporting the server system, Intel recommends installing the four top cover screws before shipping.
6.2 System Fan Replacement

All system fans are designed to be hot-swappable and require no tools for replacement. All system fans include a fan fault LED on the server board next to each system fan connector. The integrated baseboard management system will light the LED when it detects a fan fault. Remove the front top cover panel to access any of the system fans.

**CAUTION:** a faulty system fan with dual rotors may still have a functional rotor. Fan rotors spin at very high speeds. Extreme caution should be taken when performing a hot replacement of a system fan. When removing a system fan from an operational system, use two hands to grasp the two greens tabs found on the top edges of the fan assembly, and pull straight up. Let the rotor stop completely before handling the system fan. Keep fingers away from the front and back fan grates.

Components in an operational system can get extremely hot. Avoid touching any components in the system while swapping out a defective system fan.

To minimize performance degradation, and other thermal related issues, system fan replacement while the system is operational should be performed as quickly as possible.

For safety, Intel recommends replacing a faulty system fan with the system powered off whenever possible.

**Required Tools and Supplies**

- Intel spare fan kit
- Anti-static wrist strap and conductive workbench pad (recommended)

![Figure 76. Individual Fan Removal](image)

1. Remove the front top cover panel (see Section 6.1.1).

   **Note:** For hot fan replacement, the system power cords do not need to be disconnected before removing the top cover.

2. If performing a hot replacement, identify the faulty fan by locating the illuminated FAN FAULT LED on the server board next to the connector of the faulty fan.

3. Using two hands, grasp the two greens tabs found on the top edges of the fan assembly, and pull straight up (see Letter A), releasing the fan from its housing and the server board connector. (See Letter B).
4. Carefully place the fan onto a flat surface.

5. Locate and unwrap the replacement fan.
6. Ensure that the empty fan slot within the assembly housing is clear of any cables.
7. Align the fan connector with the server board connector, and carefully lower the fan into the fan assembly housing. Gently push down until fully seated (see Letter A).
8. Ensure that the fan connector is fully seated within the connector on the server board. See Letter B.
9. Reinstall the system top cover (see Section 6.5.2).

6.3 Memory Module Replacement

Required Tools and Supplies
- Anti-static wrist strap and conductive workbench pad (recommended)
- Replacement equivalent memory module

Note: Replacement DDR5 DIMMs must be identical or have “Like DIMM” attributes as defined in Appendix B.

Average Time to Complete: ~ 5 minutes

Procedure Prerequisites
- Memory modules are NOT hot-swappable. Before replacing a faulty memory module in the system, power down the system and unplug the AC power source for at least 30 seconds, ensuring all power supply status LEDs and board LEDs are off.

A DDR5 DIMM is commonly referred to as “memory module” in the following instructions.
Figure 78. Memory Module Removal

1. Power off the system and disconnect the system power cords.
2. Remove the top cover panels (see Section 6.5.1).
3. Identify and locate the memory module to be replaced.
4. Ensure that the ejection tabs of adjacent memory slots are closed.
5. Open the ejection tabs at both ends of the selected memory slot (see Letter A). The memory module lifts slightly from the memory slot.
6. Holding the memory module by its edges, lift it away from the slot (see Letter B).

Figure 79. Memory Module Installation

7. Ensure that the ejection tabs at both ends of the memory slot are pushed outward to the open position (see Letter A).
8. Carefully unpack the replacement memory module, taking care to hold the device by its outer edges only.
9. Align the notch in the memory module edge connector edge with the key in the memory slot (see Letter B).
10. Insert the memory module into the memory slot.
   • Using even pressure along the top edge, push down on the memory module (see Letter C) until the ejection tabs of the memory slot snap into place (see Letter D).
11. Ensure that the ejection tabs are firmly in place (see Letter E).
12. Reinstall the system top cover (see Section 6.5.2).
6.4 Power Supply Replacement

Required Tools and Supplies

- Intel spare power supply kit
- Anti-static wrist strap and conductive workbench pad (recommended)

Caution: The power supply is only hot-swappable (system does not have to be powered down) if the system has both power supplies installed, and the system is still operational with a single functional power supply.

Figure 80. Power Supply Removal

1. Detach the power cord from the power supply to be removed.
2. Push and hold the green latch in the direction shown (see Letter A).
3. Use the handle to pull the power supply module from the system (see Letter B).

Figure 81. Power Supply Installation

4. Locate the replacement power supply.
5. Slide the power supply into the power supply bay until it locks in place (see Letter A).
6.5 Processor Replacement

Components Required:
- New 4th Gen Intel® Xeon® Scalable processor + included shipping tray
- Existing processor carrier clip
- Existing 1U standard heat sink or 1U Enhanced Volume Air Cooling (EVAC) heat sink + new thermal interface material (TIM, Honeywell* PTM7000)

Required Tools and Supplies
- Anti-static wrist strap and conductive workbench pad (recommended)
- ESD Gloves (recommended)
- T-30 Torx® screwdriver
- Phillips® head screwdriver #2

Note: The following sections show the EVAC heat sink in the figures. The procedures described apply to both heat sink types.

Caution: Fin edges of the processor heat sink are very sharp. Intel recommends wearing thin ESD protective gloves when handling the PHM during the following procedures.

Caution: Processor heat sinks are easily damaged if handled improperly. See the following figure for proper handling.

Figure 82. Processor Heat Sink Handling

Two types of processor carrier clips are supported by the 4th Gen Intel® Xeon® Scalable processor family for this server product family, they are identified as “E1A" and “E1B".

Figure 83. Supported Processor Carrier Clips
Each type of processor carrier clip will have an identifier marking: E1A or E1B. The processor will have an etch on its heat spreader identifying the supported type of carrier clip. Match the processor to the supported processor clip as shown in Figure 84.

![Figure 84. Processor Carrier Clip Identifier Markings](image)

**Note**: The etched identifier location in the figure is for illustration purposes only. The location and color may be different on the actual processor and carrier clip.

### 6.5.1 Processor Heat Sink Module (PHM) and Processor Removal

1. Power off the system and disconnect the system power cords.
2. Remove the system top cover (see Section 6.5.1).
3. Remove or set aside all system components preventing access to the processors.
4. Ensure the anti-tilt wire on the four corners of the heat sink, is in the outward position (see Letter A).
5. Fully unscrew all four heat sink fasteners in any order (see Letter B).
6. Push the anti-tilt wire on the four corners of the heat sink, to the inward position (see Letter C).
7. Lift the PHM straight up and away from the server board (see Letter D).
8. Place the PHM, bottom side up, on a flat surface.
9. Visually inspect that the socket is free of damage or contamination.
Caution: If debris is observed, blow it away gently with an air blower. Do not use tweezers or any other hand tools to remove it manually.

If reinstalling the processor later, then Intel highly recommends installing the processor socket protective cover that shipped with the system to prevent pin damage while the socket is not populated.

Figure 86. Reinstall the Socket Cover

- Squeeze the finger grips at each end of the cover (see Letter A) and carefully lower the cover on to the socket (see Letter B). Once seated, release finger grips.
- Carefully check that the socket cover is locked in place.

Caution: Do not press the center of the socket cover.

Figure 87. Processor Removal from PHM Assembly

10. While holding down the PHM, carefully rotate the lever (see Letter A) from left to right until the processor lifts from the processor carrier clip.
11. While holding down the processor carrier clip, carefully lift the processor from it (see Letter B).
12. Return the lever to the original position (see Letter C).
13. Unlatch the tab on each corner of the processor carrier clip to release it from the heat sink (see Letter D).
14. Lift the processor carrier clip up and away from the heat sink (see Letter E).

6.5.2 Processor Heat Sink Module (PHM) Assembly

The procedures described in the following sections must be followed in the order specified to assemble the PHM and install it onto the server board. These instructions assume that the Thermal Interface Material (TIM, Honeywell* PTM7000) is already applied to the bottom of the heat sink.

Caution: Wear ESD gloves to prevent electrostatic damage and oxidation or foreign material on processor package and land pads.

Figure 89. Installing Processor Carrier Clip onto Processor—Part 1

1. Position the Pin 1 indicator of the carrier clip with the Pin 1 indicator of the processor (See Figure 89).
2. With the processor still on its shipping tray, place the processor carrier clip over the processor.
3. Gently press down on two opposite sides of the carrier clip until it clicks into place. Repeat with the other two sides (See Figure 90).

4. Locate the processor heat sink. To avoid damage to the heat sink, grasp it by its narrower top and bottom edges as shown in Figure 91.

5. Set the anti-tilt wires to the outward position.
6. Turn the heat sink over and place it bottom side up on a flat surface.
7. Clean any residual old Thermal Interface Material (TIM) from the heat sink and apply new TIM.
8. Carefully lift and turn over the heat sink.
9. Align the Pin 1 indicator of the processor carrier clip with the corner cut-out on the heat sink (See Figure 93).

**Note:** For the standard heat sink, there are two cut-out corners; either can be used to align Pin 1 indicators.

10. Gently press down the heat sink onto the processor carrier clip until it clicks into place.
11. Ensure that all four heat sink corners are securely latched to the carrier clip tabs.

### 6.5.3 Processor Heat Sink Module (PHM) Installation

**Caution:** Do not touch the socket pins. The pins inside the processor socket are extremely sensitive. A damaged processor socket may produce unpredictable system errors.

1. (If present) Remove the protective cover by squeezing the finger grips (see Letter A) and pulling the cover up and away from the processor socket. See Letter B.

**Caution:** Ensure that the processor socket is free of damage or contamination before installing the PHM. If debris is observed, blow it away gently with an air blower. Do not use tweezers or any other hard tools to remove it manually.
2. Set anti-tilt wires on all four corners of the heat sink to the inward position (see Letter A in Figure 96).
3. Align the Pin 1 indicators of the processor carrier clip and processor with the Pin 1 indicator on the bolster plate located around the processor socket (See Figure 95).

**Caution:** Processor socket pins are delicate and bend easily. Use extreme care when placing the PHM onto the processor socket. Do not drop it.

4. Carefully lower the PHM onto the bolster plate alignment pins (see Letter B).
5. Using a Phillips #2 screwdriver, tighten the heat sink extension screws (see Letter C).
6. Set all four anti-tilt wires on the heat sink to the outward position (see Letter D).
7. Using a T30 Torx* screwdriver, tighten the heat sink fasteners to 8 in-lb. No specific sequence is needed for tightening.
8. Reinstall the system top cover (see Section 6.5.2).
6.6 Riser Card Replacement

This section provides instructions for the replacement of a riser card.

Required Tools and Supplies

- Replacement riser card accessory kit
- Anti-static wrist strap and conductive workbench pad (recommended)
- Phillips* head screwdriver #1

The system includes three different riser card brackets. The replacement instructions are the same for each.

1. Power off the system and disconnect the system power cords.
2. Remove the system top cover (see Section 6.5.1).
3. (If present) Unscrew the four fastener screws on the chassis back panel. See Figure 98.
4. (If present) Disconnect all cables (internal and external) that may be attached to the riser assembly.
5. On the front and back of the riser card bracket, loosen the two screw heads securing the bracket to the server board. See Letter A.
6. Grasp the riser card bracket with both hands and carefully pull it up and away from the chassis. See Letter B.
7. If an add-in card is present, remove it from the riser bracket assembly.
8. Remove the riser card from the Bracket.

9. Locate and carefully unpack the riser card. Hold the riser card by its edges. To NOT touch the gold pins of the edge connector.

10. Install the riser card to the riser card bracket

Note: The following installation instructions for riser card to bracket are the same for all included riser card brackets and supported riser card options.

- Align the riser card to the threaded standoffs on the mounting bracket.
- Using the supplied screws, secure the riser card to the bracket. Tighten to 5 in-lb.
10. Reinstall the add-in card into the riser card
11. Using the fastener screws, secure the add-in card to the riser card bracket (see Letter B). Tighten to 5 in-lb.

**Note:** For add-in cards with internal cable connectors, it may be necessary to connect cables before installing the riser card assembly into the system. See Section 3.2 for cable routing guidance.

The following installation procedure is the same for all riser card assemblies.

12. Position the riser card edge connector over the server board riser slot.
13. Align the two key slots on the back edge of the riser card assembly with the mounting keys on the back of the chassis.
14. Once aligned, press the riser card assembly straight down into the riser slot (see Letter A).
15. Using the two static screw heads on the riser bracket, secure the riser card assembly to the server board (see Letter B). Tighten to 5 in-lb.
16. Connect any cables to the add-in card that are required. See your add-in card documentation for additional information.
17. Reinstall the system top cover.
18. Reinstall the system top cover (see Section 6.5.2).

**Note:** To transport a fully integrated system, Intel highly recommends the system include four shipping screws (not included) installed to the system back panel (see Figure 105). These screws provide the chassis with additional support by reducing chassis flex and minimizing sag of the base plate. Installed screws should meet the following specifications: flat head, 6–32 thread, 3.75 mm length.

![Figure 105. Back Panel Shipping Screw Locations](Image)
6.7 Front Drive Replacement

The Intel® Server System M50FCP1UR has front drive bays that only support 2.5" SSDs. Supported SSDs can have a drive height of 7mm or 15mm. 7mm must be attached to a supplied drive mounting bracket to be compatible with the front drive bays.

All drives are mounted to a tool-less, non-detachable, drive rail. Drives interface with a backplane that is mounted to the back side of the front drive bay. Data I/O cables are attached between the backplane and various storage controller options within the system. The front drives are hot swap capable with supported redundant RAID configurations.

This section provides procedures for the replacement of a faulty SSD.

Required Tools and Supplies

- Replacement 2.5" Solid State Drive (SSD)
- Anti-static wrist strap and conductive workbench pad (recommended)

The following figure identifies the 2.5" drive bay components.

Note: To ensure proper system airflow requirements, all front drive bays must be populated with either a drive or supplied drive blank.

Note: The integrated 2.5" drive rails are not removable. They slide out far enough to allow SSDs or drive blanks to be serviced. When sliding out a drive rail from the drive bay, only pull it as much as it allows without forcing it.

6.5.1 2.5" SSD Drive Removal

Figure 106. Drive Bay Components

Figure 107. 2.5" 15 mm Drive Removal
1. Press the button on the drive extraction lever to release it. See Letter A.
2. Using the lever, pull the drive rail out from the drive bay as far as it allows (see Letter B).
3. Pull the drive from the drive bay (see Letter C).

### 6.5.2 7 mm 2.5" SSD Drive Replacement

**Note:** Skip this section if replacing a 15mm SSD.

SSDs with a height of 7 mm are attached to a mounting bracket. When replacing a 7 mm drive, the mounting bracket must be detached from the SSD and re-attached onto its replacement before it can be installed into the drive bay.

![Figure 108. Detaching a 7mm SSD from its mounting bracket](image)

1. Slide the mounting bracket up and away from the SSD
2. Locate and carefully unpack the replacement SSD

![Figure 109. 7mm SSD Assembly](image)

3. Slide the 7mm SSD up into the mounting bracket
6.5.3  2.5” SSD Drive Installation

The procedure to install a drive into a drive bay is the same for both 7mm (drive + bracket) and 15mm SSDs. Note the drive orientation before installing the drive into the drive bay. Installing a drive incorrectly can damage the interface connectors of the drive and the backplane.

![Drive Rail Extraction Lever Release](image1.png)

**Figure 110. Drive Rail Extraction Lever Release**

1. Release and position the extraction lever out to the fully open position. Pull out the drive rail as far as it allows.

![7mm (Drive + Bracket) Drive Placement Orientation–Bracket Side Up](image2.png)

**Figure 111. 7mm (Drive + Bracket) Drive Placement Orientation–Bracket Side Up**

2. Align the drive with the open drive bay and position the SSD onto the drive rail.

![2.5” Drive installation into drive bay](image3.png)

**Figure 112. 2.5” Drive installation into drive bay**
3. Insert the drive into the drive bay (see Letter A).

   **Note:** Intel recommends holding the drive with one hand while holding the lever with the other hand.

4. Slide the drive forward until it is fully connected with the backplane (see Letter B).
5. Complete the drive installation by closing the drive extraction lever until it locks into place (see Letter C).

### 6.8 2.5" Drive Mounting Rail Replacement

Systems that support 2.5" front drive bays include a drive rail used to guide SSD into or out of a front drive bay. Removal of the drive rail from the drive bay is not required when servicing an SSD. However, if damaged, the drive rail can be removed from the drive bay for repair and or replacement.

**Required Tools and Supplies**

- 2.5" drive mounting rail kit
- Anti-static wrist strap and conductive workbench pad (recommended)

The following figure shows the backside of the drive rail identifying the two alignment keys and the locking tab.

![Drive Rail Features Identification](image1)

**Figure 113. Drive Rail Features Identification**

1. Remove the drive rail from the front drive bay.

![Removing Drive Rail](image2)

**Figure 114. Removing Drive Rail**
• Release and set the extraction lever to the fully open position
• Looking inside the drive bay, visually locate the locking tab on the drive rail
• Using a flat head screwdriver, carefully twist the locking tab inward to unlock the drive rail from the drive bay (see Letter A).
• Gently lift the drive rail from the alignment slot and pull it out and away from the drive bay.

**Note:** Handle the drive rail with care. Do not bend or twist it.

2. Install the drive rail into the drive bay.

![Figure 115. Installing Drive Mounting Rail](image)

- Release and set the extraction lever to the fully open position
- Align and insert the two alignment keys on the drive rail with the alignment slot on the side of the drive bay (see Letter A).
- Slide the drive rail towards the back of the bay until it locks in place (see Letter B).
6.9  Ethernet Network Adapter for OCP* Replacement

This section provides instructions for replacement of an OCP* add-in card. OCP add-in cards will have one of two methods to secure the card within the OCP bay. Refer to the section that supports the card type to be replaced.

- Pull-Tab and Thumb Screw – Section 6.9.1
- Internal Lock – Section 6.9.2

**Required Tools and Supplies**

- OCP Ethernet Network Adapter
- Anti-static wrist strap and conductive workbench pad (recommended)
- Phillips head screwdriver #1

Note: The OCP card bay must have a filler plate installed when not populated with an OCP card.

6.5.1  OCP* Add-in Card with Pull Tab Replacement

![Figure 116. OCP* Adapter with Pull Tab Removal](Ref #: FCP400200)

1. Loosen the thumb screw on the right side of the OCP adapter (see Letter A).
2. Using the pull tab on the left side of the OCP card, pull the card from the bay (see Letter B).
3. Locate and carefully unpack the replacement card.
4. Align the OCP adapter with the open OCP bay and slide it forward until the connectors make secure contact (see Letter A).
5. Secure the card to the chassis using the thumb screw on the right side of the OCP card (see Letter B).

6.5.2 OCP* Adapter with Internal Lock Replacement

All L6 and L9 integrated systems come with an internal lock on the internal OCP mounting rail. This lock is a piece of blue plastic. The OCP rail in the system has a dedicated space to accommodate the lock. The lock can be mounted on the rail in two different orientations. When the keying features of the lock are facing up, it is in an unlocked orientation. When the keying features are facing down, it is in a locked orientation. A lock symbol is included in each side of the plastic lock to indicate its orientation. The following figure shows the features of the lock.

1. Remove the system top cover (see Section 6.5.1).
2. Remove the Riser #2 assembly from above the OCP adapter area (see Section 6.6).
3. Squeeze the two hooks of the internal lock and removed it from the OCP rail (see Letter A).
4. Turn the lock over and reinstall it back onto the OCP rail (see Letter B).
5. Push the OCP adapter out of the bay from inside the chassis (see Letter C).

Figure 120. OCP* Adapter with Internal Lock Installation

6. Squeeze the two hooks of the internal lock and remove it from the OCP rail (see Letter A).
7. Align the OCP adapter with the open OCP* bay slot and slide forward until the connectors make secure contact (see Letter B).
8. Reinstall the internal lock with the lock orientation (see Letter C).
9. Reinstall the riser card assembly as needed (see Section 6.6).
10. Reinstall the system top cover (see Section 6.5.2).

6.10 M.2 Storage Device Replacement

The server board includes two M.2 connectors as shown in the following figure. Each M.2 connector supports a PCIe* NVMe* or SATA SSD drive that conforms to a 22110 (110 mm) or 2280 (80 mm) form factor.

Required Tools and Supplies

- Replacement M.2 SSD
- Anti-static wrist strap and conductive workbench pad (recommended)
- Phillips* head screwdriver #1

Figure 121. M.2 SSD Removal

1. Power off the system and disconnect the system power cords.
2. Remove the system top cover (see Section 6.5.1).
3. Remove the Riser #1 assembly (see Section 6.6).
4. Locate the M.2 to be replaced.
5. Remove the screw to release the M.2 SSD from the server board (see Letter A).
6. Carefully lift the free end of the M.2 SSD and gently remove it from the connector in the direction shown (see Letter B).
7. Locate and carefully unpack the replacement M.2 SSD. Hold it by its edges.

![Figure 122. M.2 SSD Installation](image)

8. Depending on the length of the M.2 SSD, use the onboard M.2 mounting stand-off at the appropriate location.
9. Align and insert the M.2 SSD with the connector on the server board. See Letter A.
10. Using the screw, secure the SSD to the mounting stand-off (see Letter B). Tighten to 1.5 in-lb.
11. Reinstall the riser card assembly (see Section 6.6).
12. Reinstall the system top cover (see Section 6.5.2).

### 6.11 Intel® RAID Maintenance Free Backup Unit (RMFBU) Replacement

This section provides instructions to replace an RMFBU bracket and assembly in the system.

**Required Tools and Supplies**

- Replacement RMFBU Kit
- Anti-static wrist strap and conductive workbench pad (recommended)

![Figure 123. Intel® RMFBU Mounting Bracket Removal - Chassis](image)

1. Remove the system top cover (see Section 6.5.1).
2. Disconnect RMFBU cables.
3. Locate the RMFBU housing assembly and slide the latch up to unlock the assembly from the mounting plate (see Letter A).

4. Slide the RMFBU housing assembly (see Letter B) towards the system fans. When free from the mounting plate, lift it up and out of the system.

5. Remove the RMFBU from the plastic housing

6. Locate and carefully unpack the replacement RMFBU

7. Insert the RMFBU super capacitor into the plastic housing with the cable protruding out from one of the cable routing openings. Choose the opening resulting in the best cable routing to the RAID module.

8. Slide the RMFBU housing assembly in the direction as indicated on the mounting plate (see Letter C) until the latch locks in place.

9. Attach cables as required.

10. Reinstall the system top cover (see Section 6.5.2).
6.12 Backplane Replacement

Depending on the system configuration, the Intel® Server System M50FCP1UR includes either a 4 x 2.5" backplane or 12 x 2.5" backplane. This section provides the procedures necessary to replace both types.

6.5.1 4 X 2.5” Backplane Replacement

Required Tools and Supplies

- Intel backplane kit
- Anti-static wrist strap and conductive anti-static wrist strap and conductive workbench pad (recommended)
- Phillips® head screwdriver #1

1. Power off the system and disconnect the system power cords.
2. Remove the system top cover (see Section 6.5.1).
3. Remove all drives and drive blanks from the front drive bays. NOTE: If drives are configured to a RAID partition, label the drives to identify the drive bay location from which they were removed.
4. Disconnect all cables from the backplane. NOTE: If drives are configured to a RAID partition, label each drive I/O cable to identify the backplane cable connection from which they were disconnected.
5. Remove the three screws securing the backplane to drive bay (see Letter A).
6. Lift the backplane up from the chassis base and pull it out from the system (see Letter B).
7. Locate and carefully unpack the replacement backplane.

   **Note:** Hold the backplane by its edges. Do not touch any components mounted to the backplane.

8. Align and lower the bottom edge of the backplane with the three tabs on the chassis base. See Figure 127 (see Letter A).

9. Verify the alignment of the three backplane mounting holes with the threaded studs of the front drive bay.

10. Secure the backplane with three screws as shown (see Letter B).

11. Re-attach all cables to the backplane.

12. Reinstall all drives and/or drive blanks into the front drive bay.

**Notes:**
- All front drive bays must be populated with an SSD or supplied drive blank.
- If the front drives were configured as part of a RAID partition, ensure that all drive I/O cables and drives were reinstalled to the same locations as they were configured before the procedure.

13. Reinstall the system top cover (see Section 6.5.2).
6.5.2  12 X 2.5" Backplane Replacement

Required Tools and Supplies

- Intel backplane kit
- Anti-static wrist strap and conductive anti-static wrist strap and conductive workbench pad (recommended)
- Phillips* head screwdriver #1

1. Power off the system and disconnect the system power cords.
2. Remove the system top cover (see Section 6.5.1).
3. Remove all drives and drive blanks from the front drive bays. NOTE: If drives are configured to a RAID partition, label the drives to identify the drive bay location from which they were removed.
4. Disconnect all cables from the backplane. NOTE: If drives are configured to a RAID partition, label each drive I/O cable to identify the backplane cable connection from which they were disconnected.
5. Remove the seven screws securing the backplane to drive bay (see Letter A).
6. Lift the backplane up from the chassis base and pull it out from the system (see Letter B).
7. Locate and carefully unpack the replacement backplane.
8. Note: Hold the backplane by its edges. Do not touch any components mounted to the backplane.
9. Align and lower the bottom edge of the backplane with the three tabs on the chassis base. See Figure 127 (see Letter A).
10. Verify the seven mounting holes of the backplane align with the threaded studs of the front drive bay.
11. Secure the backplane with seven screws as shown (see Letter B).
12. Re-attach all cables to the backplane.
13. Reinstall all drives and/or drive blanks into the front drive bay.

Notes:
- All front drive bays must be populated with an SSD or supplied drive blank.
- If the front drives were configured as part of a RAID partition, ensure that all drive I/O cables and drives were reinstalled to the same locations as they were configured before the procedure.

14. Reinstall the system top cover (see Section 6.5.2).
6.13 System Battery Replacement

Required Tools and Supplies

- Compatible CR2032 lithium battery
- Anti-static wrist strap and conductive workbench pad (recommended)

1. Power off the system
2. Remove the system top cover (see Section 6.5.1).
3. If present, remove riser card assembly above the battery location (see Section 6.6).
4. Locate the battery on the server board.
5. Gently press the metal clip as shown to release the battery (see Letter A).
6. Remove the battery from the plastic socket (see Letter B).
7. Dispose of the battery according to local laws.
8. Remove the new lithium battery from its package. Being careful to observe the correct polarity, insert it into the battery socket.
9. Reinstall riser card assemblies if needed (see Section 6.6).
10. Reinstall the system top cover (see Section 6.5.2).
11. Use the <F2> BIOS Setup Utility to restore BIOS Settings and reset the system time and date.
6.14 Server Board Replacement

Required Tools and Supplies

- Intel® Server Board M50FCP2SBSTD spare
- Anti-static wrist strap and conductive workbench pad (recommended)
- Phillips® head screwdriver #2

1. Power off system and remove power cords from each power supply module installed.
2. Disconnect all externally attached cables.
3. Remove the system top cover (see Section 6.5.1).
4. Remove power supply modules (see Section 6.4).
5. Remove all system fans (see Section 6.2).
6. Disconnect all internal cables attached to PCIe add-in cards.
7. (If present) Remove all screws from the chassis back panel (see Figure 34)
8. Remove riser card assemblies (see Section 6.6).
9. If present, remove the OCP add-in card
10. If present, remove all options installed onto the server board, including: TPM Module and M.2 SSDs
11. Remove processors (see Section 6.5.1).
12. Remove all memory modules and DIMM blanks (see Section 6.3).
13. Disconnect all cables attached to connectors on the server board.
14. Detach the two metal air baffles attached to the left and right edges of the server board and carefully lift the air baffles attached on both PSU bays up and away.
15. Remove all fasteners used to secure the server board to the chassis (see Letter ‘A’).
16. Slide the server board towards the front of the chassis to disengage all external connectors from the chassis cut-outs on the chassis back panel.
17. Carefully lift the server board from the chassis and place it into an anti-static bag.
18. Verify that all cables are clear of the board placement target within the chassis.
19. Locate and carefully remove the server board from its anti-static bag. Hold the server board by its edges. Do not touch any components on the server board.

20. Carefully lower the server board into the chassis.
21. Slide the server board towards the back of the chassis until all external connectors on the back edge of the server board are in place with the cut outs on the chassis back panel.
22. Verify that all screw holes align with the chassis standoffs (see Letter A).
23. Secure the server board to the chassis using all the fasteners removed in Step 14. (See Letter B), Tighten to 5 in-lb.
24. Place and secure the right and left metal air baffles to edges of the server board. Tighten to 5 in-lb.
   Lower the air baffles attached on both PSU bays to the server board.
25. Re-attach all cables previously disconnected from the server board.
26. Reinstall processors (see Section 6.5.3).
27. Reinstall memory modules and DIMM blanks (see Section 6.3).
28. Reinstall all options previously removed from the server board.
29. Reinstall riser card assemblies (see Section 6.6).
30. Re-attach all internal cables previously detached from PCIe add-in cards. See Section 3.2 for cable routing.
31. Reinstall all system fans (see Section 6.2).
32. Reinstall power supply modules (see Section 6.4).
33. Reinstall the system top cover (see Section 6.5.2).
Appendix A. Getting Help

Available Intel support options with your Intel Server System:

1. **24x7 support through Intel's support webpage at**

   Information available at the support site includes:
   - Latest BIOS, firmware, drivers, and utilities
   - Product documentation, setup, and service guides
   - Full product specifications, technical advisories, and errata
   - Compatibility documentation for memory, hardware add-in cards, and operating systems
   - Server and chassis accessory parts list for ordering upgrades or spare parts
   - A searchable knowledge base to search for product information throughout the support site

Quick Links:

<table>
<thead>
<tr>
<th>Use the following links for support on Intel Server Boards and Server Systems</th>
<th>Download Center</th>
<th>BIOS Support Page</th>
<th>Troubleshooting Boot Issue</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Use the following links for support on Intel® Data Center Block (DCB) Integrated Systems*</th>
<th>Download Center</th>
<th>Technical Support Documents</th>
<th>Warranty and Support Info</th>
</tr>
</thead>
</table>

2. **If a solution cannot be found at Intel's support site, submit a service request via Intel's online service center at** [https://supporttickets.intel.com/servicecenter?lang=en-US](https://supporttickets.intel.com/servicecenter?lang=en-US). In addition, you can also view previous support requests. (Login required to access previous support requests)

3. **Contact an Intel support representative using one of the support phone numbers available at** [https://www.intel.com/content/www/us/en/support/contact-support.html](https://www.intel.com/content/www/us/en/support/contact-support.html) (charges may apply).


**Note:** The 24x7 support number is available after logging in to the Intel Partner Alliance website.

### Warranty Information

Appendix B. Memory Population Rules

B.1 DDR5 DIMM Population Rules

**Note:** Although mixed DDR5 DRAM DIMM configurations are supported, Intel only performs platform validation on systems that are configured with identical DIMMs installed.

The following memory population rules apply when installing DDR5 DIMMs:

- All DIMMs must be DDR5 DIMMs.
- All DIMMs in a processor socket must have the same number of ranks (unless explicitly specified otherwise)
- Mixing rules:
  - Mixing DDR5 DIMMs of different frequencies and latencies is not supported within or across processors. If a mixed configuration is encountered, the BIOS attempts to operate at the highest common frequency and the lowest latency possible.
  - x4 and x8 width DIMMs cannot be mixed in the same channel or same processor socket.
  - Mixing of DDR5 DIMM types (standard RDIMM, 3DS-RDIMM, 9x4 RDIMM) within or across processors is not supported. This will lead to a Fatal Error Halt during Memory Initialization.
  - Mixing vendors is supported for RDIMMs and 3DS RDIMMs.
  - Ranks mixing is not supported on a channel, except for Standard RDIMM 1 Rank +2 Rank combination, when 16 DIMMS for processor socket is populated.
- For a single DDR5 DIMM in a dual-slot channel, populate slot 1 (blue slot).
- For multiple DDR5 DIMMs per channel:
  - For RDIMM, 3DS-RDIMM, 9x4 RDIMM, always populate DIMMs with higher electrical loading in slot 1 (blue slot) followed by slot 2 (black slot).
- Memory slots associated with a given processor are unavailable if the corresponding processor socket is not populated.
- Processor sockets are self-contained and autonomous. However, all memory subsystem support (such as memory RAS and error management) in the BIOS Setup is applied commonly for each installed processor.
- For best system performance, memory must be installed in all eight channels for each installed processor.
- For best system performance in dual processor configurations, installed DDR5 DIMM type and population for DDR5 DIMMs configured to CPU 1 must match DDR5 DIMM type and population configured to CPU 0.
B.2 Intel® DDR5 DIMM Support Disclaimer

Intel validates, and only supports system configurations, where all installed DDR5 DIMMs have matching “Identical” or “Like” attributes (see following table). A system configured concurrently with DDR5 DIMMs from different vendors are supported by Intel if all other DDR5 “Like” DIMM attributes match.

Intel does not perform system validation testing, nor will it support system configurations, where all populated DDR5 DIMMs do not have matching “Like” DIMM attributes, as listed in the following table. Intel only supports Intel server systems configured with DDR5 DIMMs that have been validated by Intel and are listed on Intel's Tested Memory list for a given Intel server family.

Intel configures and ships fully integrated L9 server systems. All DDR5 DIMMs within an L9 server system as shipped by Intel, are identical. All installed DIMMs have matching attributes as the attributes listed in the “Identical” DDR5 DIMM Attributes column in the following table.

When purchasing more than one integrated L9 server system with the same configuration from Intel, Intel reserves the right to use “Like” DIMMs between server systems. At a minimum, “Like” DIMMS will have matching DIMM attributes as listed in the following table. However, the DIMM model #, revision #, or vendor may be different.

For warranty replacement, Intel will make every effort to ship back an exact match to the one returned. However, Intel may ship back a validated “Like” DIMM. A “Like” DIMM may be from the same vendor but may not be the same revision # or model #, or it may be an Intel validated DIMM from a different vendor. At a minimum, all “Like” DIMMs shipped from Intel will match attributes of the original part according to the definition of “Like” DIMMs in the following table.

Table 4. DDR5 DIMM Attributes Table for “Identical” and “Like” DIMMs

<table>
<thead>
<tr>
<th>Attribute</th>
<th>“Identical” DDR5 DIMM Attributes</th>
<th>“Like” DDR5 DIMM Attributes</th>
<th>Possible DDR5 Attribute Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vendor</td>
<td>Match</td>
<td>May be Different</td>
<td>Memory Vendor Name</td>
</tr>
<tr>
<td>DIMM Part #</td>
<td>Match</td>
<td>May be Different</td>
<td>Memory Vendor Part #</td>
</tr>
<tr>
<td>DIMM Revision #</td>
<td>Match</td>
<td>May be Different</td>
<td>Memory Vendor Part Revision #</td>
</tr>
<tr>
<td>SDRAM Type</td>
<td>Match</td>
<td>Match</td>
<td>DDR5</td>
</tr>
<tr>
<td>DIMM Type</td>
<td>Match</td>
<td>Match</td>
<td>RDIMM, 9x4 RDIMM</td>
</tr>
<tr>
<td>Speed (MT/s)</td>
<td>Match</td>
<td>Match</td>
<td>4000, 4400, 4800</td>
</tr>
<tr>
<td>Voltage</td>
<td>Match</td>
<td>Match</td>
<td>1.1 V</td>
</tr>
<tr>
<td>DIMM Size (GB)</td>
<td>Match</td>
<td>Match</td>
<td>16 GB, 32 GB, 64 GB, 128 GB, 256 GB</td>
</tr>
<tr>
<td>Organization</td>
<td>Match</td>
<td>Match</td>
<td>2Gx80; 4Gx80; 8Gx80; 16Gx80; 32Gx80</td>
</tr>
<tr>
<td>DIMM Rank</td>
<td>Match</td>
<td>Match</td>
<td>1R, 2R, 4R, 8R</td>
</tr>
<tr>
<td>DRAM Width</td>
<td>Match</td>
<td>Match</td>
<td>x4, x8</td>
</tr>
<tr>
<td>DRAM Density</td>
<td>Match</td>
<td>Match</td>
<td>16 Gb</td>
</tr>
</tbody>
</table>
Appendix C. System Status LED Operating States and Definition

The server board includes a bi-color System Status LED. The system status LED on the server board is tied directly to the system status LED on the front panel (if present). This LED indicates the current health of the server system. LED states include solid green, blinking green, solid amber, and blinking amber.

When the server system is powered down (transitions to the DC-off state or S5), the BMC is still on standby power and retains the sensor and front panel status LED state established before the power-down event.

When AC power is first applied to the system, the status LED turns solid amber, and then immediately changes to blinking green to indicate that the BMC is booting. If the BMC boot process completes with no errors, the status LED changes to solid green.

### Table 5. System Status LED State Definitions

<table>
<thead>
<tr>
<th>LED State</th>
<th>System State</th>
<th>BIOS Status Description</th>
</tr>
</thead>
</table>
| Off                  | No AC Power to system                                                                           | • System power is not present.  
• System is in EuP Lot6 off mode.  
| Solid green          | System is operating normally.                                                                  | • System is in S5 soft-off state.  
• System is running (in S0 State) and its status is healthy. The system is not exhibiting any errors. Source power is present, BMC has booted, and manageability functionality is operational.  
• After a BMC reset, and with the chassis ID solid on, the BMC is booting Linux*. Control has been passed from BMC uBoot to BMC Linux*. It is in this state for 10–20 seconds.  
| Blinking green       | System is operating in a degraded state although still functioning, or system is operating in a redundant state but with an impending failure warning. | • Redundancy loss such as fan or power-supply (When Power Cold Redundancy is enabled). Applies only if the associated platform subsystem has redundancy capabilities.  
• Fan warning or failure when the number of fully operational fans is less than the minimum number needed to cool the system.  
• Non-critical threshold crossed temperature (including HSBP temp), voltage, input power to power supply, output current for main power rail from power supply and Processor Thermal Control (Therm Ctrl) sensors.  
• Power supply predictive failure occurred while redundant power supply configuration was present.  
• Unable to use all installed memory (more than 1 DIMM installed).  
• Correctable Errors over a threshold and migrating to a spare DIMM (memory sparing). This situation indicates that the system no longer has spared DIMMs (a redundancy lost condition). Corresponding DIMM LED lit.  
• In mirrored configuration, when memory mirroring takes place and system loses memory redundancy.  
• Battery failure.  
• BMC executing in uBoot. (Indicated by Chassis ID blinking at 3 Hz while Status blinking at 1 Hz). System in degraded state (no manageability). BMC uBoot is running but has not transferred control to BMC Linux*. Server is in this state 6–8 seconds after BMC reset while it pulls the Linux* image into flash.  
• BMC Watchdog has reset the BMC.  
• Power Unit sensor offset for configuration error is asserted.  
• SSD Hot Swap Controller is off-line or degraded.  
| Blinking green and amber alternatively | System is initializing after source power is applied. | • PFR in the process of updating/authenticating/recovering when source power is connected, system firmware being updated.  
• System not ready to take power button event/signal. |
<table>
<thead>
<tr>
<th>LED State</th>
<th>System State</th>
<th>BIOS Status Description</th>
</tr>
</thead>
</table>
| Blinking amber | System is operating in a degraded state with an impending failure warning, although still functioning. System is likely to fail. | - Critical threshold crossed—Voltage, temperature (including HSBP temp), input power to power supply, output current for main power rail from power supply and PROCHOT (Therm Ctrl) sensors.  
- VRD Hot asserted.  
- Minimum number of fans to cool the system not present or failed.  
- Hard drive fault.  
- Power Unit Redundancy sensor—Insufficient resources offset (indicates not enough power supplies present).  
- In non-sparing and non-mirroring mode, if the threshold of correctable errors is crossed within the window.  
- Invalid firmware image detected during boot up or firmware update. |
| Solid amber  | Critical/non-recoverable. System is halted. Fatal alarm—system has failed or shut down. | - Processor CATERR signal asserted.  
- MSID mismatch detected (CATERR also asserts for this case).  
- CPU 0 is missing.  
- Processor Thermal Trip.  
- No power good–power fault.  
- DIMM failure when there is only 1 DIMM present and hence no good memory present.  
- Runtime memory uncorrectable error in non-redundant mode.  
- DIMM Thermal Trip or equivalent.  
- SSB Thermal Trip or equivalent.  
- Processor ERR2 signal asserted.  
- BMC/Video memory test failed. (Chassis ID shows blue/solid-on for this condition.)  
- Both uBoot BMC firmware images are bad. (Chassis ID shows blue/solid-on for this condition.)  
- 240 VA fault.  
- Fatal Error in processor initialization:  
  - Processor family not identical  
  - Processor model not identical  
  - Processor core/thread counts not identical  
  - Processor cache size not identical  
  - Unable to synchronize processor frequency  
  - Unable to synchronize QPI link frequency  
- BMC fail authentication with non-recoverable condition, system hang at T-1; boot PCH only, system hang; PIT failed, system lockdown. |
Appendix D. POST Code Diagnostic LED Decoder

As an aid in troubleshooting a system hang that occurs during a system POST process, the server board includes a bank of eight POST code diagnostic LEDs on the back edge of the server board.

During the system boot process, Memory Reference Code (MRC) and system BIOS execute several memory initialization and platform configuration routines, each of which is assigned a hex POST code number.

As each process is started, the given POST code number is displayed to the POST code diagnostic LEDs on the back edge of the server board.

During a POST system hang, the displayed POST code can be used to identify the last POST routine that was run before the error occurred, helping to isolate the possible cause of the hang condition.

Each POST code is represented by eight LEDs: four green LEDs and four amber LEDs. The POST codes are divided into two nibbles: an upper nibble, and a lower nibble. The upper nibble bits are represented by amber LEDs and the lower nibble bits are represented by green LEDs. If the bit is set, the corresponding LED is lit. If the bit is clear, the corresponding LED is off. For each set of nibble bits, LED 0 represents the least significant bit (LSB) and LED 3 represents the most significant bit (MSB).

Note: Diagnostic LEDs are best read and decoded when viewing the LEDs from the back of the system.

In the following example, the BIOS sends a value of AC to the diagnostic LED decoder. The LEDs are decoded as shown in the following table.

Table 6. POST Progress Code LED Example

<table>
<thead>
<tr>
<th>LEDs</th>
<th>Upper Nibble AMBER LEDs</th>
<th>Lower Nibble GREEN LEDs</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MSB</td>
<td>LED #7</td>
<td>LED #6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8h</td>
<td>4h</td>
</tr>
<tr>
<td>Status</td>
<td>ON</td>
<td>OFF</td>
<td>ON</td>
</tr>
<tr>
<td>Read</td>
<td>Binary</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Value</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 133. Onboard POST Diagnostic LEDs
Upper nibble bits = 1010b = A; Lower nibble bits = 1100b = C; the two Hex Nibble values are combined to create a single ACh POST Progress Code.

D.1 Early POST Memory Initialization MRC Diagnostic Codes

Memory initialization at the beginning of POST includes multiple functions: discovery, channel training, validation that the DIMM population is acceptable and functional, initialization of the IMC and other hardware settings, and initialization of applicable RAS configurations.

The MRC progress codes are displayed to the diagnostic LEDs that show the execution point in the MRC operational path at each step.

<table>
<thead>
<tr>
<th>MRC Progress Code (Hex)</th>
<th>Upper Nibble</th>
<th>Lower Nibble</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>73</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>7E</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>B0</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>B1</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>B2</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>B3</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>B4</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>B5</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>B6</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>B7</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>11</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>77</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>B8</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>B9</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>BA</td>
<td>1</td>
<td>0</td>
<td>1</td>
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<td>BB</td>
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<td>0</td>
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<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>BE</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>BF</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

Should a major memory initialization error occur, preventing the system from booting with data integrity, a beep code is generated, the MRC displays a fatal error code on the diagnostic LEDs, and a system halt command is executed. Fatal MRC error halts do not change the state of the system status LED and they do not get logged as SEL events. Table 8 lists all MRC fatal errors that are displayed to the diagnostic LEDs.

**Note:** Fatal MRC errors display POST error codes that may be the same as BIOS POST progress codes displayed later in the POST process. The fatal MRC codes can be distinguished from the BIOS POST progress codes by the accompanying memory failure beep code of three long beeps as identified in Table 11.
## Table 8. MRC Fatal Error Codes

<table>
<thead>
<tr>
<th>Post Code (Hex)</th>
<th>Upper Nibble</th>
<th>Lower Nibble</th>
<th>Description</th>
</tr>
</thead>
</table>
| E8              | 1 1 1 0      | 1 0 0 0      | No usable memory error  
01h = No memory was detected from SPD read, or invalid config that causes no operable memory.  
02h = Memory DIMMs on all channels of all sockets are inactivated due to hardware memtest error.  
03h = No memory installed. All channels are inactivated. |
| E9              | 1 1 1 0      | 1 0 0 1      | Memory is locked by Intel® TXT and is inaccessible |
| EA              | 1 1 1 0      | 1 0 1 0      | DDR5 channel training error  
01h = Error on read DQ/DQS (Data/Data Strobe) init  
02h = Error on Receive Enable  
03h = Error on Write Leveling  
04h = Error on write DQ/DQS (Data/Data Strobe) |
| EB              | 1 1 1 0      | 1 0 1 1      | Memory test failure  
01h = Software memtest failure.  
02h = Hardware memtest failed. |
| ED              | 1 1 1 0      | 1 1 0 1      | DIMM configuration population error  
01h = Different DIMM types (RDIMM, LRDIMM) are detected installed in the system.  
02h = Violation of DIMM population rules.  
03h = The 3rd DIMM slot cannot be populated when QR DIMMs are installed.  
04h = UDIMMs are not supported.  
05h = Unsupported DIMM Voltage. |
| EF              | 1 1 1 0      | 1 1 1 1      | Indicates a CLTT table structure error |

### D.2 BIOS POST Progress Codes

The following table provides a list of all POST progress codes.

## Table 9. POST Progress Codes

<table>
<thead>
<tr>
<th>Post Code (Hex)</th>
<th>Upper Nibble</th>
<th>Lower Nibble</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security (SEC) Phase</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>01</td>
<td>0 0 0 0</td>
<td>0 0 0 1</td>
<td>First POST code after CPU reset</td>
</tr>
<tr>
<td>02</td>
<td>0 0 0 0</td>
<td>0 0 1 0</td>
<td>Microcode load begin</td>
</tr>
<tr>
<td>03</td>
<td>0 0 0 0</td>
<td>0 0 1 1</td>
<td>CRAM initialization begins</td>
</tr>
<tr>
<td>04</td>
<td>0 0 0 0</td>
<td>0 1 0 0</td>
<td>PEI Cache When Inactivated</td>
</tr>
<tr>
<td>05</td>
<td>0 0 0 0</td>
<td>0 1 0 1</td>
<td>SEC Core At Power On Begin.</td>
</tr>
<tr>
<td>06</td>
<td>0 0 0 0</td>
<td>0 1 1 0</td>
<td>Early CPU initialization during SEC Phase.</td>
</tr>
</tbody>
</table>

<p>| UPI RC (Fully leverage without platform change) |
| A1              | 1 0 1 0      | 0 0 0 1      | Collect info: SBSP, boot mode, reset type, etc. |
| A3              | 1 0 1 0      | 0 0 1 1      | Setup minimum path between SBSP and other sockets |
| A6              | 1 0 1 0      | 0 1 1 0      | Sync up with PBSPs |
| A7              | 1 0 1 0      | 0 1 1 1      | Topology discovery and route calculation |
| A8              | 1 0 1 0      | 1 0 0 0      | Program final route |</p>
<table>
<thead>
<tr>
<th>Post Code (Hex)</th>
<th>Upper Nibble</th>
<th>Lower Nibble</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A9</td>
<td>1 0 1 0</td>
<td>1 0 0 1</td>
<td>Program final IO SAD setting</td>
</tr>
<tr>
<td>AA</td>
<td>1 0 1 0</td>
<td>1 0 1 0</td>
<td>Protocol layer and other uncore settings</td>
</tr>
<tr>
<td>AB</td>
<td>1 0 1 0</td>
<td>1 0 1 1</td>
<td>Transition links to full speed operation</td>
</tr>
<tr>
<td>AE</td>
<td>1 0 1 0</td>
<td>1 1 1 0</td>
<td>Coherency settings</td>
</tr>
<tr>
<td>AF</td>
<td>1 0 1 0</td>
<td>1 1 1 1</td>
<td>KTI initialization done</td>
</tr>
</tbody>
</table>

**Pre-EFI Initialization (PEI) Phase**

<table>
<thead>
<tr>
<th>Post Code (Hex)</th>
<th>Upper Nibble</th>
<th>Lower Nibble</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>0 0 0 1</td>
<td>0 0 0 0</td>
<td>PEI Core</td>
</tr>
<tr>
<td>11</td>
<td>0 0 0 1</td>
<td>0 0 0 1</td>
<td>CPU PEIM</td>
</tr>
<tr>
<td>15</td>
<td>0 0 0 1</td>
<td>0 1 0 1</td>
<td>Platform Type Init</td>
</tr>
<tr>
<td>19</td>
<td>0 0 0 1</td>
<td>1 0 0 1</td>
<td>Platform PEIM Init</td>
</tr>
</tbody>
</table>

**Integrated I/O Progress Codes**

<table>
<thead>
<tr>
<th>Post Code (Hex)</th>
<th>Upper Nibble</th>
<th>Lower Nibble</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>E0</td>
<td>1 1 1 0</td>
<td>0 0 0 0</td>
<td>Integrated I/O Early Init Entry</td>
</tr>
<tr>
<td>E1</td>
<td>1 1 1 0</td>
<td>0 0 0 1</td>
<td>Integrated I/O Pre-link Training</td>
</tr>
<tr>
<td>E2</td>
<td>1 1 1 0</td>
<td>0 1 0</td>
<td>Integrated I/O EQ Programming</td>
</tr>
<tr>
<td>E3</td>
<td>1 1 1 0</td>
<td>0 0 1 1</td>
<td>Integrated I/O Link Training</td>
</tr>
<tr>
<td>E4</td>
<td>1 1 1 0</td>
<td>0 1 0 0</td>
<td>Internal Use</td>
</tr>
<tr>
<td>E5</td>
<td>1 1 1 0</td>
<td>0 1 0 1</td>
<td>Integrated I/O Early Init Exit</td>
</tr>
<tr>
<td>E6</td>
<td>1 1 1 0</td>
<td>0 1 1 0</td>
<td>Integrated I/O Late Init Entry</td>
</tr>
<tr>
<td>E7</td>
<td>1 1 1 0</td>
<td>0 1 1 1</td>
<td>Integrated I/O PCIe Ports Init</td>
</tr>
<tr>
<td>E8</td>
<td>1 1 1 0</td>
<td>1 0 0 0</td>
<td>Integrated I/O IOAPIC init</td>
</tr>
<tr>
<td>E9</td>
<td>1 1 1 0</td>
<td>1 0 0 1</td>
<td>Integrated I/O VTD Init</td>
</tr>
<tr>
<td>EA</td>
<td>1 1 1 0</td>
<td>1 0 1 0</td>
<td>Integrated I/O IOAT Init</td>
</tr>
<tr>
<td>EB</td>
<td>1 1 1 0</td>
<td>1 0 1 1</td>
<td>Integrated I/O DXF Init</td>
</tr>
<tr>
<td>EC</td>
<td>1 1 1 0</td>
<td>1 1 0 0</td>
<td>Integrated I/O NTB Init</td>
</tr>
<tr>
<td>ED</td>
<td>1 1 1 0</td>
<td>1 1 0 1</td>
<td>Integrated I/O Security Init</td>
</tr>
<tr>
<td>EE</td>
<td>1 1 1 0</td>
<td>1 1 1 0</td>
<td>Integrated I/O Late Init Exit</td>
</tr>
<tr>
<td>EF</td>
<td>1 1 1 0</td>
<td>1 1 1 1</td>
<td>Integrated I/O ready to boot</td>
</tr>
</tbody>
</table>

**MRC Progress Codes – At this point the MRC Progress Code sequence is executed.**

<table>
<thead>
<tr>
<th>Post Code (Hex)</th>
<th>Upper Nibble</th>
<th>Lower Nibble</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>31</td>
<td>0 0 1 1</td>
<td>0 0 0 1</td>
<td>Memory Installed</td>
</tr>
<tr>
<td>32</td>
<td>0 0 1 1</td>
<td>0 0 1 0</td>
<td>CPU PEIM (CPU Init)</td>
</tr>
<tr>
<td>33</td>
<td>0 0 1 1</td>
<td>0 0 1 1</td>
<td>CPU PEIM (Cache Init)</td>
</tr>
<tr>
<td>34</td>
<td>0 0 1 1</td>
<td>0 1 0 0</td>
<td>CPU BSP Select</td>
</tr>
<tr>
<td>35</td>
<td>0 0 1 1</td>
<td>0 1 0 1</td>
<td>CPU AP Init</td>
</tr>
<tr>
<td>36</td>
<td>0 0 1 1</td>
<td>0 1 1 0</td>
<td>CPU SMM Init</td>
</tr>
<tr>
<td>4F</td>
<td>0 1 0 0</td>
<td>1 1 1 1</td>
<td>DXE IPL started</td>
</tr>
</tbody>
</table>

**Memory Feature Progress Codes**

<table>
<thead>
<tr>
<th>Post Code (Hex)</th>
<th>Upper Nibble</th>
<th>Lower Nibble</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>1 1 0 0</td>
<td>0 0 0 1</td>
<td>Memory POR check</td>
</tr>
<tr>
<td>C2</td>
<td>1 1 0 0</td>
<td>0 0 1 0</td>
<td>Internal Use</td>
</tr>
<tr>
<td>C3</td>
<td>1 1 0 0</td>
<td>0 0 1 1</td>
<td>Internal Use</td>
</tr>
<tr>
<td>C4</td>
<td>1 1 0 0</td>
<td>0 1 0 0</td>
<td>Internal Use</td>
</tr>
<tr>
<td>C5</td>
<td>1 1 0 0</td>
<td>0 1 0 1</td>
<td>Memory Early Init</td>
</tr>
<tr>
<td>C6</td>
<td>1 1 0 0</td>
<td>0 1 1 0</td>
<td>Display DIMM info in debug mode</td>
</tr>
<tr>
<td>C7</td>
<td>1 1 0 0</td>
<td>0 1 1 1</td>
<td>JEDEC Nvdimm training</td>
</tr>
<tr>
<td>C9</td>
<td>1 1 0 0</td>
<td>1 0 0 1</td>
<td>Setup SVL and Scrambling</td>
</tr>
<tr>
<td>CA</td>
<td>1 1 0 0</td>
<td>1 0 1 0</td>
<td>Internal Use</td>
</tr>
</tbody>
</table>
### Intel® Server System M50FCP1UR System Integration and Service Guide

<table>
<thead>
<tr>
<th>Post Code (Hex)</th>
<th>Upper Nibble</th>
<th>Lower Nibble</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CB</td>
<td>1</td>
<td>1</td>
<td>Check RAS support</td>
</tr>
<tr>
<td>CC</td>
<td>1</td>
<td>1</td>
<td>PMem ADR Init</td>
</tr>
<tr>
<td>CD</td>
<td>1</td>
<td>1</td>
<td>Internal Use</td>
</tr>
<tr>
<td>CE</td>
<td>1</td>
<td>1</td>
<td>Memory Late Init</td>
</tr>
<tr>
<td>CF</td>
<td>1</td>
<td>1</td>
<td>Determine MRC boot mode</td>
</tr>
<tr>
<td>D0</td>
<td>1</td>
<td>1</td>
<td>MKTME Early Init</td>
</tr>
<tr>
<td>D1</td>
<td>1</td>
<td>1</td>
<td>SGX Early Init</td>
</tr>
<tr>
<td>D2</td>
<td>1</td>
<td>1</td>
<td>Memory Margin Test</td>
</tr>
<tr>
<td>D3</td>
<td>1</td>
<td>1</td>
<td>Internal Use</td>
</tr>
<tr>
<td>D5</td>
<td>1</td>
<td>1</td>
<td>Internal Use</td>
</tr>
<tr>
<td>D6</td>
<td>1</td>
<td>1</td>
<td>Offset Training Result</td>
</tr>
</tbody>
</table>

### Driver Execution Environment (DXE) Phase

<table>
<thead>
<tr>
<th>Code</th>
<th>Upper Nibble</th>
<th>Lower Nibble</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
<td>0</td>
<td>1</td>
<td>DXE Core started</td>
</tr>
<tr>
<td>62</td>
<td>0</td>
<td>1</td>
<td>DXE Setup Init</td>
</tr>
<tr>
<td>68</td>
<td>0</td>
<td>1</td>
<td>DXE PCI Host Bridge Init</td>
</tr>
<tr>
<td>69</td>
<td>0</td>
<td>1</td>
<td>DXE NB Init</td>
</tr>
<tr>
<td>6A</td>
<td>0</td>
<td>1</td>
<td>DXE NB SMM Init</td>
</tr>
<tr>
<td>70</td>
<td>0</td>
<td>1</td>
<td>DXE SB Init</td>
</tr>
<tr>
<td>71</td>
<td>0</td>
<td>1</td>
<td>DXE SB SMM Init</td>
</tr>
<tr>
<td>72</td>
<td>0</td>
<td>1</td>
<td>DXE SB devices Init</td>
</tr>
<tr>
<td>78</td>
<td>0</td>
<td>1</td>
<td>DXE ACPI Init</td>
</tr>
<tr>
<td>79</td>
<td>0</td>
<td>1</td>
<td>DXE CSM Init</td>
</tr>
<tr>
<td>7D</td>
<td>0</td>
<td>1</td>
<td>DXE Removable Media Detect</td>
</tr>
<tr>
<td>7E</td>
<td>0</td>
<td>1</td>
<td>DXE Removable Media Detected</td>
</tr>
<tr>
<td>90</td>
<td>1</td>
<td>0</td>
<td>DXE BDS started</td>
</tr>
<tr>
<td>91</td>
<td>1</td>
<td>0</td>
<td>DXE BDS connect drivers</td>
</tr>
<tr>
<td>92</td>
<td>1</td>
<td>0</td>
<td>DXE PCI bus begin</td>
</tr>
<tr>
<td>93</td>
<td>1</td>
<td>0</td>
<td>DXE PCI Bus HPC Init</td>
</tr>
<tr>
<td>94</td>
<td>1</td>
<td>0</td>
<td>DXE PCI Bus enumeration</td>
</tr>
<tr>
<td>95</td>
<td>1</td>
<td>0</td>
<td>DXE PCI Bus resource requested</td>
</tr>
<tr>
<td>96</td>
<td>1</td>
<td>0</td>
<td>DXE PCI Bus assign resource</td>
</tr>
<tr>
<td>97</td>
<td>1</td>
<td>0</td>
<td>DXE CON_OUT connect</td>
</tr>
<tr>
<td>98</td>
<td>1</td>
<td>0</td>
<td>DXE CON_IN connect</td>
</tr>
<tr>
<td>99</td>
<td>1</td>
<td>0</td>
<td>DXE SIO Init</td>
</tr>
<tr>
<td>9A</td>
<td>1</td>
<td>0</td>
<td>DXE USB start</td>
</tr>
<tr>
<td>9B</td>
<td>1</td>
<td>0</td>
<td>DXE USB reset</td>
</tr>
<tr>
<td>9C</td>
<td>1</td>
<td>0</td>
<td>DXE USB detect</td>
</tr>
<tr>
<td>9D</td>
<td>1</td>
<td>0</td>
<td>DXE USB enable</td>
</tr>
<tr>
<td>A1</td>
<td>1</td>
<td>0</td>
<td>DXE IDE begin</td>
</tr>
<tr>
<td>A2</td>
<td>1</td>
<td>0</td>
<td>DXE IDE reset</td>
</tr>
<tr>
<td>A3</td>
<td>1</td>
<td>0</td>
<td>DXE IDE detect</td>
</tr>
<tr>
<td>A4</td>
<td>1</td>
<td>0</td>
<td>DXE IDE enable</td>
</tr>
<tr>
<td>A5</td>
<td>1</td>
<td>0</td>
<td>DXE SCSI begin</td>
</tr>
<tr>
<td>A6</td>
<td>1</td>
<td>0</td>
<td>DXE SCSI reset</td>
</tr>
<tr>
<td>A7</td>
<td>1</td>
<td>0</td>
<td>DXE SCSI detect</td>
</tr>
<tr>
<td>Post Code (Hex)</td>
<td>Upper Nibble</td>
<td>Lower Nibble</td>
<td>Description</td>
</tr>
<tr>
<td>----------------</td>
<td>--------------</td>
<td>--------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>A8</td>
<td>1 0 1 0</td>
<td>1 0 0 0</td>
<td>DXE SCSI enable</td>
</tr>
<tr>
<td>AB</td>
<td>1 0 1 0</td>
<td>1 0 1 1</td>
<td>DXE SETUP start</td>
</tr>
<tr>
<td>AC</td>
<td>1 0 1 0</td>
<td>1 1 0 0</td>
<td>DXE SETUP input wait</td>
</tr>
<tr>
<td>AD</td>
<td>1 0 1 0</td>
<td>1 1 0 1</td>
<td>DXE Ready to Boot</td>
</tr>
<tr>
<td>AE</td>
<td>1 0 1 0</td>
<td>1 1 1 0</td>
<td>DXE Legacy Boot</td>
</tr>
<tr>
<td>AF</td>
<td>1 0 1 0</td>
<td>1 1 1 1</td>
<td>DXE Exit Boot Services</td>
</tr>
<tr>
<td>B0</td>
<td>1 0 1 1</td>
<td>0 0 0 0</td>
<td>RT Set Virtual Address Map Begin</td>
</tr>
<tr>
<td>B1</td>
<td>1 0 1 1</td>
<td>0 0 0 1</td>
<td>RT Set Virtual Address Map End</td>
</tr>
<tr>
<td>B2</td>
<td>1 0 1 1</td>
<td>0 0 1 0</td>
<td>DXE Legacy Option ROM knit</td>
</tr>
<tr>
<td>B3</td>
<td>1 0 1 1</td>
<td>0 0 1 1</td>
<td>DXE Reset system</td>
</tr>
<tr>
<td>B4</td>
<td>1 0 1 1</td>
<td>0 1 0 0</td>
<td>DXE USB Hot plug</td>
</tr>
<tr>
<td>B5</td>
<td>1 0 1 1</td>
<td>0 1 0 1</td>
<td>DXE PCI BUS Hot plug</td>
</tr>
<tr>
<td>B8</td>
<td>1 0 1 1</td>
<td>1 0 0 0</td>
<td>PWRBTN Shutdown</td>
</tr>
<tr>
<td>B9</td>
<td>1 0 1 1</td>
<td>1 0 0 1</td>
<td>SLEEP Shutdown</td>
</tr>
<tr>
<td>C0</td>
<td>1 1 0 0</td>
<td>0 0 1 1</td>
<td>End of DXE</td>
</tr>
<tr>
<td>C7</td>
<td>1 1 0 0</td>
<td>0 1 1 1</td>
<td>DXE ACPI Enable</td>
</tr>
<tr>
<td>0</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
<td>Clear POST Code</td>
</tr>
</tbody>
</table>

**S3 Resume**

<table>
<thead>
<tr>
<th>Post Code (Hex)</th>
<th>Upper Nibble</th>
<th>Lower Nibble</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>E0</td>
<td>1 1 1 0</td>
<td>0 0 0 0</td>
<td>S3 Resume PEIM (S3 started)</td>
</tr>
<tr>
<td>E1</td>
<td>1 1 1 0</td>
<td>0 0 0 1</td>
<td>S3 Resume PEIM (S3 boot script)</td>
</tr>
<tr>
<td>E2</td>
<td>1 1 1 0</td>
<td>0 0 1 0</td>
<td>S3 Resume PEIM (S3 Video Repost)</td>
</tr>
<tr>
<td>E3</td>
<td>1 1 1 0</td>
<td>0 0 1 1</td>
<td>S3 Resume PEIM (S3 OS wake)</td>
</tr>
</tbody>
</table>
Appendix E. POST Code Errors

Most error conditions encountered during POST are reported using POST error codes. These codes represent specific failures, warnings, or information. POST error codes may be displayed in the Error Manager Display screen and are always logged to the System Event Log (SEL). Logged events are available to system management applications, including remote and Out of Band (OOB) management.

There are exception cases in early initialization where system resources are not adequately initialized for handling POST error code reporting. These cases are primarily fatal error conditions resulting from initialization of processors and memory, and they are handed by a diagnostic LED display with a system halt.

Table 10 lists the supported POST error codes. Each error code is assigned an error type that determines the action the BIOS takes when the error is encountered. Error types include minor, major, and fatal. The BIOS action for each is defined as follows:

- **Minor**: An error message may be displayed to the screen or to the BIOS Setup Error Manager and the POST error code is logged to the SEL. The system continues booting in a degraded state. The user may want to replace the erroneous unit. The “POST Error Pause” option setting in the BIOS Setup does not affect this error.

- **Major**: An error message is displayed to the Error Manager screen and an error is logged to the SEL. If the BIOS Setup option “Post Error Pause” is enabled, operator intervention is required to continue booting the system. If the BIOS Setup option “POST Error Pause” is inactivated, the system continues to boot.

  **Note**: For 0048 “Password check failed”, the system halts and then, after the next reset/reboot, displays the error code on the Error Manager screen.

- **Fatal**: If the system cannot boot, POST halts the system and displays the following message:

  Unrecoverable fatal error found. System will not boot until the error is resolved
  Press <F2> to enter setup

  When the <F2> key on the keyboard is pressed, the error message is displayed on the Error Manager screen and an error is logged to the System Event Log (SEL) with the POST error code. The system cannot boot until the error is resolved. The faulty component must be replaced. The “POST Error Pause” option setting in the BIOS Setup does not affect this error.

  **Note**: The POST error codes in the following table are common to all current generation Intel® server platforms. Features present on a given server board/system determine which of the listed error codes are supported.
<table>
<thead>
<tr>
<th>Error Code</th>
<th>Error Message</th>
<th>Action Message</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>0012</td>
<td>System RTC date/time not set</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>0048</td>
<td>Password check failed</td>
<td>Put right password.</td>
<td>Major</td>
</tr>
<tr>
<td>0140</td>
<td>PCI component encountered a PERR error</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>0141</td>
<td>PCI resource conflict</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>0146</td>
<td>PCI out of resources error</td>
<td>Enable MemoryMapped I/O above 4 GB item at SETUP to use 64-bit MMIO.</td>
<td>Major</td>
</tr>
<tr>
<td>0191</td>
<td>Processor core/thread count mismatch detected</td>
<td>Use identical CPU type.</td>
<td>Fatal</td>
</tr>
<tr>
<td>0192</td>
<td>Processor cache size mismatch detected</td>
<td>Use identical CPU type.</td>
<td>Fatal</td>
</tr>
<tr>
<td>0194</td>
<td>Processor family mismatch detected</td>
<td>Use identical CPU type.</td>
<td>Fatal</td>
</tr>
<tr>
<td>0195</td>
<td>Processor Intel(R) UPI link frequencies unable to synchronize</td>
<td></td>
<td>Fatal</td>
</tr>
<tr>
<td>0196</td>
<td>Processor model mismatch detected</td>
<td>Use identical CPU type.</td>
<td>Fatal</td>
</tr>
<tr>
<td>0197</td>
<td>Processor frequencies unable to synchronize</td>
<td>Use identical CPU type.</td>
<td>Fatal</td>
</tr>
<tr>
<td>5220</td>
<td>BIOS Settings reset to default settings</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>5221</td>
<td>Passwords cleared by jumper</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>5224</td>
<td>Password clear jumper is Set</td>
<td>Recommend reminding user to install BIOS password as BIOS admin password is the primary keys for several BIOS security features.</td>
<td>Major</td>
</tr>
<tr>
<td>8130</td>
<td>CPU 0 inactivated</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>8131</td>
<td>CPU 1 inactivated</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>8160</td>
<td>CPU 0 unable to apply microcode update</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>8161</td>
<td>CPU 1 unable to apply microcode update</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>8170</td>
<td>CPU 0 failed Self-Test (BIST)</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>8171</td>
<td>CPU 1 failed Self-Test (BIST)</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>8180</td>
<td>CPU 0 microcode update not found</td>
<td></td>
<td>Minor</td>
</tr>
<tr>
<td>8181</td>
<td>CPU 1 microcode update not found</td>
<td></td>
<td>Minor</td>
</tr>
<tr>
<td>8190</td>
<td>Watchdog timer failed on last boot</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>8198</td>
<td>OS boot watchdog timer failure</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>8300</td>
<td>Baseboard Management Controller failed self-test.</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>8305</td>
<td>Hot Swap Controller failure</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>83A0</td>
<td>Management Engine (ME) failed self-test.</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>83A1</td>
<td>Management Engine (ME) Failed to respond.</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>84F2</td>
<td>Baseboard management controller failed to respond</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>84F3</td>
<td>Baseboard Management Controller in Update Mode.</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>84F4</td>
<td>Baseboard Management Controller Sensor Data Record empty.</td>
<td>Update right SDR.</td>
<td>Major</td>
</tr>
<tr>
<td>84FF</td>
<td>System Event Log full</td>
<td>Clear SEL through EWS or SELVIEW utility.</td>
<td>Minor</td>
</tr>
<tr>
<td>85FC</td>
<td>Memory component could not be configured in the selected RAS mode</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>8501</td>
<td>Memory Population Error</td>
<td>Plug DIMM at right population.</td>
<td>Major</td>
</tr>
<tr>
<td>8502</td>
<td>PMem invalid DIMM population found on the system.</td>
<td>Populate valid POR PMem DIMM population.</td>
<td>Major</td>
</tr>
<tr>
<td>8520</td>
<td>Memory failed test/initialization CPU0_DIMM_A1</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>8521</td>
<td>Memory failed test/initialization CPU0_DIMM_A2</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>8522</td>
<td>Memory failed test/initialization CPU0_DIMM_A3</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>Error Code</td>
<td>Error Message</td>
<td>Action Message</td>
<td>Type</td>
</tr>
<tr>
<td>------------</td>
<td>--------------------------------------------</td>
<td>----------------------------------------------</td>
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</tr>
<tr>
<td>8523</td>
<td>Memory failed test/initialization CPU0_DIMM_B1</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>8524</td>
<td>Memory failed test/initialization CPU0_DIMM_B2</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>8525</td>
<td>Memory failed test/initialization CPU0_DIMM_B3</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>8526</td>
<td>Memory failed test/initialization CPU0_DIMM_C1</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>8527</td>
<td>Memory failed test/initialization CPU0_DIMM_C2</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>8528</td>
<td>Memory failed test/initialization CPU0_DIMM_C3</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>8529</td>
<td>Memory failed test/initialization CPU0_DIMM_D1</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>852A</td>
<td>Memory failed test/initialization CPU0_DIMM_D2</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>852B</td>
<td>Memory failed test/initialization CPU0_DIMM_D3</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>852C</td>
<td>Memory failed test/initialization CPU0_DIMM_E1</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>852D</td>
<td>Memory failed test/initialization CPU0_DIMM_E2</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>852E</td>
<td>Memory failed test/initialization CPU0_DIMM_E3</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>852F</td>
<td>Memory failed test/initialization CPU0_DIMM_F1</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>8530</td>
<td>Memory failed test/initialization CPU0_DIMM_F2</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>8531</td>
<td>Memory failed test/initialization CPU0_DIMM_F3</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>8532</td>
<td>Memory failed test/initialization CPU0_DIMM_G1</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>8533</td>
<td>Memory failed test/initialization CPU0_DIMM_G2</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>8534</td>
<td>Memory failed test/initialization CPU0_DIMM_G3</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>8535</td>
<td>Memory failed test/initialization CPU0_DIMM_H1</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>8536</td>
<td>Memory failed test/initialization CPU0_DIMM_H2</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>8537</td>
<td>Memory failed test/initialization CPU0_DIMM_H3</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>8538</td>
<td>Memory failed test/initialization CPU1_DIMM_A1</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>8539</td>
<td>Memory failed test/initialization CPU1_DIMM_A2</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>853A</td>
<td>Memory failed test/initialization CPU1_DIMM_A3</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>853B</td>
<td>Memory failed test/initialization CPU1_DIMM_B1</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>853C</td>
<td>Memory failed test/initialization CPU1_DIMM_B2</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>853D</td>
<td>Memory failed test/initialization CPU1_DIMM_B3</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>853E</td>
<td>Memory failed test/initialization CPU1_DIMM_C1</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>853F</td>
<td>Memory failed test/initialization CPU1_DIMM_C2</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>8540</td>
<td>Memory inactivated.CPU0_DIMM_A1</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>8541</td>
<td>Memory inactivated.CPU0_DIMM_A2</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>8542</td>
<td>Memory inactivated.CPU0_DIMM_A3</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>8543</td>
<td>Memory inactivated.CPU0_DIMM_B1</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>8544</td>
<td>Memory inactivated.CPU0_DIMM_B2</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>8545</td>
<td>Memory inactivated.CPU0_DIMM_B3</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>8546</td>
<td>Memory inactivated.CPU0_DIMM_C1</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>8547</td>
<td>Memory inactivated.CPU0_DIMM_C2</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>8548</td>
<td>Memory inactivated.CPU0_DIMM_C3</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>8549</td>
<td>Memory inactivated.CPU0_DIMM_D1</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>854A</td>
<td>Memory inactivated.CPU0_DIMM_D2</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>854B</td>
<td>Memory inactivated.CPU0_DIMM_D3</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>854C</td>
<td>Memory inactivated.CPU0_DIMM_E1</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>854D</td>
<td>Memory inactivated.CPU0_DIMM_E2</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>854E</td>
<td>Memory inactivated.CPU0_DIMM_E3</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>854F</td>
<td>Memory inactivated.CPU0_DIMM_F1</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>8550</td>
<td>Memory inactivated.CPU0_DIMM_F2</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>Error Code</td>
<td>Error Message</td>
<td>Action Message</td>
<td>Type</td>
</tr>
<tr>
<td>------------</td>
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</tr>
<tr>
<td>8551</td>
<td>Memory inactivated.CPU0_DIMM_F3</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>8552</td>
<td>Memory inactivated.CPU0_DIMM_G1</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>8553</td>
<td>Memory inactivated.CPU0_DIMM_G2</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>8554</td>
<td>Memory inactivated.CPU0_DIMM_G3</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>8555</td>
<td>Memory inactivated.CPU0_DIMM_H1</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>8556</td>
<td>Memory inactivated.CPU0_DIMM_H2</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>8557</td>
<td>Memory inactivated.CPU0_DIMM_H3</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>8558</td>
<td>Memory inactivated.CPU1_DIMM_A1</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>8559</td>
<td>Memory inactivated.CPU1_DIMM_A2</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>855A</td>
<td>Memory inactivated.CPU1_DIMM_A3</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>855B</td>
<td>Memory inactivated.CPU1_DIMM_B1</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>855C</td>
<td>Memory inactivated.CPU1_DIMM_B2</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>855D</td>
<td>Memory inactivated.CPU1_DIMM_B3</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>855E</td>
<td>Memory inactivated.CPU1_DIMM_C1</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>855F (Go to 85D0)</td>
<td>Memory inactivated.CPU1_DIMM_C2</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>8560</td>
<td>Memory encountered a Serial Presence Detection (SPD) failure.CPU0_DIMM_A1</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>8561</td>
<td>Memory encountered a Serial Presence Detection (SPD) failure.CPU0_DIMM_A2</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>8562</td>
<td>Memory encountered a Serial Presence Detection (SPD) failure.CPU0_DIMM_A3</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>8563</td>
<td>Memory encountered a Serial Presence Detection (SPD) failure.CPU0_DIMM_B1</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>8564</td>
<td>Memory encountered a Serial Presence Detection (SPD) failure.CPU0_DIMM_B2</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>8565</td>
<td>Memory encountered a Serial Presence Detection (SPD) failure.CPU0_DIMM_B3</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>8566</td>
<td>Memory encountered a Serial Presence Detection (SPD) failure.CPU0_DIMM_C1</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>8567</td>
<td>Memory encountered a Serial Presence Detection (SPD) failure.CPU0_DIMM_C2</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>8568</td>
<td>Memory encountered a Serial Presence Detection (SPD) failure.CPU0_DIMM_C3</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>8569</td>
<td>Memory encountered a Serial Presence Detection (SPD) failure.CPU0_DIMM_D1</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>856A</td>
<td>Memory encountered a Serial Presence Detection (SPD) failure.CPU0_DIMM_D2</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>856B</td>
<td>Memory encountered a Serial Presence Detection (SPD) failure.CPU0_DIMM_D3</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>856C</td>
<td>Memory encountered a Serial Presence Detection (SPD) failure.CPU0_DIMM_E1</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>856D</td>
<td>Memory encountered a Serial Presence Detection (SPD) failure.CPU0_DIMM_E2</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>856E</td>
<td>Memory encountered a Serial Presence Detection (SPD) failure.CPU0_DIMM_E3</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>856F</td>
<td>Memory encountered a Serial Presence Detection (SPD) failure.CPU0_DIMM_F1</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>8570</td>
<td>Memory encountered a Serial Presence Detection (SPD) failure.CPU0_DIMM_F2</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>Error Code</td>
<td>Error Message</td>
<td>Action Message</td>
<td>Type</td>
</tr>
<tr>
<td>------------</td>
<td>-------------------------------------------------------------------------------</td>
<td>-------------------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>8571</td>
<td>Memory encountered a Serial Presence Detection (SPD) failure.CPU0_DIMM_F3</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>8572</td>
<td>Memory encountered a Serial Presence Detection (SPD) failure.CPU0_DIMM_G1</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>8573</td>
<td>Memory encountered a Serial Presence Detection (SPD) failure.CPU0_DIMM_G2</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>8574</td>
<td>Memory encountered a Serial Presence Detection (SPD) failure.CPU0_DIMM_G3</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>8575</td>
<td>Memory encountered a Serial Presence Detection (SPD) failure.CPU0_DIMM_H1</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>8576</td>
<td>Memory encountered a Serial Presence Detection (SPD) failure.CPU0_DIMM_H2</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>8577</td>
<td>Memory encountered a Serial Presence Detection (SPD) failure.CPU0_DIMM_H3</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>8578</td>
<td>Memory encountered a Serial Presence Detection (SPD) failure.CPU1_DIMM_A1</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>8579</td>
<td>Memory encountered a Serial Presence Detection (SPD) failure.CPU1_DIMM_A2</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>857A</td>
<td>Memory encountered a Serial Presence Detection (SPD) failure.CPU1_DIMM_A3</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>857B</td>
<td>Memory encountered a Serial Presence Detection (SPD) failure.CPU1_DIMM_B1</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>857C</td>
<td>Memory encountered a Serial Presence Detection (SPD) failure.CPU1_DIMM_B2</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>857D</td>
<td>Memory encountered a Serial Presence Detection (SPD) failure.CPU1_DIMM_B3</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>857E</td>
<td>Memory encountered a Serial Presence Detection (SPD) failure.CPU1_DIMM_C1</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>857F</td>
<td>Memory encountered a Serial Presence Detection (SPD) failure.CPU1_DIMM_C2</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>85C0</td>
<td>Memory failed test/initialization CPU1_DIMM_C3</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>85C1</td>
<td>Memory failed test/initialization CPU1_DIMM_D1</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>85C2</td>
<td>Memory failed test/initialization CPU1_DIMM_D2</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>85C3</td>
<td>Memory failed test/initialization CPU1_DIMM_D3</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>85C4</td>
<td>Memory failed test/initialization CPU1_DIMM_E1</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>85C5</td>
<td>Memory failed test/initialization CPU1_DIMM_E2</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>85C6</td>
<td>Memory failed test/initialization CPU1_DIMM_E3</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>85C7</td>
<td>Memory failed test/initialization CPU1_DIMM_F1</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>85C8</td>
<td>Memory failed test/initialization CPU1_DIMM_F2</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>85C9</td>
<td>Memory failed test/initialization CPU1_DIMM_F3</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>85CA</td>
<td>Memory failed test/initialization CPU1_DIMM_G1</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>85CB</td>
<td>Memory failed test/initialization CPU1_DIMM_G2</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>85CC</td>
<td>Memory failed test/initialization CPU1_DIMM_G3</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>85CD</td>
<td>Memory failed test/initialization CPU1_DIMM_H1</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>85CE</td>
<td>Memory failed test/initialization CPU1_DIMM_H2</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>85CF</td>
<td>Memory failed test/initialization CPU1_DIMM_H3</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>85D0</td>
<td>Memory inactivated.CPU1_DIMM_C3</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>85D1</td>
<td>Memory inactivated.CPU1_DIMM_D1</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>85D2</td>
<td>Memory inactivated.CPU1_DIMM_D2</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>85D3</td>
<td>Memory inactivated.CPU1_DIMM_D3</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>Error Code</td>
<td>Error Message</td>
<td>Action Message</td>
<td>Type</td>
</tr>
<tr>
<td>------------</td>
<td>---------------</td>
<td>----------------</td>
<td>------</td>
</tr>
<tr>
<td>85D4</td>
<td>Memory inactive.CPU1_DIMM_E1</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>85D5</td>
<td>Memory inactive.CPU1_DIMM_E2</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>85D6</td>
<td>Memory inactive.CPU1_DIMM_E3</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>85D7</td>
<td>Memory inactive.CPU1_DIMM_F1</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>85D8</td>
<td>Memory inactive.CPU1_DIMM_F2</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>85D9</td>
<td>Memory inactive.CPU1_DIMM_F3</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>85DA</td>
<td>Memory inactive.CPU1_DIMM_G1</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>85DB</td>
<td>Memory inactive.CPU1_DIMM_G2</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>85DC</td>
<td>Memory inactive.CPU1_DIMM_G3</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>85DD</td>
<td>Memory inactive.CPU1_DIMM_H1</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>85DE</td>
<td>Memory inactive.CPU1_DIMM_H2</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>85DF</td>
<td>Memory inactive.CPU1_DIMM_H3</td>
<td>Remove the inactivated DIMM.</td>
<td>Major</td>
</tr>
<tr>
<td>85E0</td>
<td>Memory encountered a Serial Presence Detection(SPD) failure.CPU1_DIMM_C3</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>85E1</td>
<td>Memory encountered a Serial Presence Detection (SPD) failure. CPU1_DIMM_D1</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>85E2</td>
<td>Memory encountered a Serial Presence Detection (SPD) failure.CPU1_DIMM_D2</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>85E3</td>
<td>Memory encountered a Serial Presence Detection(SPD) failure.CPU1_DIMM_D3</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>85E4</td>
<td>Memory encountered a Serial Presence Detection(SPD) failure.CPU1_DIMM_E1</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>85E5</td>
<td>Memory encountered a Serial Presence Detection(SPD) failure.CPU1_DIMM_E2</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>85E6</td>
<td>Memory encountered a Serial Presence Detection(SPD) failure.CPU1_DIMM_E3</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>85E7</td>
<td>Memory encountered a Serial Presence Detection (SPD) failure.CPU1_DIMM_F1</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>85E8</td>
<td>Memory encountered a Serial Presence Detection(SPD) failure.CPU1_DIMM_F2</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>85E9</td>
<td>Memory encountered a Serial Presence Detection(SPD) failure.CPU1_DIMM_F3</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>85EA</td>
<td>Memory encountered a Serial Presence Detection(SPD) failure.CPU1_DIMM_G1</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>85EB</td>
<td>Memory encountered a Serial Presence Detection (SPD) failure. CPU1_DIMM_G2</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>85EC</td>
<td>Memory encountered a Serial Presence Detection(SPD) failure.CPU1_DIMM_G3</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>85ED</td>
<td>Memory encountered a Serial Presence Detection(SPD) failure.CPU1_DIMM_H1</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>85EE</td>
<td>Memory encountered a Serial Presence Detection(SPD) failure.CPU1_DIMM_H2</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>85EF</td>
<td>Memory encountered a Serial Presence Detection(SPD) failure.CPU1_DIMM_H3</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>8604</td>
<td>POST Reclaim of non-critical NVRAM variables</td>
<td></td>
<td>Minor</td>
</tr>
<tr>
<td>8605</td>
<td>BIOS Settings are corrupted</td>
<td></td>
<td>Major</td>
</tr>
<tr>
<td>8606</td>
<td>NVRAM variable space was corrupted and has been reinitialized</td>
<td></td>
<td>Major</td>
</tr>
</tbody>
</table>
### E.1 POST Error Beep Codes

The following table lists the POST error beep codes. Before system video initialization, the BIOS uses these beep codes to inform users on error conditions. The beep code is followed by a user-visible code on the POST progress LEDs.

<table>
<thead>
<tr>
<th>Beeps</th>
<th>Error Message</th>
<th>POST Progress Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 short</td>
<td>Memory error</td>
<td>Multiple</td>
<td>System halted because a fatal error related to the memory was detected.</td>
</tr>
<tr>
<td>3 long and 1 short</td>
<td>CPU mismatch error</td>
<td>E5, E6</td>
<td>System halted because a fatal error related to the CPU family/core/cache mismatch was detected.</td>
</tr>
</tbody>
</table>

The integrated BMC may generate beep codes upon detection of failure conditions. Beep codes are sounded each time that the problem is discovered, such as on each power-up attempt, but are not sounded continuously. Codes that are common across all Intel server boards and systems that use same generation chipset are listed in the following table. Each digit in the code is represented by a sequence of beeps whose count is equal to the digit.

<table>
<thead>
<tr>
<th>Code</th>
<th>Reason for Beep</th>
<th>Associated Sensors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-5-1-2</td>
<td>VR Watchdog Timer sensor assertion.</td>
<td>VR Watchdog Timer.</td>
</tr>
<tr>
<td>1-5-1-4</td>
<td>A PSU reports a failure, or the BMC detects the presence of a PSU model that is incompatible with one or more other PSUs in the system.</td>
<td>PS Status.</td>
</tr>
<tr>
<td>1-5-2-1</td>
<td>No CPUs installed or the first CPU socket is empty.</td>
<td>CPU Missing sensor.</td>
</tr>
<tr>
<td>1-5-2-2</td>
<td>CPU CAT Error (IERR) assertion.</td>
<td>CPU Status sensor.</td>
</tr>
<tr>
<td>1-5-2-3</td>
<td>CPU ERR2 timeout assertion.</td>
<td>CPU ERR2 Timeout sensor.</td>
</tr>
<tr>
<td>1-5-2-4</td>
<td>CPU/VR mismatch.</td>
<td>CPU Status sensor (configuration error offset).</td>
</tr>
<tr>
<td>1-5-2-5</td>
<td>CPU population error.</td>
<td>CPU 0 Status sensor.</td>
</tr>
<tr>
<td>1-5-4-2</td>
<td>Power fault: DC power is unexpectedly lost (power good dropout).</td>
<td>Power Unit – Power unit failure offset.</td>
</tr>
<tr>
<td>1-5-4-4</td>
<td>Power control fault (power good assertion timeout).</td>
<td>Power Unit – Soft power control failure offset.</td>
</tr>
</tbody>
</table>
E.2  Processor Initialization Error Summary

The following table describes mixed processor conditions and actions for all Intel® server boards and Intel® server systems designed with the Intel® Xeon® Scalable processor family architecture. The errors fall into one of the following categories:

- **Fatal**: The system halts with a halt error code on the diagnostic LEDs and a corresponding sequence consisting of three long beeps and one short beep is sent to the POST Error Code LED. The system cannot boot unless the error is resolved. The faulty component must be replaced.
- **Major**: If the BIOS Setup option “POST Error Pause” is enabled, the system goes directly to the BIOS Setup Error Manager to display the error and logs the POST error code to SEL. User intervention is required to continue booting the system. If the BIOS Setup option “POST Error Pause” is disabled, the system continues to boot and no prompt for the error is given, although the POST error code is logged to the BIOS Setup Error Manager and to the SEL.
- **Minor**: An error message may be displayed to the screen or to the BIOS Setup Error Manager screen and the POST error code is logged to the SEL. The system continues booting in a degraded state. The user may want to replace the erroneous unit. The POST Error Pause option setting in the BIOS setup utility does not affect this error.

<table>
<thead>
<tr>
<th>Error</th>
<th>Severity</th>
<th>System Action when BIOS Detects the Error Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor family not identical</td>
<td>Fatal</td>
<td>Halts with error code &quot;0xE5&quot; on the diagnostic LED. Sends three long beeps and one short beep to the POST Error LED. Does not boot until the fault condition is remediated.</td>
</tr>
<tr>
<td>Processor model not identical</td>
<td>Fatal</td>
<td>Halts with error code &quot;0xE5&quot; on the diagnostic LED. Sends three long beeps and one short beep to the POST Error LED. Does not boot until the fault condition is remediated.</td>
</tr>
<tr>
<td>Processor cache or home agent not identical</td>
<td>Fatal</td>
<td>Halts with error code &quot;0xE5&quot; on the diagnostic LED. Sends three long beeps and one short beep to the POST Error LED. Does not boot until the fault condition is remediated.</td>
</tr>
<tr>
<td>Processor frequency (speed) not identical</td>
<td>Fatal</td>
<td>Halts with error code &quot;0xE5&quot; on the diagnostic LED. Sends three long beeps and one short beep to the POST Error LED. Does not boot until the fault condition is remediated.</td>
</tr>
<tr>
<td>Processor Intel® UPI link frequencies not identical</td>
<td>Fatal</td>
<td>Halts with error code &quot;0xE5&quot; on the diagnostic LED. Sends three long beeps and one short beep to the POST Error LED. Does not boot until the fault condition is remediated.</td>
</tr>
<tr>
<td>Processor microcode update failed</td>
<td>Major</td>
<td>Logs the POST error code “81 6x” into the SEL. If the “POST Error Pause” is enabled in the BIOS Setup, loads the BIOS Error Manager to present error message “816x: Processor 0x unable to apply microcode update” on the screen. If the “POST Error Pause” is disabled in the BIOS Setup continues to boot in a degraded state.</td>
</tr>
<tr>
<td>Processor microcode update missing</td>
<td>Minor</td>
<td>Logs the POST error code “81 8x” into the SEL. The system continues to boot in a degraded state, regardless of the “POST Error Pause” setting in the BIOS setup. The Error Manager in BIOS Setup will present the message “818x: Processor microcode update not found”</td>
</tr>
</tbody>
</table>
Appendix F. System Packaging Assembly Instructions

The original Intel packaging, in which the server system is delivered, is designed to provide protection to a fully configured system and was tested to meet ISTA (International Safe Transit Association) Test Procedure 3A (2008). The packaging was also designed to be re-used for shipment to its final destination after system integration has been completed.

The original packaging includes two layers of boxes—an inner box and the outer shipping box, and various protective inner packaging components. The boxes and packaging components are designed to function together as a protective packaging system. When reused, all the original packaging material must be used, including both boxes and each inner packaging component. In addition, all inner packaging components MUST be reinstalled in the proper location to ensure adequate protection of the system for subsequent shipment.

Note: The design of the inner packaging components does not prevent improper placement within the packaging assembly. Only one correct packaging assembly allows the package to meet the ISTA (International Safe Transit Association) Test Procedure 3A (2008) limits.

Failure to follow the specified packaging assembly instructions may result in damage to the system during shipment.

1. Open the outer box (iPN K65051-001). Fold the flap slightly to avoid cracks on the corners. Place the taped inner box (iPN K65084-001) into the outer box. See the following figure.

Caution: No cracks on the corners are permitted.
2. Place the front cushion (iPN K65031-001) on the left end of the inner box. Place the rear cushion (K65006-001) on the right end of the inner box. Then, place bottom foam K75566-001 in the middle. See the following figure.

3. Pack the server system with red EPE sheet (iPN K58342-001). See the following figure.

4. Pack the system wrapped with EPE sheet in the EPE bag. Then, place the system on the bottom foam (see the following figure). Place the top front foam (iPN K65046-001) on the left and the top rear foam (iPN K65037-001) on the right.
5. Place the accessory kit box (iPN H49469-001) in the center foam cushion. Place the extension rails in the two narrow foam cavities. See the following figure.

6. Close the inner box.

7. Close the outer box. Seal the entire package with tape as shown in the following figure.
WARNING: English (US)

The power supply in this product contains no user-serviceable parts. There may be more than one supply in this product. Refer servicing only to qualified personnel.

Do not attempt to modify or use the supplied AC power cord if it is not the exact type required. A product with more than one power supply will have a separate AC power cord for each supply.

The power button on the system does not turn off system AC power. To remove AC power from the system, you must unplug each AC power cord from the electrical outlet or power supply.

The power cord is considered the disconnect device to the main (AC) power. The socket outlet that the system plugs into, shall be installed near the equipment and shall be easily accessible.

SAFETY STEPS: Whenever you remove the chassis covers to access the inside of the system, follow these steps:

1. Turn off all peripheral devices connected to the system.
2. Turn off the system by pressing the power button.
3. Unplug all AC power cords from the system or from electrical outlets.
4. Label and disconnect all cables connected to I/O connectors or ports on the back of the system.
5. Provide some electrostatic discharge (ESD) protection by wearing an antistatic wrist strap attached to chassis ground of the system—any unpainted metal surface—when handling components.
6. Do not operate the system with the chassis covers removed.

After you have completed the six SAFETY steps above, you can remove the system covers. To do this:

1. Unlock and remove the padlock from the back of the system if a padlock has been installed.
2. Remove and save all screws from the covers.
3. Remove the covers.
For proper cooling and airflow, always reinstall the chassis covers before turning on the system. Operating the system without the covers in place can damage system parts. To install the covers:

1. Check first to make sure you have not left loose tools or parts inside the system.
2. Check that cables, add-in boards, and other components are properly installed.
3. Attach the covers to the chassis with the screws removed earlier and tighten them firmly.
4. Insert and lock the padlock to the system to prevent unauthorized access inside the system.
5. Connect all external cables and the AC power cords to the system.

A microprocessor and heat sink may be hot if the system has been running. Also, there may be sharp pins and edges on some board and chassis parts. Contact should be made with care. Consider wearing protective gloves.

Danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the equipment manufacturer. Dispose of used batteries according to manufacturer's instructions.

The system is designed to operate in a typical office environment. Choose a site that is:

- Clean and free of airborne particles (other than normal room dust).
- Well ventilated and away from sources of heat including direct sunlight.
- Away from sources of vibration or physical shock.
- Isolated from strong electromagnetic fields produced by electrical devices.
- In regions that are susceptible to electrical storms, we recommend you plug your system into a surge suppressor and disconnect telecommunication lines to your modem during an electrical storm.
- Provided with a properly grounded electrical outlet.
- Provided with sufficient space to access the power supply cords, because they serve as the product's main power disconnect.
ОСТОРОЖНО: русский

Блок питания данного изделия не содержит деталей, подлежащих обслуживанию пользователем. В этом изделии может быть несколько блоков питания. Обслуживание должно выполняться только квалифицированным персоналом.

Не модифицируйте и не используйте прилагаемый кабель питания, если он не соответствует требуемому типу. Если в устройстве несколько блоков питания, то к каждому блоку питания прилагается отдельный кабель питания.

При нажатии кнопки питания не отключается питание системы от электросети. Чтобы отключить подачу питания переменного тока в систему, необходимо отсоединить все кабели питания от электрической розетки или блока питания.

Кабель питания считается размыкателем питания переменного тока. Электрическая розетка, к которой подключается система, должна находиться рядом с оборудованием и быть легко доступной.

ИНСТРУКЦИИ ПО ТЕХНИКЕ БЕЗОПАСНОСТИ. Каждый раз перед снятием крышек корпуса для доступа к внутренней части системы выполняйте следующие действия:
1. Выключите все периферийные устройства, подключенные к системе.
2. Выключите систему, нажав кнопку питания.
3. Отсоедините все кабели питания от системы или электрических розеток.
4. Промаркируйте и отсоедините все кабели, подключенные к разъемам или портам ввода/вывода на задней панели системы.
5. Для обеспечения защиты от электростатического разряда при работе с компонентами надевайте антистатический браслет, прикрепленный к заземленной части корпуса системы (любой неокрашенной металлической поверхности).
6. Запрещается работать с системой, когда крышки корпуса сняты.

Крышки корпуса системы можно снимать, когда выполнены все шесть описанных выше мер безопасности. Для этого:
1. Откройте и снимите навесной замок (если имеется) с задней части системы.
2. Выверните все винты с крышек и сохраните их.
3. Снимите крышки.

(продолжение)
ОСТОРОЖНО: русский (продолжение)

Для обеспечения надлежащего охлаждения и воздушного потока всегда устанавливайте на место крышки корпуса перед включением системы. Работа системы без установленных крышек может привести к повреждению компонентов системы. Чтобы установить крышки, выполните следующие действия:
1. Сначала проверьте, не осталось ли в системе незакрепленных инструментов или деталей.
2. Убедитесь, что кабели, платы расширения и другие компоненты установлены правильно.
3. Закрепите крышки на корпусе, завернув и надежно затянув винты, снятые ранее.
4. Установите и закройте навесной замок для предотвращения несанкционированного доступа внутрь системы.
5. Подключите к системе все внешние кабели и кабели питания.

Микропроцессор и теплоотвод могут нагреваться во время работы системы. На некоторых деталях платы и корпуса могут быть острые выступы и кромки. Соблюдайте осторожность. Рекомендуется использовать защитные перчатки.

В случае неправильной замены аккумулятора существует опасность взрыва. При замене используйте только те же или эквивалентные модели аккумуляторов, рекомендованные производителем оборудования. Утилизируйте использованные аккумуляторы в соответствии с инструкциями производителя.

Система предназначена для работы в обычной офисной среде. Место установки системы должно соответствовать следующим требованиям:
- Помещение должно быть чистым, в воздухе не должно быть взвешенных частиц (кроме обычной пыли).
- Место установки должно хорошо вентилироваться и находиться вдали от источников тепла (включая прямой солнечный свет).
- Место установки должно находиться вдали от источников вибрации или механических ударов.
- Место установки должно быть изолировано от сильных электромагнитных полей, создаваемых электрическими устройствами.
- В регионах, где часто бывает гроза, рекомендуется подключать систему к сетевому фильтру и отключать телекоммуникационные линии от модема во время грозы.
- В помещении должна быть правильно заземленная электрическая розетка.
- Должен быть оставлен достаточный зазор для доступа к кабелям питания, которые служат размыкателем электропитания системы.
УВАГА! Українська

Джерело живлення в цьому виробі не містить жодних частин, які користувачі могли б обслуговувати самостійно. Цей виріб може містити більше одного джерела живлення. Обслуговувати його може виключно кваліфікований персонал.

Не намагайтеся модифікувати шнур живлення змінного струму з комплекту або користуватися ним, якщо він не відповідає потрібному типу. Виріб із джерелами живлення більше одного має окремі шнури живлення змінного струму для кожного джерела.

Кнопка живлення на системі не вимикає живлення змінного струму системи. Щоб позбавити систему змінного струму, слід вийняти всі шнури живлення змінного струму зі стінних розеток або джерел живлення. Вважається, що шнур(и) живлення є пристроями вимкнення основного живлення (змінного струму). Розетка електромережі, до якої підключається система, мусить бути розташована поруч із обладнанням і легко доступна.

КРОКИ БЕЗПЕКИ: Щоразу, знимаючи корпус для доступу до внутрішніх частин системи, виконуйте ці кроки:
7. Вимкніть усі периферійні пристрої, підключені до системи.
8. Вимкніть систему, натиснувши кнопку живлення.
9. Вийміть шнури живлення змінного струму із системи чи стінних розеток.
10. Позначте і від'єднайте всі кабелі, підключені до з'єднувачів входу/виходу або портів ззаду на системі.
11. Працюючи з компонентами, захищається від електростатичних розрядів (ЕР), вдягайте антистатичний ремінець-браслет, прикріплений до елемента заземлення корпусу - будь-якої непофарбованої металевої поверхні.
12. Не використовуйте систему з відкритим корпусом.

Після виконання шести наведених вище кроків БЕЗПЕКИ можна знімати корпус (кришки) з системи. Для цього виконайте такі дії:
4. Розблокуйте і зніміть замок ззаду на системі, якщо його встановлено.
5. Зніміть і зберігайте всі гвинти з кришок.
6. Зніміть усі кришки.

продовження
УВАГА! Українська (продовження)

Для правильного охолодження та вентиляції завжди повертайте на місце кришки корпусу перед увімкненням системи. Робота системи без кришок може пошкодити деталі системи. Щоб установити кришки, виконайте такі дії:

6. Спочатку переконайтеся, що всередині системи не залишилося деталей або незакріплених інструментів.
7. Перевірте, чи правильно встановлено кабелі, розширювальні плати та інші компоненти.
8. Прикріпіть кришки до корпусу знятими раніше гвинтами та надійно їх затягніть.
9. Вставте в систему і зафіксуйте замок, щоб запобігти неавторизованому доступу до нього.
10. Підключіть усі зовнішні кабелі та шнур(и) живлення змінного струму до системи.

Під час роботи системи мікропроцесор і радіатор можуть розігрітися до гарячого. Деякі частини корпусу і плат можуть мати гострі шипи або краї. Із ними слід поводитися обережно. Можна вдягти захисні рукавички.

Загроза вибуху, якщо батарею замінено на неправильну. Замініть лише таким самим або еквівалентним типом, рекомендованим виробником. Утилізуйте використані батареї згідно з інструкціями виробника.

Систему створено для роботи в типовому офісному приміщенні. Виберіть місце, яке:
• Чисте і де немає в повітрі інших дрібних часточок, окрім звичайного побутового пилу.
• Добре провітряється, розташоване далеко від джерел тепла, включно з прямим сонячним промінням.
• Розташоване далеко від джерел вібрації і струсів.
• Ізольоване від сильних електромагнітних полів, спричинених електроприладами.
• У регіонах, де часто проходять грози, радимо підключати пристрій через пристрій захисту від викидів напруги та відключаючи телекомунікаційні лінії від модему під час грози.
• Оснащене правильно заземленими стінними розетками електромережі.
• Має достатньо простору для доступу до шнур(ів) живлення, оскільки вони слугують основними вимикачами виробу.
AVERTISSEMENT: Français

Le bloc d'alimentation de ce produit ne contient aucune pièce pouvant être réparée par l'utilisateur. Ce produit peut contenir plus d'un bloc d'alimentation. Veuillez contacter un technicien qualifié en cas de problème.

Ne pas essayer d'utiliser ni modifier le câble d'alimentation CA fourni, s'il ne correspond pas exactement au type requis. Le nombre de câbles d'alimentation CA fournis correspond au nombre de blocs d'alimentation du produit.

Notez que le commutateur CC de mise sous tension /hors tension du panneau avant n'éteint pas l'alimentation CA du système. Pour mettre le système hors tension, vous devez débrancher chaque câble d'alimentation de sa prise.

CONSIGNES DE SÉCURITÉ: Lorsque vous ouvrez le boîtier pour accéder à l'intérieur du système, suivez les consignes suivantes:

1. Mettez hors tension tous les périphériques connectés au système.
2. Mettez le système hors tension en mettant l'interrupteur général en position OFF (bouton-poussoir).
3. Débranchez tous les cordons d'alimentation c.a. du système et des prises murales.
4. Identifiez et débranchez tous les câbles reliés aux connecteurs d'E-S ou aux accès derrière le système.
5. Pour prévenir les décharges électrostatiques lorsque vous touchez aux composants, portez une bande antistatique pour poignet et reliez-la à la masse du système (toute surface métallique non peinte du boîtier).
6. Ne faites pas fonctionner le système tandis que le boîtier est ouvert.

Une fois TOUTES les étapes précédentes accomplies, vous pouvez retirer les panneaux du système. Procédez comme suit:

1. Si un cadenas a été installé sur à l'arrière du système, déverrouillez-le et retirez-le.
2. Retirez toutes les vis des panneaux et mettez-les dans un endroit sûr.
3. Retirez les panneaux.
Afin de permettre le refroidissement et l’aération du système, réinstallez toujours les panneaux du boîtier avant de mettre le système sous tension. Le fonctionnement du système en l’absence des panneaux risque d’endommager ses pièces. Pour installer les panneaux, procédez comme suit:

1. Assurez-vous de ne pas avoir oublié d'outils ou de pièces démontées dans le système.
2. Assurez-vous que les câbles, les cartes d'extension et les autres composants sont bien installés.
3. Revissez solidement les panneaux du boîtier avec les vis retirées plus tôt.
4. Remettez le cadenas en place et verrouillez-le afin de prévenir tout accès non autorisé à l’intérieur du système.
5. Rebranchez tous les cordons d'alimentation c. a. et câbles externes au système.

Le microprocesseur et le dissipateur de chaleur peuvent être chauds si le système a été sous tension. Faites également attention aux broches aiguës des cartes et aux bords tranchants du capot. Nous vous recommandons l'usage de gants de protection.

Danger d'explosion si la batterie n'est pas remontée correctement. Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le fabricant. Disposez des piles usées selon les instructions du fabricant.

Le système a été conçu pour fonctionner dans un cadre de travail normal. L'emplacement choisi doit être:

- Propre et dépourvu de poussière en suspension (sauf la poussière normale).
- Bien aéré et loin des sources de chaleur, y compris du soleil direct.
- A l’abri des chocs et des sources de vibrations.
- Isolé de forts champs électromagnétiques générés par des appareils électriques.
- Dans les régions sujettes aux orages magnétiques il est recommandé de brancher votre système à un suppresseur de surtension, et de débrancher toutes les lignes de télécommunications de votre modem durant un orage.
- Muni d'une prise murale correctement mise à la terre.
- Suffisamment spacieux pour vous permettre d'accéder aux câbles d'alimentation (ceux-ci étant le seul moyen de mettre le système hors tension).
WARNUNG: Deutsch


Versuchen Sie nicht, das mitgelieferte Netzkabel zu ändern oder zu verwenden, wenn es sich nicht genau um den erforderlichen Typ handelt. Ein Produkt mit mehreren Netzgeräten hat für jedes Netzgerät ein eigenes Netzkabel.


SICHERHEITSMASSNAHMEN: Immer wenn Sie die Gehäuseabdeckung abnehmen um an das Systeminnere zu gelangen, sollten Sie folgende Schritte beachten:

1. Schalten Sie alle an Ihr System angeschlossenen Peripheriegeräte aus.
2. Schalten Sie das System mit dem Hauptschalter aus.
5. Tragen Sie ein geerdetes Antistatik Gelenkband, um elektrostatische Ladungen (ESD) über blanke Metallstellen bei der Handhabung der Komponenten zu vermeiden.

Nachdem Sie die oben erwähnten ersten sechs SICHERHEITSSCHRITTE durchgeführt haben, können Sie die Abdeckung abnehmen, indem Sie:

1. Öffnen und entfernen Sie die Verschlußeinrichtung (Padlock) auf der Rückseite des Systems, falls eine Verschlußeinrichtung installiert ist.
2. Entfernen Sie alle Schrauben der Gehäuseabdeckung.
3. Nehmen Sie die Abdeckung ab.
Zur ordnungsgemäßen Kühlung und Lüftung muß die Gehäuseabdeckung immer wieder vor dem Einschalten installiert werden. Ein Betrieb des Systems ohne angebrachte Abdeckung kann Ihrem System oder Teile darin beschädigen. Um die Abdeckung wieder anzubringen:

1. Vergewissern Sie sich, daß Sie keine Werkzeuge oder Teile im Innern des Systems zurückgelassen haben.
2. Überprüfen Sie alle Kabel, Zusatzkarten und andere Komponenten auf ordnungsgemäßen Sitz und Installation.
3. Bringen Sie die Abdeckungen wieder am Gehäuse an, indem Sie die zuvor gelösten Schrauben wieder anbringen. Ziehen Sie diese gut an.
4. Bringen Sie die Verschlußeinrichtung (Padlock) wieder an und schließen Sie diese, um ein unerlaubtes Öffnen des Systems zu verhindern.


Das System wurde für den Betrieb in einer normalen Büromgebung entwickelt. Der Standort sollte:

- sauber und staubfrei sein (Hausstaub ausgenommen);
- gut gelüftet und keinen Heizquellen ausgesetzt sein (einschließlich direkter Sonneneinstrahlung);
- keinen Erschütterungen ausgesetzt sein;
- keine starken, von elektrischen Geräten erzeugten elektromagnetischen Felder aufweisen;
- in Regionen, in denen elektrische Stürme auftreten, mit einem Überspannungsschutzgerät verbunden sein; während eines elektrischen Sturms sollte keine Verbindung der Telekommunikationsleitungen mit dem Modem bestehen;
- mit einer geerdeten Wechselstromsteckdose ausgerüstet sein;
- über ausreichend Platz verfügen, um Zugang zu den Netzkabeln zu gewährleisten, da der Stromanschluß des Produkts hauptsächlich über die Kabel unterbrochen wird.
AVVERTENZA: Italiano

Rivolgersi ad un tecnico specializzato per la riparazione dei componenti dell'alimentazione di questo prodotto. È possibile che il prodotto disponga di più fonti di alimentazione.

Non modificare o utilizzare il cavo di alimentazione in c.a. fornito dal produttore, se non corrisponde esattamente al tipo richiesto. Ad ogni fonte di alimentazione corrisponde un cavo di alimentazione in c.a. separato.

L'interruttore attivato/disattivato nel pannello anteriore non interrompe l'alimentazione in c.a. del sistema. Per interromperla, è necessario scollegare tutti i cavi di alimentazione in c.a. dalle prese a muro o dall'alimentazione di corrente.

PASSI DI SICUREZZA: Qualora si rimuovano le coperture del telaio per accedere all'interno del sistema, seguire i seguenti passi:

1. Spegnere tutti i dispositivi periferici collegati al sistema.
2. Spegnere il sistema, usando il pulsante spento/acceso dell'interruttore del sistema.
3. Togliere tutte le spine dei cavi del sistema dalle prese elettriche.
4. Identificare e sconnettere tutti i cavi attaccati ai collegamenti I/O od alle prese installate sul retro del sistema.
5. Qualora si tocchino i componenti, proteggersi dallo scarico elettrostatico (SES), portando un cinghia anti-statica da polso che è attaccata alla presa a terra del telaio del sistema – qualsiasi superficie non dipinta – .
6. Non far operare il sistema quando il telaio è senza le coperture.

Dopo aver seguito i sei passi di SICUREZZA sopracitati, togliere le coperture del telaio del sistema come seque:

1. Aprire e rimuovere il lucchetto dal retro del sistema qualora ve ne fosse uno installato.
2. Togliere e mettere in un posto sicuro tutte le viti delle coperture.
3. Togliere le coperture.
Per il giusto flusso dell'aria e raffreddamento del sistema, rimettere sempre le coperture del telaio prima di riaccendere il sistema. Operare il sistema senza le coperture al loro proprio posto potrebbe danneggiare i componenti del sistema. Per rimettere le coperture del telaio:

1. Controllare prima che non si siano lasciati degli attrezzi o dei componenti dentro il sistema.
2. Controllare che i cavi, dei supporti aggiuntivi ed altri componenti siano stati installati appropriatamente.
3. Attaccare le coperture al telaio con le viti tolte in precedenza e avvitarle strettamente.
4. Inserire e chiudere a chiave il lucchetto sul retro del sistema per impedire l'accesso non autorizzato al sistema.
5. Ricollegare tutti i cavi esterni e le prolunghe AC del sistema.

Se il sistema è stato a lungo in funzione, il microprocessore e il dissipatore di calore potrebbero essere surriscaldati. Fare attenzione alla presenza di piedini appuntiti e parti taglienti sulle schede e sul telaio. È consigliabile l'uso di guanti di protezione.

Esiste il pericolo di un esplosione se la pila non viene sostituita in modo corretto. Utilizzare solo pile uguali o di tipo equivalente a quelle consigliate dal produttore. Per disfarsi delle pile usate, seguire le istruzioni del produttore.

Il sistema è progettato per funzionare in un ambiente di lavoro tipo. Scegliere una postazione che sia:

- Pulita e libera da particelle in sospensione (a parte la normale polvere presente nell'ambiente).
- Ben ventilata e lontana da fonti di calore, compresa la luce solare diretta.
- Al riparo da urti e lontana da fonti di vibrazione.
- Isolata dai forti campi magnetici prodotti da dispositivi elettrici.
- In aree soggette a temporali, è consigliabile collegare il sistema ad un limitatore di corrente. In caso di temporali, scollegare le linee di comunicazione dal modem.
- Dotata di una presa a muro correttamente installata.
- Dotata di spazio sufficiente ad accedere ai cavi di alimentazione, i quali rappresentano il mezzo principale di scollegamento del sistema.
ADVERTENCIAS: Español

El usuario debe abstenerse de manipular los componentes de la fuente de alimentación de este producto, cuya reparación debe dejarse exclusivamente en manos de personal técnico especializado. Puede que este producto disponga de más de una fuente de alimentación.

No intente modificar ni usar el cable de alimentación de corriente alterna, si no corresponde exactamente con el tipo requerido.

El número de cables suministrados se corresponden con el número de fuentes de alimentación de corriente alterna que tenga el producto.

Nótese que el interruptor activado/desactivado en el panel frontal no desconecta la corriente alterna del sistema. Para desconectarla, deberá desenchufar todos los cables de corriente alterna de la pared o desconectar la fuente de alimentación.

INSTRUCCIONES DE SEGURIDAD: Cuando extraiga la tapa del chasis para acceder al interior del sistema, siga las siguientes instrucciones:

1. Apague todos los dispositivos periféricos conectados al sistema.
2. Apague el sistema presionando el interruptor encendido/apagado.
3. Desconecte todos los cables de alimentación CA del sistema o de las tomas de corriente alterna.
4. Identifíque y desconecte todos los cables enchufados a los conectores E/S o a los puertos situados en la parte posterior del sistema.
5. Cuando manipule los componentes, es importante protegerse contra la descarga electrostática (ESD). Puede hacerlo si utiliza una muñequera antiestática sujetada a la toma de tierra del chasis — o a cualquier tipo de superficie de metal sin pintar.
6. No ponga en marcha el sistema si se han extraído las tapas del chasis.

Después de completar las seis instrucciones de SEGURIDAD mencionadas, ya puede extraer las tapas del sistema. Para ello:

1. Desbloquee y extraiga el bloqueo de seguridad de la parte posterior del sistema, si se ha instalado uno.
2. Extraiga y guarde todos los tornillos de las tapas.
3. Extraiga las tapas.
Para obtener un enfriamiento y un flujo de aire adecuados, reinstale siempre las tapas del chasis antes de poner en marcha el sistema. Si pone en funcionamiento el sistema sin las tapas bien colocadas puede dañar los componentes del sistema. Para instalar las tapas:

1. Asegúrese primero de no haber dejado herramientas o componentes sueltos dentro del sistema.
2. Compruebe que los cables, las placas adicionales y otros componentes se hayan instalado correctamente.
3. Incorpore las tapas al chasis mediante los tornillos extraídos anteriormente, tensándolos firmemente.
4. Inserte el bloqueo de seguridad en el sistema y bloquéelo para impedir que pueda accederse al mismo sin autorización.
5. Conecte todos los cables externos y los cables de alimentación CA al sistema.

Si el sistema ha estado en funcionamiento, el microprocesador y el disipador de calor pueden estar aún calientes. También conviene tener en cuenta que en el chasis o en el tablero puede haber piezas cortantes o punzantes. Por ello, se recomienda precaución y el uso de guantes protectores.

Existe peligro de explosión si la pila no se cambia de forma adecuada. Utilice solamente pilas iguales o del mismo tipo que las recomendadas por el fabricante del equipo. Para deshacerse de las pilas usadas, siga igualmente las instrucciones del fabricante.

El sistema está diseñado para funcionar en un entorno de trabajo normal. Escoja un lugar:

- Limpio y libre de partículas en suspensión (salvo el polvo normal).
- Bien ventilado y alejado de fuentes de calor, incluida la luz solar directa.
- Alejado de fuentes de vibración.
- Aislado de campos electromagnéticos fuertes producidos por dispositivos eléctricos.
- En regiones con frecuentes tormentas eléctricas, se recomienda conectar su sistema a un eliminador de sobrevoltaje y desconectar el módem de las líneas de telecomunicación durante las tormentas.
- Provisto de una toma de tierra correctamente instalada.
- Provisto de espacio suficiente como para acceder a los cables de alimentación, ya que éstos hacen de medio principal de desconexión del sistema.
eliminar el voltaje. Para hacerlo, desconecte todos los cables de alimentación del sistema o de las tomas de pared.

1. Pulse el botón de encendido en el sistema para apagarlo.
2. Desconecte todos los cables de alimentación del sistema o de las tomas de pared.
3. Saque el sistema de su caja y guárdelo.
4. Para garantizar la protección contra corrientes estáticas, utilice una muñequera antistática que esté conectada a tierra.
5. No vuelva a encender el sistema hasta que todas las piezas internas estén montadas correctamente.

Important: This system contains components that are not intended or designed for service by the user. There may be more than one power source in this product. For service, contact only authorized personnel.

Do not attempt to change the supplied power cord or replace it unless it is the correct type as specified. For products with more than one power cord, a separate power cord is provided for each power source.

There is no power cord. The power cord is an integral part of the system. To remove power from the system, remove all power cords from the system or wall outlets.

The back panel of the system will be used to ease access to the internal components. To access the internal components, please follow the following steps:

1. Remove all power cords and any external devices.
2. Remove all power switches from the system.
3. Remove all power cords from the system or wall outlets.
4. Ensure that you have a grounded pad of ESD (Electrostatic Discharge) protection by touching the ground pad of the system on any metal surface not painted.
5. Ensure that you are using the same ground pad as the system when handling any components.
6. Do not run the system if the cover is removed.
מכסי המעטפת לפני הפעלת המערכת. הפעלת המערכת ללא לקירור ולזרימת אוויר תקינים, יש תמיד להתקין מחדש את המכסים במקומם, עלולותявление בחלקי המארז. להתקין המכסים: 1. יש לבדוק תחילה כדי לוודא שלא נשארו כלים או חלקי רוספים בחלקי המארז. 2. ישلاح את שכבת החומרים החמוצים וחומרים אחרים במארז. 3. ישלח את המכסים למקטיף עבור חומרים חמים או חומרים אחרים במארז. 4. ישלח את המכסים למקטיף נוספים בחלקי המארז. 5. ישלח את כל החפצים והアクセסוריים ואת הכלים הארגון嘿嘿ן ל"ג"lates חזרה.

מצבים מקריר למסור חום עלולות להちょうך על צורת המארז. חומרים חמים בחלקי המארז חשובים על פנים המארז.

סכמת פיזור: איסוף חומרים מת CACHE או חומרים אחרים במערכת. ישלח את רק ב המערכת או שווה הספרים על ידי יצור."ז"זר. ישלח את וולתם של ממקחי מתוך של כמות פיזור עליון.

המרכזן מתכם בקלטת במשוך שירותים ישלח את גרוד. ישלח את המרכז海鲜ך בפער ממקחי נועדوصف במערכת: 1. נקח ממקחי נועדوصف במערכת (להלן שוק במקחי נועדוегистר, ריד במקחי). 2. נקח ממקחי נועדוегистר במערכת. 3. נקח ממקחי נועדוегистר במערכת נועדוampilיה. 4. נקח ממקחי נועדוampilיה במערכת. 5. נקח ממקחי נועדוampilיה במערכת. 6. נקח ממקחי נועדוampilיה במערכת.
# Appendix H. Glossary

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tbody>
<tr>
<td>ACPI</td>
<td>Advanced Configuration and Power Interface</td>
</tr>
<tr>
<td>ASHRAE</td>
<td>American Society of Heating, Refrigerating and Air-Conditioning Engineers</td>
</tr>
<tr>
<td>BBS</td>
<td>BIOS Boot Specification</td>
</tr>
<tr>
<td>BMC</td>
<td>Baseboard Management Controller</td>
</tr>
<tr>
<td>BIOS</td>
<td>Basic Input/Output System</td>
</tr>
<tr>
<td>CMOS</td>
<td>Complementary Metal-oxide-semiconductor</td>
</tr>
<tr>
<td>CPU</td>
<td>Central Processing Unit</td>
</tr>
<tr>
<td>DDR5</td>
<td>Double Data Rate 5th edition</td>
</tr>
<tr>
<td>DIMM</td>
<td>Dual In-line Memory Module</td>
</tr>
<tr>
<td>DPC</td>
<td>DIMMs per Channel</td>
</tr>
<tr>
<td>FP</td>
<td>Front Panel</td>
</tr>
<tr>
<td>FRB</td>
<td>Fault Resilient Boot</td>
</tr>
<tr>
<td>FRU</td>
<td>Field Replaceable Unit</td>
</tr>
<tr>
<td>GPIO</td>
<td>General Purpose Input/Output</td>
</tr>
<tr>
<td>GUI</td>
<td>Graphical User Interface</td>
</tr>
<tr>
<td>I²C</td>
<td>Inter-integrated Circuit bus</td>
</tr>
<tr>
<td>IMC</td>
<td>Integrated Memory Controller</td>
</tr>
<tr>
<td>iPC</td>
<td>Intel Product Code</td>
</tr>
<tr>
<td>IPMI</td>
<td>Intelligent Platform Management Interface</td>
</tr>
<tr>
<td>ISTA</td>
<td>International Safe Transit Association</td>
</tr>
<tr>
<td>LED</td>
<td>Light Emitting Diode</td>
</tr>
<tr>
<td>LFM</td>
<td>Linear Feet per Minute – Airflow measurement</td>
</tr>
<tr>
<td>LPC</td>
<td>Low-pin Count</td>
</tr>
<tr>
<td>LRDIMM</td>
<td>Load Reduced DIMM</td>
</tr>
<tr>
<td>LSB</td>
<td>Least Significant Bit</td>
</tr>
<tr>
<td>MSB</td>
<td>Most Significant Bit</td>
</tr>
<tr>
<td>MRC</td>
<td>Memory Reference Code</td>
</tr>
<tr>
<td>MTBF</td>
<td>Mean Time Between Failure</td>
</tr>
<tr>
<td>NAT</td>
<td>Network Address Translation</td>
</tr>
<tr>
<td>NIC</td>
<td>Network Interface Controller</td>
</tr>
<tr>
<td>NMI</td>
<td>Non-maskable Interrupt</td>
</tr>
<tr>
<td>NTB</td>
<td>Non-Transparent Bridge</td>
</tr>
<tr>
<td>OCuLink</td>
<td>Optical Copper Link</td>
</tr>
<tr>
<td>OEM</td>
<td>Original Equipment Manufacturer</td>
</tr>
<tr>
<td>OCP*</td>
<td>Open Compute Project</td>
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<tr>
<td>OR</td>
<td>Oct Rank</td>
</tr>
<tr>
<td>PCH</td>
<td>Peripheral Controller Hub</td>
</tr>
<tr>
<td>PCI</td>
<td>Peripheral Component Interconnect</td>
</tr>
<tr>
<td>PCB</td>
<td>Printed Circuit Board</td>
</tr>
<tr>
<td>PCIe*</td>
<td>Peripheral Component Interconnect Express*</td>
</tr>
<tr>
<td>PFC</td>
<td>Power Factor Correction</td>
</tr>
<tr>
<td>PHM</td>
<td>Processor Heat sink Module</td>
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<tr>
<td>PMBus</td>
<td>Power Management Bus</td>
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<tr>
<td>Term</td>
<td>Definition</td>
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<td>-------------------------------------------------------------------</td>
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<tr>
<td>POST</td>
<td>Power-on Self-Test</td>
</tr>
<tr>
<td>PSU</td>
<td>Power Supply Unit</td>
</tr>
<tr>
<td>PWM</td>
<td>Pulse Width Modulation</td>
</tr>
<tr>
<td>QR</td>
<td>Quad Rank</td>
</tr>
<tr>
<td>RAID</td>
<td>Redundant Array of Independent Disks</td>
</tr>
<tr>
<td>RAM</td>
<td>Random Access Memory</td>
</tr>
<tr>
<td>RAS</td>
<td>Reliability, Availability, and Serviceability</td>
</tr>
<tr>
<td>RCIEP</td>
<td>Root Complex Integrated Endpoint</td>
</tr>
<tr>
<td>RDIMM</td>
<td>Registered DIMM</td>
</tr>
<tr>
<td>RMCP</td>
<td>Remote Management Control Protocol</td>
</tr>
<tr>
<td>ROC</td>
<td>RAID On Chip</td>
</tr>
<tr>
<td>SAS</td>
<td>Serial Attached SCSI</td>
</tr>
<tr>
<td>SATA</td>
<td>Serial Advanced Technology Attachment</td>
</tr>
<tr>
<td>SEL</td>
<td>System Event Log</td>
</tr>
<tr>
<td>SCA</td>
<td>Single Connector Attachment</td>
</tr>
<tr>
<td>SCSI</td>
<td>Small Computer System Interface</td>
</tr>
<tr>
<td>SDR</td>
<td>Sensor Data Record</td>
</tr>
<tr>
<td>SFF</td>
<td>Small Form Factor</td>
</tr>
<tr>
<td>SFP</td>
<td>Small Form-factor Pluggable</td>
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<tr>
<td>SMBus</td>
<td>System Management Bus</td>
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<tr>
<td>SR</td>
<td>Single Rank</td>
</tr>
<tr>
<td>SSD</td>
<td>Solid State Device</td>
</tr>
<tr>
<td>TCG</td>
<td>Trusted Computing Group</td>
</tr>
<tr>
<td>TDP</td>
<td>Thermal Design Power</td>
</tr>
<tr>
<td>Intel® UPI</td>
<td>Intel® Ultra Path Interconnect</td>
</tr>
<tr>
<td>Intel® VROC</td>
<td>Intel® Virtual RAID on CPU</td>
</tr>
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</table>