

# » Installation and Maintenance Guide «



## Kontron CG2300 Carrier Grade Server

Document Revision 1.5

## Revision History

Revision	Brief description of changes	Date of issue
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1.1	Updates for cover pin warning and UL Safety information DC Power Cable building instructions added	09/04/2015
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## Acronyms

ASIC	Application specific integrated circuit
BIOS	Basic input/output system
BMC	Bus management controller
CE	Community European (EU mark)
CRMS	Communications Rack Mount Servers
CSA	Canadian Standards Organization
DC	Direct current
DDR4	Double Data Rate Fourth Generation
DIMM	Dual inline memory module
DRAM	Dynamic random access memory
ECC	Error checking and correcting
EEPROM	Electrically erasable programmable read-only memory
EMC	Electromagnetic compatibility
EMI	Electromagnetic interference
ESD	Electrostatic discharge
ETSI	European Telecommunications Standards Institute
eUSB	Embedded Universal Serial Bus
FCC	Federal Communications Commission
FH/FL	Full Height/Full Length
FRU	Field replaceable unit
Gb, Gbit	Gigabit
GB, Gbyte	Gigabyte - 1024 MB
GbE	Gigabit Ethernet
GOST	Gosudarstvennyy Standart
GND	Ground
GPIO	General purpose input/output
GUI	Graphical user interface
HDD	Hard disk drive
Hz	Hertz - 1 cycle/second
I/O	Input/output
I <sup>2</sup> C	Inter-integrated circuit bus
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
IPMB	Intelligent Platform Management Bus
IPMI	Intelligent Platform Management Initiative
IRQ	Interrupt request line
KB, Kbyte	Kilobyte - 1024 bytes
LAN	Local Area Network
LED	Light-Emitting Diode
LP	Low Profile

LVDS	Low Voltage Differential SCSI
MB, Mbyte	Megabyte – 1024 KB
NEBS	Network Equipment-Building System
NEMKO	Norges Elektriske Materiellkontroll (Norwegian Board of Testing and Approval of Electrical Equipment)
NIC	Network interface card, or Network Interface Controller, or Network Interface Controller port
NMI	Non-maskable interrupt
OTP	Over-temperature protection
OVP	Over-voltage protection
PCI	Peripheral component interconnect
PCIe	Peripheral Component Interconnect Express
PIRQ	PCI interrupt request line
PMM	POST memory manager
PnP	Plug and play
POST	Power-On Self Test
PSU	Power Supply Unit
RAID	Redundant Array of Independent Disks
RAS	Reliability, Availability, and Serviceability
RDIMM	Registered Dual In-Line Memory Module
RMM	Remote Management Module
RoHS	Restriction of Hazardous Substances
SAS	Serial Attached SCSI (Small Computer System Interface)
SATA	Serial Advanced Technology Attachment
SCSI	Small Computer Systems Interface
SDRAM	Synchronous Dynamic RAM
SEL	System Event Log
SEMKO	Sverige Elektriske Materiellkontroll (Swedish Board of Testing and Approval of Electrical Equipment)
SMBus	Subset of I <sup>2</sup> C bus/protocol (developed by Intel), System Management Bus
SMRAM	System Management RAM
SMS	Server Management Software
SSD	Solid State Drive
THOL	Tested Hardware and Operating System List
TUV	Technischer Überwachungs-Verein (A safety testing laboratory with headquarters in Germany)
UL	Underwriters Laboratories, Inc.
USB	Universal Serial Bus
UV	Under-Voltage
V	Volt
VA	Volt-amps (volts multiplied by amps)
Vac	Volts alternating current



Vdc	Volts direct current
VDE	Verband Deutscher Electrotechniker (German Institute of Electrical Engineers)
VGA	Video Graphics Array
VSB	Voltage standby
W	Watt
$\Omega$	Ohm

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## Electrostatic Discharge

**CAUTION:** The CG2300 server is sensitive to electrostatic discharge (ESD). Users must observe the appropriate precautions when handling ESD-sensitive devices.

### Limited Warranty

Kontron grants the original purchaser of Kontron products a **THREE YEAR LIMITED HARDWARE WARRANTY** as described in the following section below. However, no other warranties that may be granted or implied by anyone on behalf of Kontron are valid unless the consumer has the express written consent of Kontron.

Kontron warrants their own products, excluding software, to be free from manufacturing and material defects for a period of 36 consecutive months from the date of purchase. This warranty is neither transferable nor extendible to cover any other users or long-term storage of the product. It does not cover products that have been modified, altered, or repaired by any other party than Kontron or their authorized agents. Furthermore, any product that has been, or is suspected of being, damaged as a result of negligence, improper use, incorrect handling, servicing, or maintenance, or which has been damaged as a result of excessive current/voltage or temperature, or which has had its serial number(s), any other markings or parts thereof altered, defaced or removed will also be excluded from this warranty.

If the customer's eligibility for warranty has not been voided, in the event of any claim, he may return the product at the earliest possible convenience to the original place of purchase, together with a copy of the original document of purchase, a full description of the application the product is used on, and a description of the defect. Pack the product in such a way as to ensure safe transportation (see our safety instructions).

Kontron provides for repair or replacement of any part, assembly or sub-assembly at its own discretion, or to refund the original cost of purchase, if appropriate. In the event of repair, refunding or replacement of any part, the ownership of the removed or replaced parts reverts to Kontron, and the remaining part of the original guarantee, or any new guarantee to cover the repaired or replaced items, will be transferred to cover the new or repaired items. Any extensions to the original guarantee are considered gestures of goodwill, and will be defined in the "Repair Report" issued by Kontron with the repaired or replaced item.

Kontron will not accept liability for any further claims resulting directly or indirectly from any warranty claim, other than the above specified repair, replacement or refunding. In particular, all claims for damage to any system or process in which the product was employed, or any loss incurred as a result of the product not functioning at any given time, are excluded. The extent of Kontron liability to the customer shall not exceed the original purchase price of the item for which the claim exists.

Kontron issues no warranty or representation, either explicit or implicit, with respect to its products reliability, fitness, quality, marketability or ability to fulfill any particular application or purpose. As a result, the products are sold "as is," and the responsibility to ensure their suitability for any given task remains that of the purchaser. In no event will Kontron be liable for direct, indirect, or consequential damages resulting from the use of our hardware or software products or documentation, even if Kontron were advised of the possibility of such claims prior to the purchase of the product or during any period since the date of its purchase.

Please remember that no Kontron employee, dealer or agent is authorized to make any modification or addition to the above specified terms, either verbally or in any other form, written or electronically transmitted, without the company's consent.

# 1 Information

## 1.1 Product Description

The CG2300 Carrier Grade Server is the 7th generation of the Kontron 2U Carrier Grade Server products. The CG2300 server supports Intel® Xeon® E5-2600 v3 and v4 series processors, coupling high performance with power efficiency to provide improved performance-per-watt over previous generation rack-mount servers.

The CG2300 server is designed to meet NEBS-3 and ETSI certification, which makes it suited for a host of applications in the telecom Central Office and industrial environment. The server is targeted to OSS (Operations System and Support), Billing, Provisioning, Softswitch, Media Server, Wireless and Unified Messaging, Call Center, and many other applications. The CG2300 server can also support manufacturing, industrial, oil & gas, utility, and even military applications where a rugged, highly reliable server is required for harsh environments such as dust, high altitude, fire hazard, earthquake propensity, and high ambient temperatures.

To add to the many recognized benefits of the Kontron Carrier Grade Server family, the CG2300 server introduces several new important features such as support of Intel® Xeon® v3 and v4 (E5-26XX v3, E5-26XX v4) processors, DDR4 memory, PCIe Gen3, hot-swap/redundant fans and many flash storage formats (SD, eUSB, M.2).

More detailed product information about the CG2300 server is available on the Kontron website at:

<http://www.kontron.com/products/systems/telecom-systems/cg2300-carrier-grade-rackmount-server.html>

## 1.2 Purpose of this Document

This manual is for trained system technicians who are responsible for assembling/integrating systems, configuring hardware, troubleshooting, upgrading and maintaining this server. This document provides a brief overview of the features of the system followed by a list of accessories or other components available for purchase, instructions for how to add or replace components in the CG2300 server, and troubleshooting information.

**NOTE:** Always be sure to search for CG2300 on the Support website at <http://www.kontron.com/> for the latest version of this manual with possible updates since this version was published.

## 2 System Overview

### 2.1 What the Server Includes

The CG2300 server includes the following components:

- » One 2U chassis
- » One Intel® Server Board S2600CW2SK with DDR4 memory slots (memory not included)
- » Six removable hard drive carriers
- » DC or AC power subsystem: one or two hot-swappable power supply modules and a power distribution board. The number of power supplies depends on the selected configuration. When only one power supply is used, the other power supply bay has a filler panel in it.)
- » Six fan assemblies for cooling the processor(s), DIMM(s), PCI slot(s), and other internal components in three cooling zones.
- » A front panel board, an LED/switch board, and a telco alarms module (TAM) board
- » Internal boards, cables and connectors

### 2.2 Product Accessories

The following list shows the separately orderable components and optional accessories available for inclusion in the initial order or to have as spares. Refer to the *CG2300 Carrier Grade Server Configuration Guide* for a complete list of orderable spares and options. The Configuration Guide can be found on the Kontron Support Website at <http://kontron.com/> (Rack Mount Systems - CRMS - CG2300 - Ordering Guide).

- » LGA 2011-3 (socket R3) support for Intel® Xeon® E5-2600 v3 series processors
- » Registered DDR4 Memory (RDIMM), and Load Reduced DDR4 Memory (LR-DIMM)
- » Up to six hot-swappable 2.5" SAS HDDs or SATA SSDs
- » Hard disk drive carriers (six already shipped with the server)
- » Optional hardware RAID controller (low profile PCIe card)
- » Two front access SD media flash modules
- » Internal flash storage supported (eUSB and M.2)
- » Two risers (four FH/FL cards) and two LP adapters for a total of six PCIe Gen3 I/O cards
- » Power cord(s)
- » AC or DC power supply module (850W) with redundancy option
- » Intel® Remote Management Module 4 (RMM4Lite) option
- » Rack mount kits

For information about the accessories, memory, processors, and ordering information, refer to the *CG2300 Carrier Grade Server Configuration Guide* at <http://kontron.com/> (CRMS - CG2300 - Ordering Guide).

For information about third-party hardware that has been tested and can be used with the system, refer to the *CG2300 Carrier Grade Server Tested Hardware and Operating System List (THOL)* at <http://kontron.com/> (Rack Mount Systems - CRMS - CG2300 - Tested Hardware and Operating System List (THOL)).

## 2.3 Additional Information and Software

If you need more technical information or information about the accessories that can be used with this CG2300 server, refer to the Technical Product Specification (TPS) for the system and/or for the server board. The TPS documents are located on the Kontron support website at <http://kontron.com/> (Rack Mount Systems - CRMS - CG2300). The system TPS provides in-depth technical information about the server. The server board TPS provides in-depth technical information about the server board, including BIOS settings and chipset information.

## 3 Normal Maintenance Tasks

This chapter covers the tasks you will most likely and most often need to do on the CG2300 server. These tasks involve hot-swappable components only, so there is no need to power down the server or remove the system cover.

### 3.1 Adding or Replacing Hot-Swappable Hard Disk Drives

Up to six hot-swappable SAS hard disk drives can be installed in the CG2300 server. The drives go into carriers that connect to the SAS backplane board once the carriers with drives attached are inserted back into the drive bay slots. The CG2300 server ships with six drive carriers.

While you must remove the front bezel to add or replace a hard drive in one of the drive slots, it is not necessary to remove the chassis cover or to power down the system. The hard drives are hot-swappable.

**CAUTION:** If fewer than six hard disk drives are being installed, to maintain proper cooling the unused drive slots must contain the empty carriers with filler panels that ship with the server.

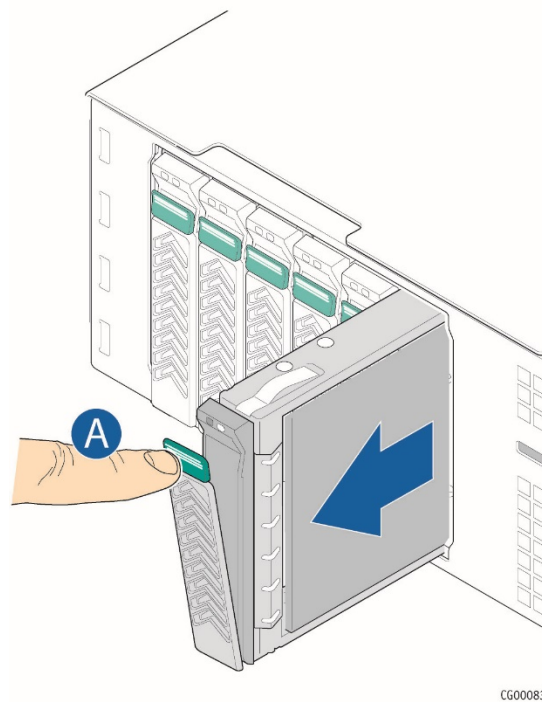
The CG2300 server does not support all SAS HDD or SATA SSD disk drives. To see a list of validated manufacturers and drive models, refer to the THOL. The latest version of the THOL is located on the Kontron support website at <http://kontron.com>. (Rack Mount Systems - CRMS - CG2300 - Tested Hardware and Operating System List (THOL)).

**NOTE:** SATA rotating HDDs are not recommended for use in this system because they are sensitive to rotational vibration from system fan blades.

#### 3.1.1 Removing an HDD Carrier from the Chassis

1. Remove the front bezel. For instructions, see (I) in Chapter 4.
2. Select the drive slot where the drive will be installed or replaced.  
Drive slot 0 must be used first, then drive slot 1, and so on.  
(Drive slot numbers are printed on the front panel below the drive slots.)
3. Remove the drive carrier by pressing the green button to open the lever that engages the drive to the backplane. (Figure 1, "A").
4. Pull the drive carrier out of the chassis.

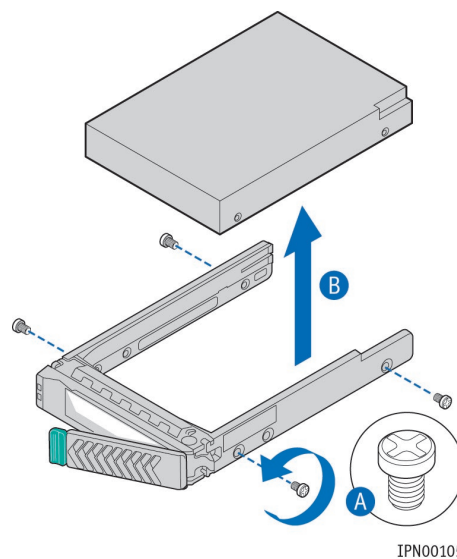
Figure 1: Removing the Drive Carrier



### 3.1.2 Installing a Hard Drive in a Carrier

1. If the drive carrier is empty (that is, if you are installing a drive in it for the first time), remove the black plastic filler panel by unfastening the four screws that attach it to the carrier. (Figure 2, "A"). Set the screws aside for use with the new drive.
2. If a drive is already installed (that is, if you are replacing the drive), remove it by unfastening the four screws that attach the drive to the drive carrier. (Figure 2, "A") Set the screws aside for use with the new drive.
3. Lift the drive (or filler panel) out of the carrier. ("B")

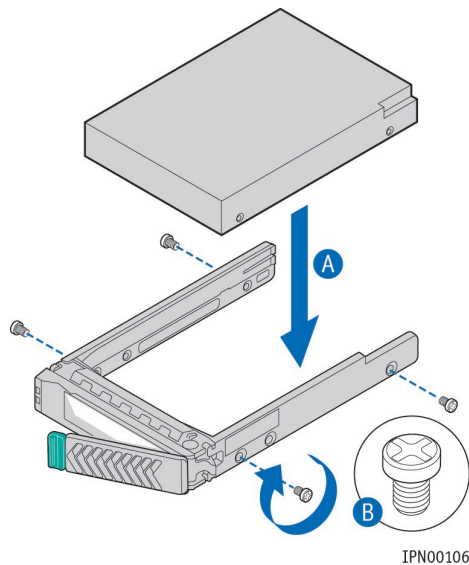
Figure 2: Removing a Hard Drive





4. Install the new drive in the drive carrier (Figure 3, "A") and secure the drive with the four screws that come with the carrier (with 4 lbs-in torque, max). ("B")

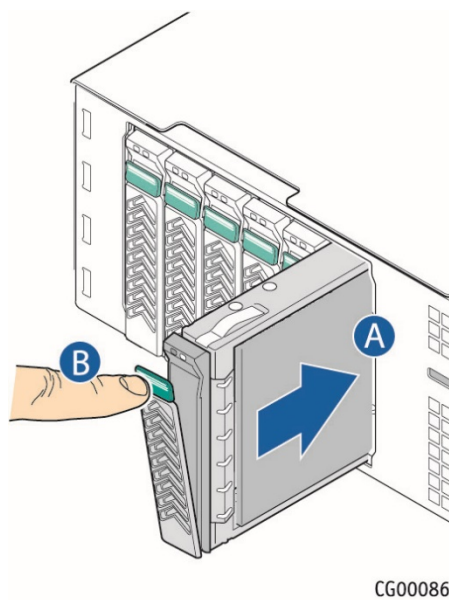
Figure 3: Installing a Hard Drive



5. With the drive carrier locking lever fully open, push the hard drive carrier into the drive slot in the chassis until it stops. (Figure 4 "A")
6. Press the locking lever until it snaps shut and secures the drive in the slot. (Figure 4 "B")

If this is the last task you are doing, replace the front bezel. See (RA) in Chapter 6.

Figure 4: Inserting a New Hard Drive into the Chassis



## 3.2 Replacing System Fans

The fan replacement spare kit for the CG2300 server contains six 80mm fans. Each fan module is exactly like the fans in the server, i.e., the bracket and plastic finger guard are attached. For ordering information, see the *CG2300 Carrier Grade Server Configuration Guide*. The latest version of the Configuration Guide is located on the Kontron support website at <http://kontron.com>. (Rack Mount Systems - CRMS - CG2300 - Ordering Guide). The fans are hot-swappable, so no service interruption is usually required. However, if service interruption is required for installation considerations, fan replacement by a skilled technician should take 15 minutes or less.

**CAUTION:** Because the fans are hot-swappable, you do not need to shut down the server system and disconnect the power and external devices. Instead of removing the chassis cover, as is customary for working with internal components, simply press the blue unlock button on the cover and slide the cover backwards on the shoulder screws to access the fan area.

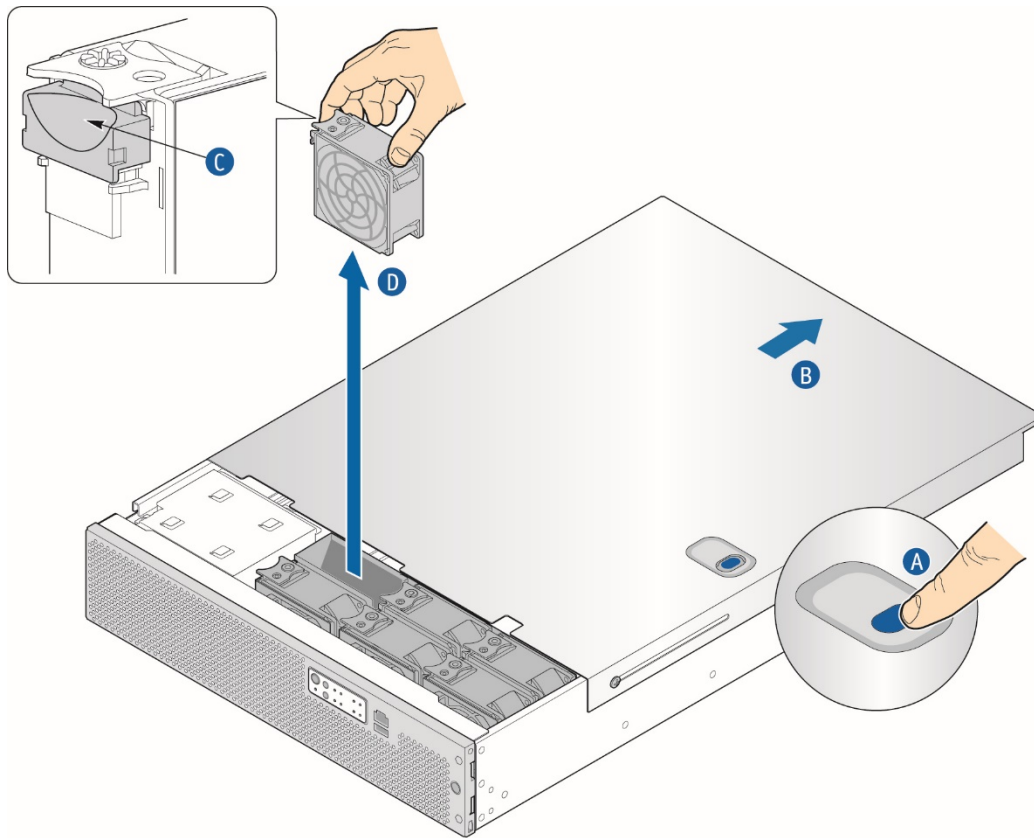
*Do not completely remove the top cover* while the system is running because there is a 12V energy hazard in the server when power is on. If the top cover has been removed to access components internal to the system other than the hot-swappable fans, you must power off the server and unplug the power cords.

The six 80x38mm fans, configured as three redundant pairs are located behind the front panel board. (See XX, "Q") These fans are in front of the support cross bar and the fan control board. They provide cooling for the CPUs, memory DIMMs, PCI riser assemblies, and HDD drives.

To replace a fan:

1. Unfasten the shipping screw, if used, on the left side of the chassis cover.
2. Slide the top cover back to the support cross bar so the fans and the CPU cables behind them are visible.
3. Determine which fan has failed by finding the LED that is amber. (The LED is next to the blue grommet on the top of each fan assembly).
4. Remove the failing fan by grasping both sides of the fan assembly, using the plastic finger guard on the left side and pulling the fan out of the metal enclosure that houses the fans and the power cables. (Figure 5, "C" and "D")

Figure 5: Removing a Hot-Swappable Fan



CG00114

5. Replace the fan by inserting it into the same slot. Use the edges of the metal enclosure to align the fan assembly properly and to make sure the power connector is seated properly in the header on the left side of the metal enclosure.
6. If this is the last task you are performing, close the chassis cover by sliding it forward until it clicks into place. Replace the shipping screw, if used.

## 4 Disassembling Server Components

The following sections present general removal procedures that are required before removing or installing various internal components that are not hot-swappable.

**NOTE:** Each section in this chapter has a letter (A through I) in the title. Tasks in this chapter and Chapter 5 identify the needed disassembly tasks by these letters.

### 4.1 Before Beginning These Tasks

Before working with the server product, pay close attention to the safety instructions provided in this manual. See Appendix A, “Appendix A: Safety Information”

**WARNING:** Electrostatic discharge (ESD) and ESD protection: ESD can damage disk drives, boards, and other parts. We recommend that you perform all procedures in this chapter only at an ESD workstation. If one is not available, provide some ESD protection by wearing an antistatic wrist strap attached to chassis ground (any unpainted metal surface) on the server when handling parts.

**NOTE:** Except where noted, the tasks in this chapter require turning off the server and disconnecting the power cord(s) and any peripheral devices attached to the server.

#### 4.1.1 Tools and Supplies Needed

- » #1 and #2 Phillips (cross-point) screwdrivers (or interchangeable tip screwdriver with #1 and #2 Phillips bits)
- » Personal grounding device such as an anti-static wrist strap and a grounded conductive pad

#### 4.1.2 System References

All references to left, right, front, rear, top, and bottom assume that you are facing the front of the server, as it would be positioned for normal operation.

### 4.2 (A) Removing the Chassis Top Cover

The CG2300 server must be operated with the top cover in place to ensure proper cooling. Always power down the system and remove the top cover to add or replace any components inside the chassis that are not hot-swappable.

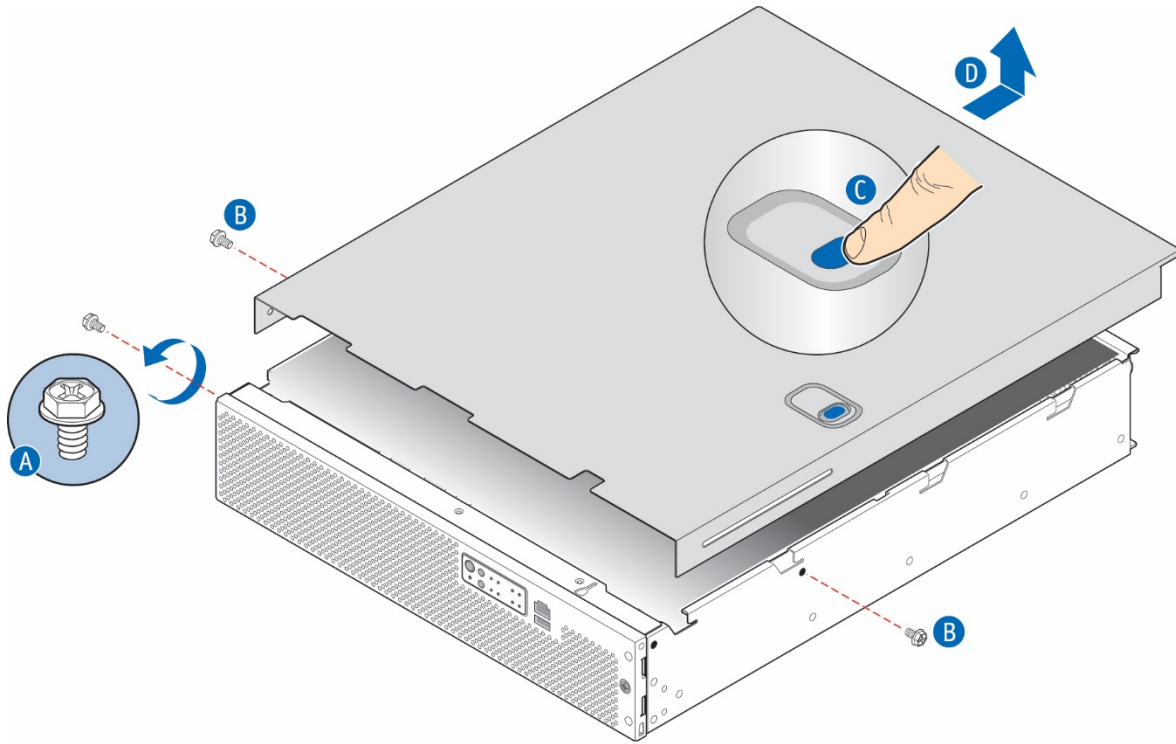
**CAUTION:** 5V standby power is present inside the chassis whenever the power supply module(s) are connected to a power source. Before removing the top cover, always power down the server and unplug all peripheral devices and the power cable(s).

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

Figure 6 shows the top cover and how it is removed. Follow these steps to remove the cover:

1. Remove the hex HD Phillips 6-32 shipping screw at the front left side of the cover, if it is still attached, and save it for future use. (Figure 6, “A”)
2. Remove the two shoulder screws (one on each side) from the cover. (“B”)
3. While holding the blue unlocking button at the middle of the top cover (“C”), slide the cover backwards until it stops and the edge clears the lock bracket on the rear panel of the chassis
4. Lift the cover straight up to remove it from the chassis. (“D”)

Figure 6: Removing the Cover



CG00069

### 4.3 (B) Removing a Riser Card Assembly

One or both of the riser card assemblies has to be removed from the chassis to perform tasks such as:

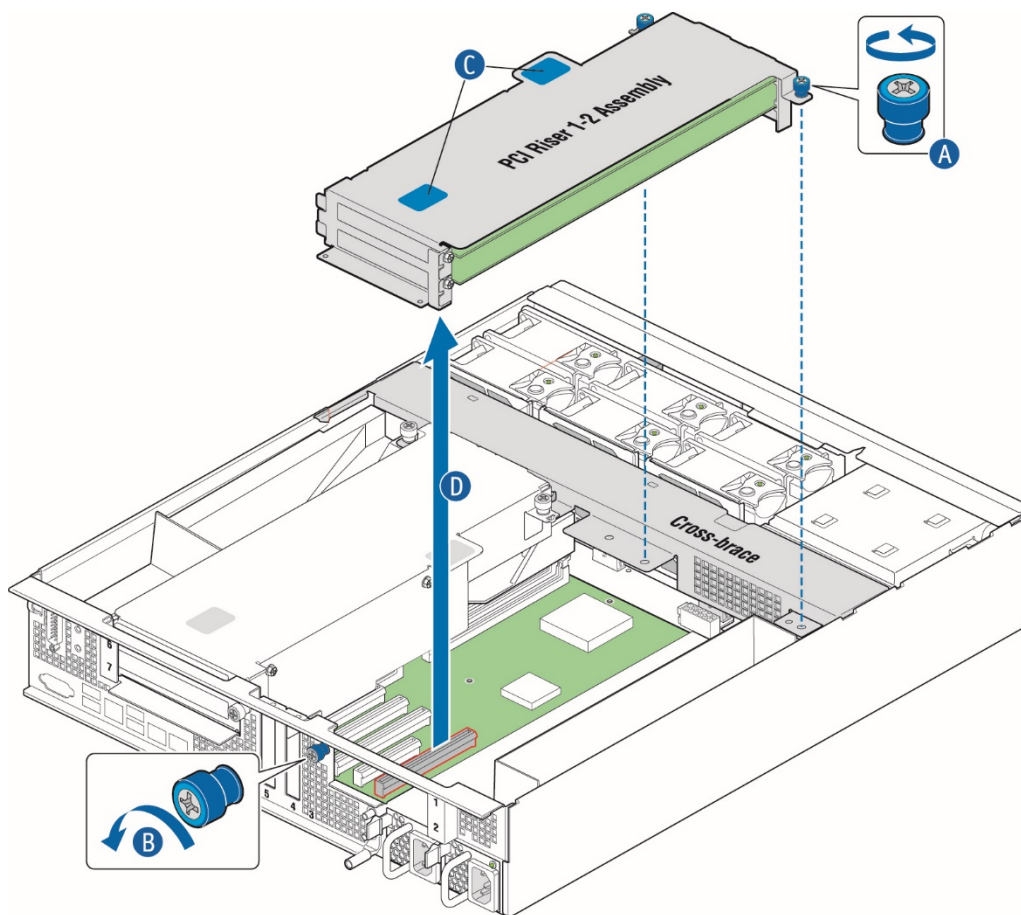
- » Installing or replacing a riser card and any PCIe add-in card(s)
- » Working with any components on the server board that are near the riser card assembly
- » Installing or replacing processors or memory DIMMs
- » Removing the server board

#### 4.3.1 (B1) Removing the Left Riser Card Assembly

Before you can remove the left riser card assembly, you first must power down the server and remove all peripheral devices and power cord(s) and then the chassis cover. For instructions, see (A) in Chapter 4.

1. Loosen the two blue captive retention screws (Figure 7, "A") at the front of the riser assembly and the blue captive screw at the rear of the chassis ("B").
2. Using the two blue touch points ("C"), lift the riser card assembly out of the chassis ("D").

Figure 7: Left Riser Card Assembly



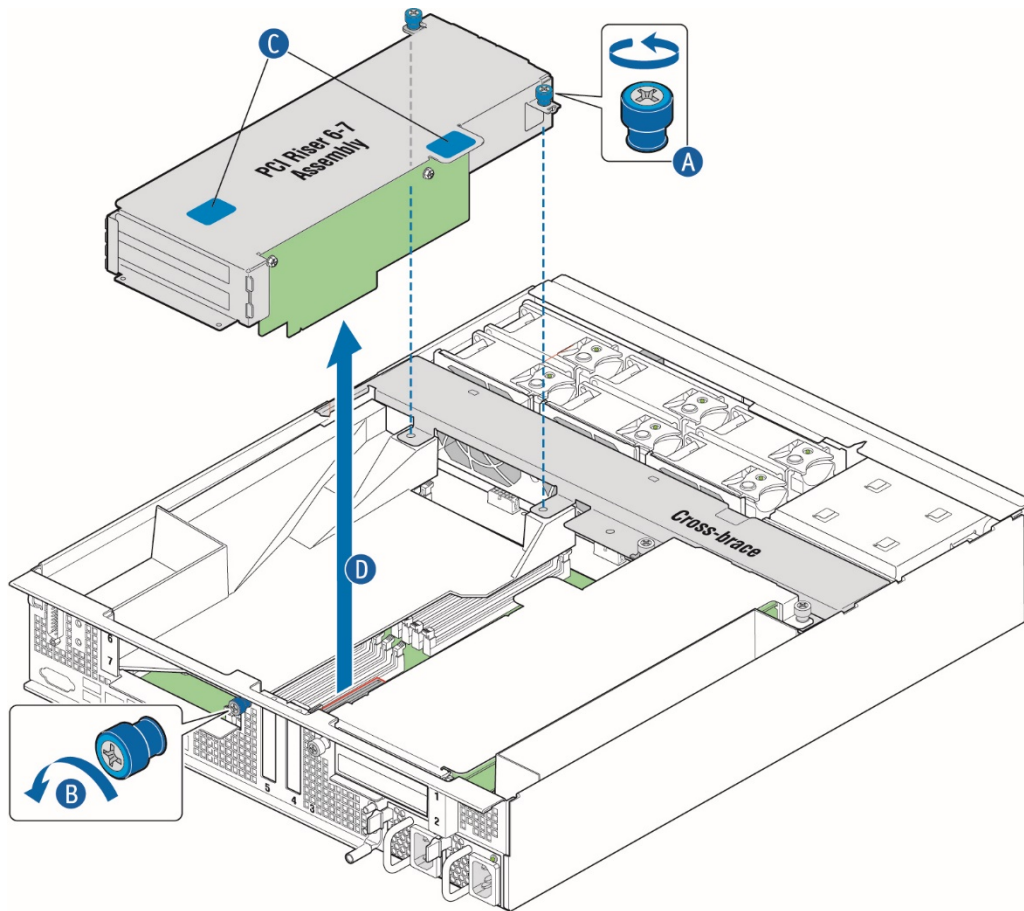
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#### 4.3.2 (B2) Removing the Right Riser Card Assembly

Before you can remove the right riser card assembly, you first must power down the server and remove all peripheral devices and the power cord(s) and then the chassis cover. For instructions, see (A) in Chapter 4.

1. Loosen the two blue captive retention screws (Figure 8, "A") at the front of the riser assembly and the blue captive screw at the rear of the chassis ("B").
2. Using the two blue touch points ("C"), lift the riser card assembly out of the chassis ("D").

Figure 8: Right Riser Card Assembly



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#### 4.4 (C) Removing the Processor Air Duct

The black plastic processor air duct must be removed to access the processors and the memory DIMMs or to replace the server board.

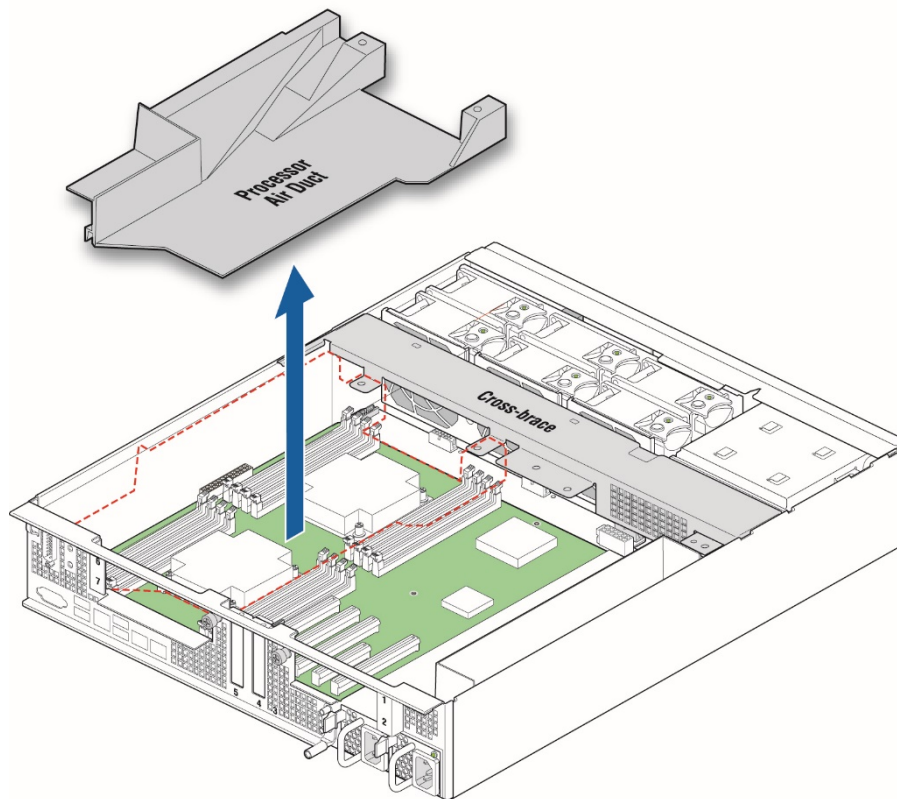
**NOTE:** The air duct is required to ensure proper air flow within the chassis, so be sure that it is in place again before re-installing the chassis cover.

Before you can remove the processor air duct, you first need to power down the server and remove all peripheral devices and power cord(s) and then the chassis cover and right riser card assembly. For instructions, see (A and (B2) in Chapter 4.

To remove the processor air duct, simply lift the air duct straight up out of the chassis.



Figure 9: Removing the Processor Air Duct



CG00352

#### 4.5 (D) Removing the Support Cross Bar

The support cross bar secures several components, some optional, in the chassis. It is the divider between the front and back. The top cover can be pushed back to the cross bar without powering down the system in order to service hot-swappable components in the front of the chassis. In contrast, some components in the front of the chassis, such as the front panel board or the power distribution board, cannot be replaced without first removing the cross bar (along with all the components attached to it). This procedure is necessary in order to have enough space to access these front chassis components.

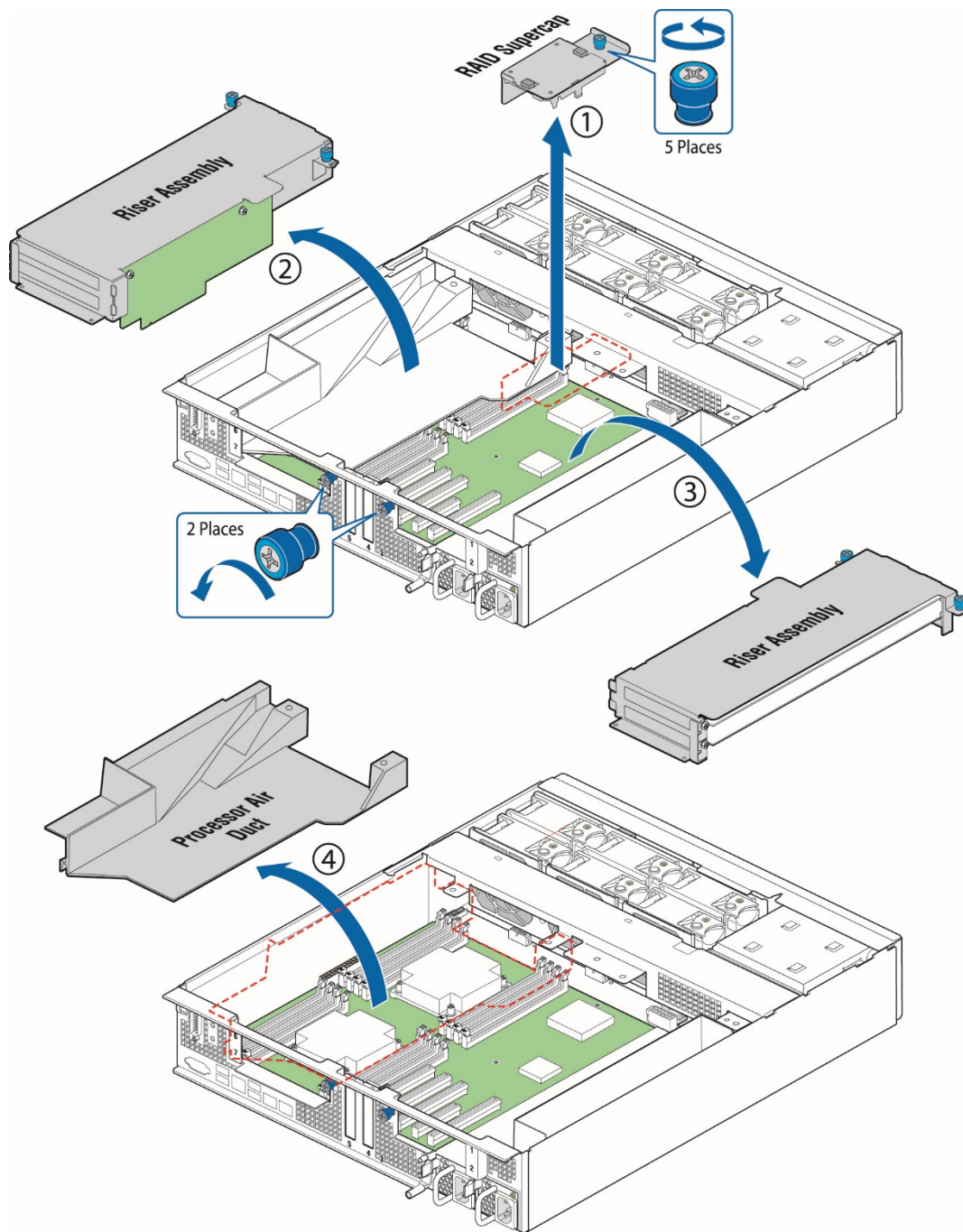
Before you can remove the support cross bar, you first must power down the server and remove all peripheral devices and power cord(s) and then remove the chassis cover. For instructions, see (A) in Chapter 4.

You also need to loosen the blue captive retention screws all along the cross bar and remove any components that are secured by the captive retention screws: the riser card assemblies, the processor air duct, and the optional hardware RAID battery backup assembly. For instructions see (B), (C), and (F) in Chapter 4.

To remove the support cross bar:

Figure 10 shows the location of all the components that have to be removed in order to remove the support cross bar.

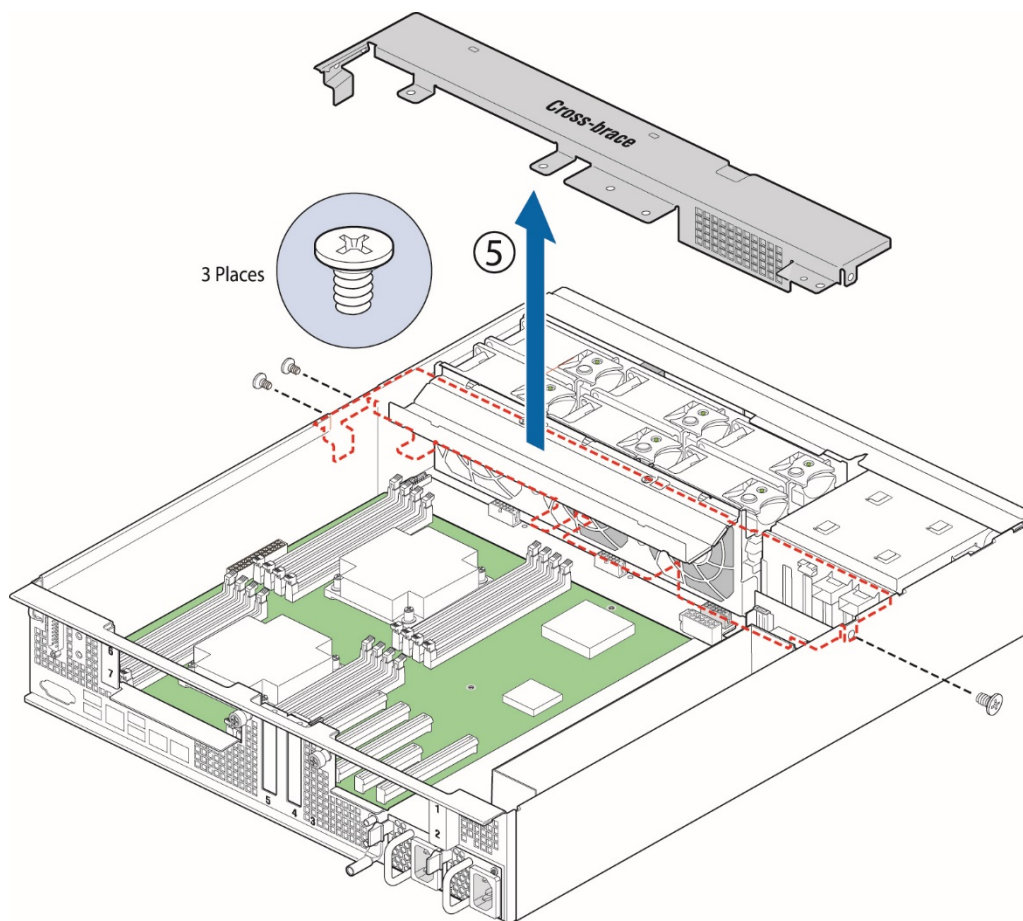
Figure 10: Disconnecting Components from the Support Cross Bar



CG00365

1. Remove the small flat screws that fasten the cross bar to the sides of the chassis. There is one screw on the left side and two on the right side. (Figure 11)
2. Remove the support cross bar from the chassis and set it aside. (Figure 11)

Figure 11: Removing the Support Cross Bar from the Chassis



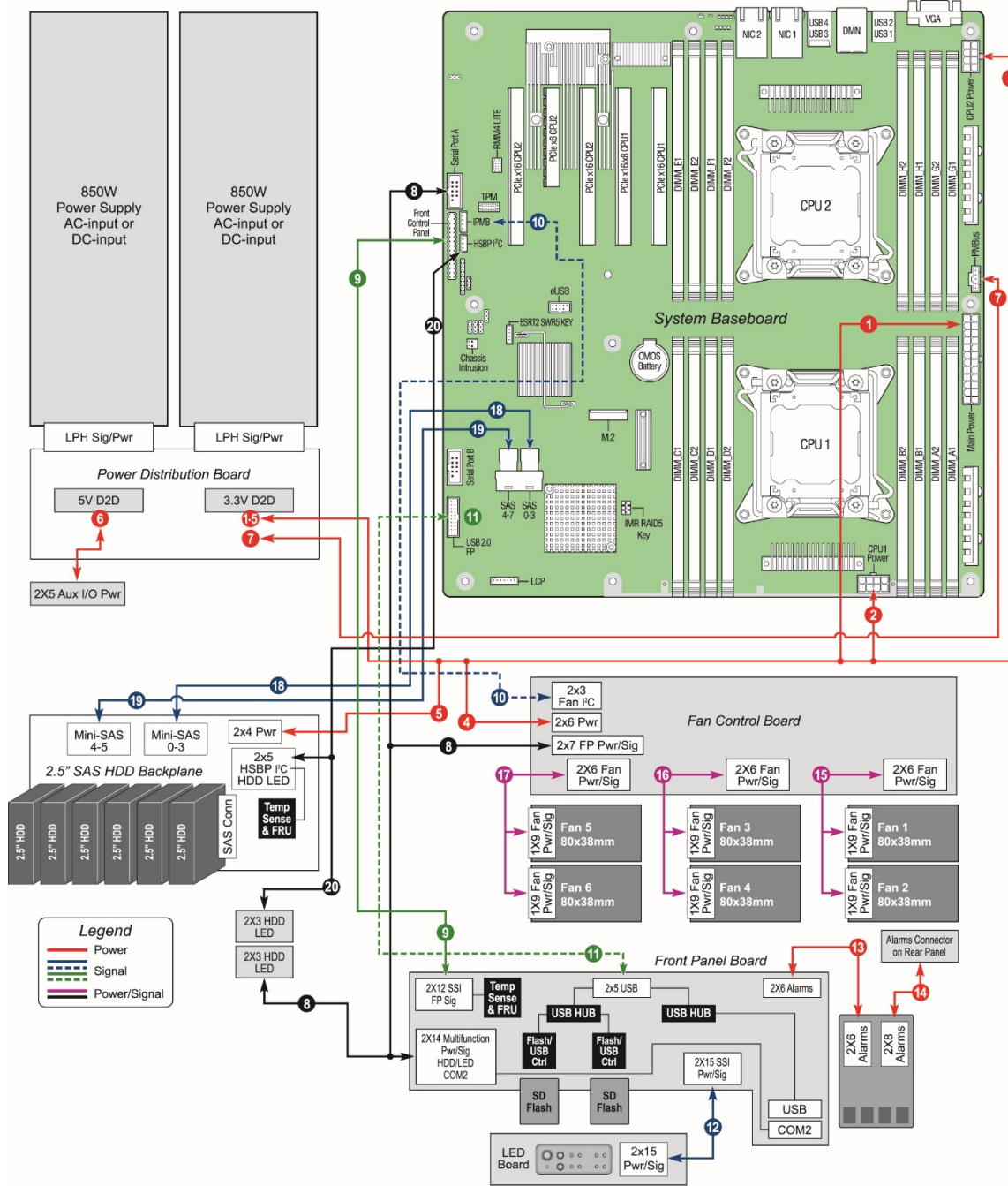
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## 4.6 (E) Disconnecting Cables

Cables must be disconnected in order to do several different tasks inside the CG2300 server. Figure 12 and Table 1 show all of the cable connections in the system.

Before you can disconnect any internal cables, you first must power down the server and remove all peripheral devices and power cord(s) and then remove the chassis cover. For instructions, see (A) in Chapter 4.

Figure 12: Cable Routing



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Table 1 provides information about each of the numbered connections in Figure 12.

Table 1: Cable Connections

Interconnect Number and Name	Connections
1. Baseboard SSI Main Power Provides power to the baseboard and the power supply with the PS-ON signal	Power Distribution Board 3.3V D2D (soldered) to Baseboard MAIN_PWR (J9G1)
2. CPU 1 and DIMM Power Provides power for CPU 1 and the DIMMs associated with CPU 1	Power Distribution Board 3.3V D2D (soldered) to Baseboard CPU_1_PWR (J8K2)



Interconnect Number and Name	Connections
3. CPU 2 and DIMM Power Provides power for CPU 2 and the DIMMs associated with CPU 2	Power Distribution Board 3.3V D2D (soldered) to Baseboard CPU_2_PWR (J9A2)
4. Fan Control Board Power Provides power for the fan control board and the six 80mm system fans	Power Distribution Board 3.3V D2D (soldered) to Fan Control Board Power (J9A2)
5. SAS HDD Backplane Board Power Provides power for the HDD backplane board and up to six SAS HDDs	Power Distribution Board 3.3V D2D (soldered) to SAS HDD Backplane Power (J11)
6. Aux I/O Power Dongle Provides power to a 10-pin connector where customers can connect a custom cable of their own design to provide auxiliary power to high-power PCIe adapters	Power Distribution Board 5V D2D (soldered) to Cable-to-Cable NC (custom connection)
7. Baseboard SSI Power Control Signal Provides PMBus signals between the power supplies and the baseboard	Power Distribution Board 3.3V D2D (soldered) to Baseboard PMBUS (J9E1)
8. Multifunction Front Panel Board (Power and Signal, HDD LED, COM2) Interconnects the front panel board, fan control board, baseboard, and the HDD LEDs (C-2-C)	Front Panel Board (multifunction) to Fan Control Board PWR/SIG (J1A1), Baseboard SERIAL_A, and C-2-C HDD LED (NC)
9. SSI Front Panel Board Connects the front panel board with the baseboard	Baseboard SSI_FRONT_PANEL (J1A2) to Front Panel Board SSI signal (J1)
10. Fan I <sup>2</sup> C Connects the baseboard and the fan control board to provide fan control signals	Baseboard IPMB (J1D4) to Fan Control Board I <sup>2</sup> C (J8A1)
11. Front Panel Board USB Connects the baseboard to the front panel board to provide USB 2.0 signals	Baseboard USB_5-6 (J1K1) to Front Panel Board USB (J4)
12. LED/Switch Board Power and Signal A power and signal cable that connects the LED/switch board to the front panel board	Front Panel Board SSI PWR/SIG (J2) to LED/Switch Board PWR/SIG (J1)
13. TAM Signal A signal cable that connects the TAM board to the front panel board	Front Panel Board Alarms (J3) to TAM Module Alarms (J2)
14. Alarms Connects the TAM board to the chassis rear panel alarms connector	TAM Module Alarms(J1) to System Rear Panel Alarms Connector (the DB-15)
15. Fan Pair (Fans 1-2) Connects system fans 1 -2 to the fan control board	Fan Control Board PWR/SIG(J3A1) to Fan Pair (1-2) PWR/SIG (mechanically, only possible fit)
16. Fan Pair (Fans 3-4) Connects system fans 3-4 to the fan control board	Fan Control Board PWR/SIG (J6A1) to Fan Pair (3-4) PWR/SIG (mechanically, only possible fit)
17. Fan Pair (Fans 5-6) Connects system fans 5-6 to the fan control board	Fan Control Board PWR/SIG (J9A1) to Fan Pair (5-6) PWR/SIG (mechanically, only possible fit)
18 SAS 1 (HDD 0-3) Connects the HDD backplane board to the SAS HDD 0-3 connector on the baseboard	SAS HDD Backplane MINISAS0 (J1) to Baseboard SAS_0-3 (J1H3) or the proper port mapping on the optional hardware RAID controller board
19. SAS 2 (HDD 4-5) Connects the HDD backplane board to the SAS HDD 4-7 connector on the baseboard (for HDDs 4-5)	SAS HDD Backplane Board MINISAS1 (J3) to Baseboard SAS_4-7 (J1H3) or the proper port mapping on the optional hardware RAID controller board
20. HSBP I <sup>2</sup> C/HDD LED Connects the HDD HSBP (hot-swap backplane) board to the baseboard and	SAS HDD Backplane Board HSBP I <sup>2</sup> C (J2) to Baseboard HSBP I <sup>2</sup> C (J1D3) and Front Panel Board C-2-C (HDD-LED).

Interconnect Number and Name	Connections
front panel board to provide HDD LED signal control on the disk drive carriers and on the system front panel	

#### 4.6.1 (E1) Disconnecting Baseboard Power Side Cables

The four baseboard power side cables all run from the power distribution board, across the cable bundle bracket in protective covers, to their connectors on the baseboard.

The baseboard power cables need to be disconnected on the baseboard side (soldered on the PDB side) before performing tasks such as replacing the power distribution board or replacing the server board. Because these baseboard power cables are carried on the cable bundle bracket, they also need to be disconnected for any task that requires the fan cage/cable bracket assembly to be removed from the chassis.

Before you can disconnect the baseboard power cables from their baseboard connectors, you must first remove the right riser card assembly, the processor air duct and the support cross bar. For instructions, see (B2), (C), and (D) in Chapter 4.

##### Disconnecting Main Power

The baseboard SSI main power cable provides power to the baseboard and the power supply with the “PS-ON” signal from the power distribution board. The cable is soldered to the PDB and connected to MAIN\_PWR (J9G1).

For the location of the connector on the baseboard, see Figure 12 in this section (E).

To disconnect the main power cable

1. If present, uncover the black insulator covering the power cable bundles in the cable bracket. See Figure 13.
2. Disconnect the main power cable bundle from the baseboard and pull it to the side of the system.  
(Since the cable is soldered onto the power distribution board, it cannot be removed from the chassis, but you can pull it over to the left side, out of the way, when working with components in the front of the chassis.)

##### Disconnecting the PMBus (SSI Power Control) Cable

This cable sends PMBus signals between the power supplies and the baseboard. It is soldered on the PDB side and connects to the baseboard PMBus connector (J9E1) on the other end.

For the location of the PMBus connector on the baseboard, see Figure 12 in this section (E).

To disconnect the PMBus cable:

1. If present, uncover the black insulator covering the power cable bundles in the cable bracket under the cross bar. See Figure 13.
2. Disconnect the PMBus power cable from the baseboard and pull it to the side of the system.  
(Since the cable is soldered onto the power distribution board, it cannot be removed from the chassis, but you can pull it over to the left side, out of the way, when working with components in the front of the chassis.)

##### Disconnecting the CPU 1 and CPU 2 Power Connectors

The CPU1 and CPU2 power cables bring power from the power distribution board to the CPUs (and their DIMMs). The CPU1 cable connects to the baseboard at the front of the board near the CPU1 DIMMs, (CPU\_1\_PWR, J8K2). The CPU2 cable is routed through another black insulator along the right chassis wall to a connector at the rear right side of the board, (CPU\_1\_PWR, J9A2).

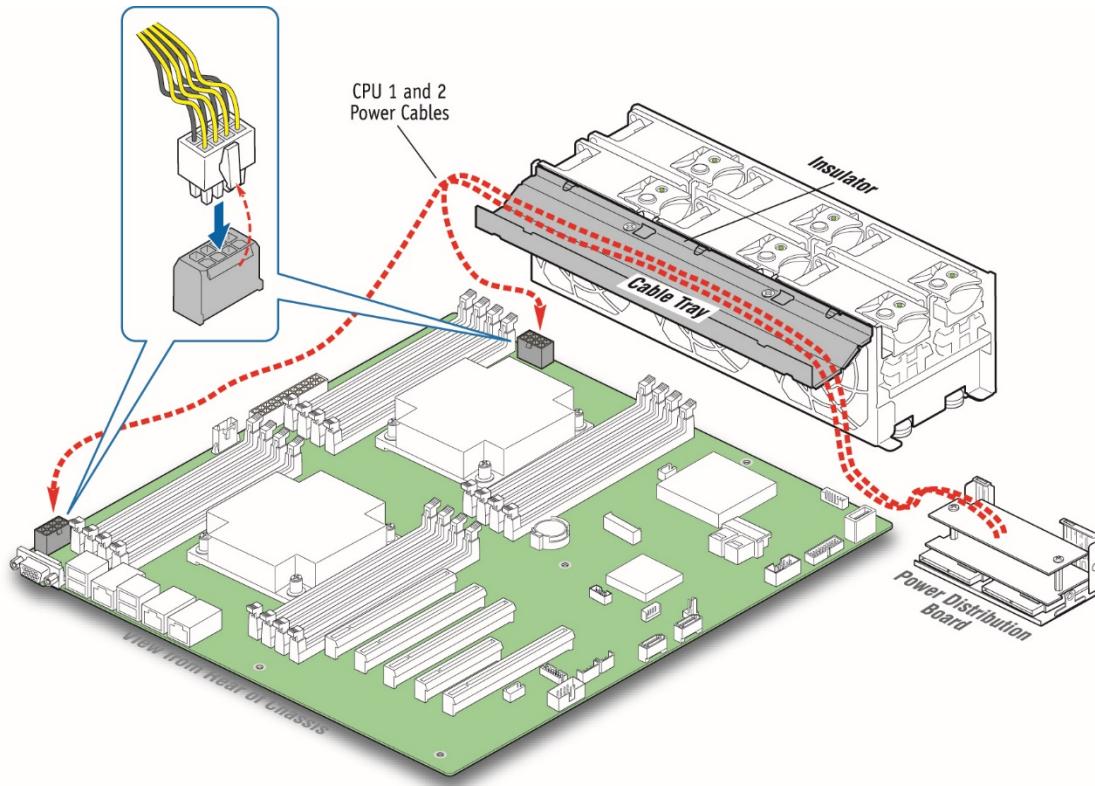
For the locations of these cables, see Figure 12 in this section (E).

**NOTE:** Besides the components already mentioned, you may find you also need to remove the cable bundle bracket/fan cage assembly in order to access the CPU1 cable connector on the baseboard. For instructions, see (G) in Chapter 4.

To disconnect the CPU1 and CPU2 power cables:

1. If present, uncover the black insulator covering the CPU 1 and CPU 2 power cable bundles in the cable bracket. (Figure 13)
2. Disconnect the CPU power cables from the baseboard and pull them to the side of the system. (Since the cables are soldered onto the power distribution board, they cannot be removed from the chassis, but you can pull them over to the left side, out of the way, when working with components in the front of the chassis.)

Figure 13: Disconnecting the CPU Power Cables



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## 4.6.2 Disconnecting Baseboard Signal Side Cables

Signal cables connect to the baseboard on the left side. See Figure 12 in this section (E).

Before you can disconnect any baseboard signal cables, you must first power down the server and remove all peripheral devices and power cord(s) and then remove the chassis cover and the left riser card assembly. For instructions, see (A) and (B1) in Chapter 4.

### (E2) Baseboard to Front Panel Board Signal Cables

These cables all have a baseboard connection and a front panel board connection.

Before you can disconnect any of these baseboard-to-FPB cables from the front panel board (FPB), you must first remove all the things that are in the way for working on the FPB: the support cross bar and the components attached to it, the cable bundles in the cable bracket, and the cable bracket/fan cage. For instructions, see (D), (E1), and (G) in Chapter 4.

### SSI Front Panel Board Cable



The SSI signal cable must be disconnected in order to perform tasks such as replacing the front panel board or replacing the server board.

The SSI front panel board signal cable connects the front panel board connector (J1) with the baseboard (SSI\_FRONT\_PANEL, J1A2).

For the location of the baseboard SSI front panel board connector, see Figure 12 in this cable section (E).

For the location of the SSI power control signal connector on the FPB, see Figure 39 in Section 5.2.14.

### Serial Cable

In order to remove the server board, you need to disconnect the serial cable, which is part of the multifunction front panel board power and signal cable, from the baseboard. Since this cable is part of the multifunction front panel board cable, you also need to disconnect it to replace the fan control board, or to work with the HDD LEDs.

As part of the multifunction front panel board cable, along with the HDD LED cable and COM2, the serial cable interconnects the front panel board (FPB) with the fan control board, the baseboard, and the HDD LEDs. For the location of the multifunction cable connector on the FPB (J1A1), see Figure 39 in Section 5.2.14. For the location of the serial connector on the baseboard (SERIAL\_A), see Figure 12 in this section (E).

### Front Panel Board USB Cable

The USB cable has to be disconnected in order to perform tasks such as replacing the front panel board or replacing the server board.

The front panel board USB cable connects the baseboard to the FPB to provide USB 2.0 signals.

For the location of the baseboard USB connector (USB-5-6, J1K1), see Figure 12 in this section (E). For the location of the USB connector on the FPB (J4), see Figure 39 in Section 5.2.14.

## (E3) Other Baseboard Signal Cables

### IPMB/Fan I<sup>2</sup>C Cable

The IPMB cable (aka Fan I<sup>2</sup>C) has to be disconnected in order to perform tasks such as replacing the server board or replacing the fan control board.

The IPMB cable connects the baseboard with the fan control board (FCB) to provide fan control signals. For the location of the IPMB connector (J1D4) on the baseboard, see Figure 12 in Chapter 4. For the FCB I<sup>2</sup>C connector (J8A1), see Figure 43 in Section 5.2.17.

Before you can disconnect the IPMB/Fan I<sup>2</sup>C connector on the FCB, you need to remove everything that is in the way for working on the FCB: the support cross bar, the baseboard power cables, the cable bundle bracket/fan cage. For instructions, see (D), (E1), and (G) in Chapter 4.

### HSBP I<sup>2</sup>C Cable

The HSBP I<sup>2</sup>C cable has to be disconnected in order to perform tasks such as replacing the SAS backplane, the front panel board, or the server board.

The HSBP I<sup>2</sup>C cable connects the HDD HSBP (hot-swap backplane) to the baseboard and the front panel board to provide HDD LED signal control on the disk drive carriers and on the system front panel. For the location of the HSBP I<sup>2</sup>C connector (J2) on the HDD backplane, see Figure 16 in Section 5.2.20. For the location of the HSBP I<sup>2</sup>C/HDD LED connector (HDD-LED) on the FP board, see Figure 39 in Section 5.2.14. For the location of the HSBP I<sup>2</sup>C connector (J1D3) on the baseboard, see Figure 12 in Chapter 4.

Before you can disconnect the HSBP I<sup>2</sup>C/HDD LED cable from the SAS backplane, you must first remove the front bezel, the active HDD carriers from the drive bay, and the HSBP backplane and air duct from the SAS HDD drive bay assembly. For instructions, see (I) and (H) in Chapter 4.

Before you can disconnect the HSBP I<sup>2</sup>C cable from the FP board, you need to remove everything that is in the way for working on the front panel board: the support cross bar, the power cable bundles in the cable bracket, and the cable bundle bracket/fan cage assembly. For instructions, see (D), (E1), and (G) in Chapter 4.

#### (E4) HSBP Cables

The HSBP cables have to be disconnected from the baseboard in order to perform tasks such as installing a hardware RAID controller or replacing the server board or power distribution board.

The HSBP cables have to be disconnected from the HSBP board on the SAS drive bay assembly to replace the PDB or to remove or replace the HSBP board.

The hot-swap backplane at the back of the SAS HDD drive bay assembly has the following cables connected:

- » SAS HDD Backplane board power cable that provides power from the PDB to the HSBP and up to six SAS HDDs  
For the location of the power connector (J11) on the HSBP, see Figure 16 in (H) in Chapter 4. The other end of this cable is soldered onto the PDB.
- » SAS-1 (HDD 0-3) cable that connects the HSBP board to the SAS\_0-3 connector on the baseboard or to an optional hardware RAID controller board  
For the location of the SAS-1 connector (MINISAS0, J1) on the HSBP, see Figure 16 in (H) in Chapter 4. For the location of the SAS\_0-3 connector (J1H3) on the baseboard, see Figure 12 in this section (E).  
For the location of the SAS-1 connector on a hardware RAID controller card, see Figure 30 in Section 5.2.7 “Installing a Hardware RAID Controller”.
- » SAS-2 (HDD 4-5) cable that connects the HSBP board to the SAS\_4-7 connector on the baseboard or to an optional hardware RAID controller board  
For the location of the SAS-2 connector (MINISAS1, J3) on the HSBP, see Figure 16 in (H) in Chapter 4. For the location of the SAS\_4-7 connector (J1H3) on the baseboard, see Figure 12 in this section (E).  
For the location of the SAS-1 connector on a hardware RAID controller card, see Figure 30 in Section 5.2.7 “Installing a Hardware RAID Controller”.

Before you can disconnect the SAS-1 and SAS-2 cables from the baseboard, you need to remove the left riser card assembly. For instructions, see (B1) in Chapter 4.

Before you can disconnect the HSBP SAS-1 and SAS-2 cables and the HSBP power cable from the HSBP board, you must first remove the front bezel, the active HDD carriers from the drive bay, and the HSBP backplane and air duct from the SAS HDD drive bay assembly. For instructions, see (I) and (H) in this chapter.

#### (E5) Fan Control Board Cables

The fan control board cables have to be disconnected in order to perform tasks such as replacing the front panel board (FPB), removing or replacing the fan control board (FCB), or replacing the power distribution board (PDB).

The fan control board has the following cables:

- » Fan Control Board PWR/SIG cable, which is part of the FPB multifunction connection that coordinates signals to the front panel  
For the location of the FCB PWR/SIG connector (J1A1) on the FCB, see Figure 43 in Section 5.2.17.
- » Fan I<sup>2</sup>C cable, which connects the baseboard and the fan control board to provide fan control signals  
NOTE: This cable, also known as the IPMB cable, is covered in (E3) in this section (E).
- » Fan (Fans 1-2), Fan (Fans 3-4), Fan (Fans 5-6) cables, which each connect the FCB with a fan pair in the fan cage.  
For the location of the three fan pair connectors (J3A1, J6A1, J9A1) on the FCB, see Figure 43 in Section 5.2.17.  
These cables are connected mechanically on the fan pairs in the fan cage.
- » Fan Control Board Power cable, which provides power from the PDB (soldered) to the FCB and the six fans  
For the location of the FCB power connector (J9A2) on the FCB, see Figure 43 in Section 5.2.17.

Before you can disconnect the FCB PWR/SIG cable (part of FPB multifunction cable), the FCB power cable, and the three fan pair cables from the FCB, you need to remove everything that is in the way for working on the FCB: the support cross bar, the baseboard power cable bundles, and the cable bracket/fan cage assembly. For instructions, see (D), (E1), and (G) in Chapter 4.

## 4.7 (F) Removing the SuperCap Battery Backup

The optional RAID battery backup, if installed, has to be removed to install or remove components on that area of the baseboard, such as installing an eUSB module, or removing the support cross bar, as it is one of the components attached to the cross bar.

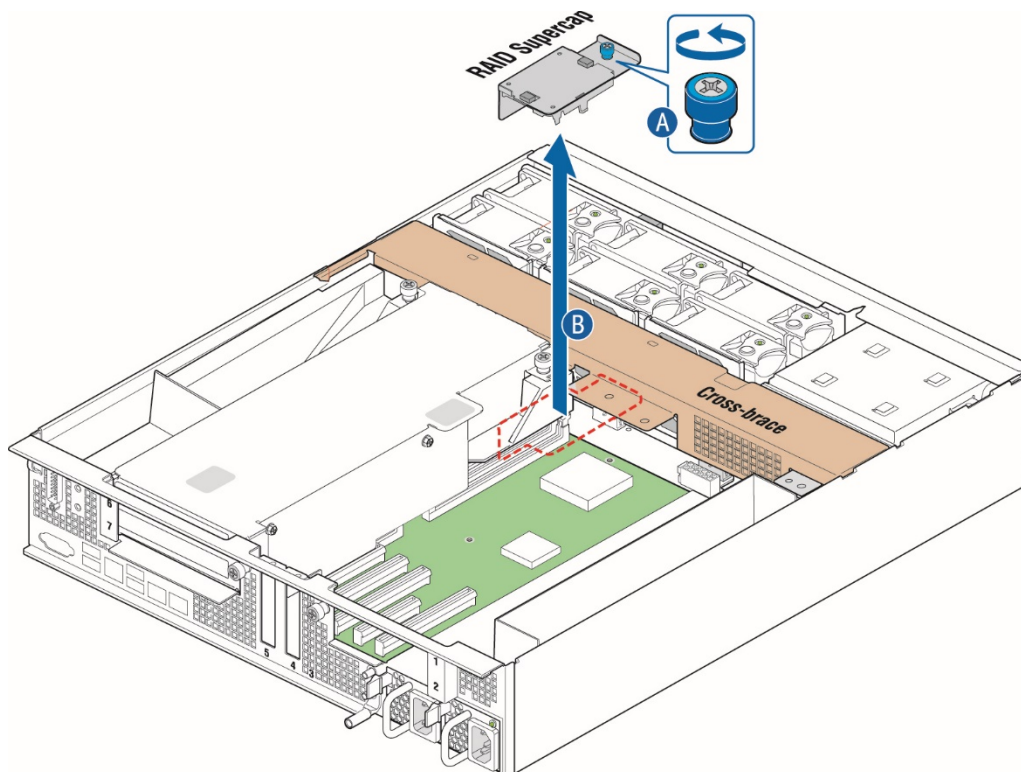
Installing the SuperCap battery backup module entails fastening it to the support cross bar. For that reason, it has to be removed anytime the cross bar is removed. Figure 14 shows the location of the battery backup module as installed on the cross bar. Figure 31 shows how the battery backup is connected to the hardware RAID controller, so it can be disconnected.

Before you can disconnect the battery backup module from the baseboard, you must first remove the chassis cover and the left riser card assembly. For instructions, see (A) and (B1) in Chapter 4.

To remove the battery backup module:

1. Loosen the captive screw that fastens the battery backup to the support cross bar. (Figure 14, "A")
2. Lift the assembly up and out of the chassis. ("B")

Figure 14: Removing the Battery Backup



CG00381

## 4.8 (G) Removing the Cable Bundle Bracket and Fan Cage

Both the cable bundle bracket and the fan cage have to be removed in order to perform tasks such as replacing any of the boards in the front of the server: the front panel board, the LED/switch board, the telco alarms module, or the fan controller board as well as working on components or connectors on the server board front edge, or replacing the server board.

The cable bundle bracket is under the support cross bar and just behind the fan cage. It is attached to the fan cage by two small screws. Because both of these components need to be removed and are fastened together, they are treated as one assembly.

Before you can remove the cable bundle bracket/fan cage, you must first remove (and unplug where applicable)

- » the chassis cover
- » All six fans from the cage. Set the fans aside.
- » The support cross bar and all the components attached to it
- » The four power cable bundles. Move them away from the FCB.
- » All three fan cables from the fan control board.

For instructions, see (A), (D), (E1), and (E5) in Chapter 4.

To remove the fan cage:

1. Unfasten the two screws that fasten the fan cage to the chassis floor. Pull the cage up out of the chassis and set it and the screws aside.

## 4.9 (H) Removing the SAS Hot-Swap Backplane (HSBP) Board

The HSBP board has to be removed in order to perform tasks such as replacing the HSBP board or replacing the PDB.

**CAUTION:** Before removing or replacing any of the boards on the CG2300 server, you must first take the server out of service, turn off all peripheral devices connected to the server, turn off the server by pressing the power button, and unplug the power cord(s) from the system and wall outlet.

When handling the SAS backplane board, observe the normal safety and ESD precautions. See “Appendix A: Safety Information” for more information.

The six-slot SAS backplane board is located at the rear of the HDD drive bay assembly. It is held in place by a cover plate on top of the HDD bay assembly that goes over the top edge of the backplane board. There is also a black plastic air duct surrounding the drive bay on the right side and rear of the assembly.

Before you can remove the HSBP board, you must first remove the chassis cover and front bezel. For instructions, see (A) and (I) in Chapter 4.

Once you have removed the HSBP board from the drive bay assembly, you need to remove the four cables connected to the board:

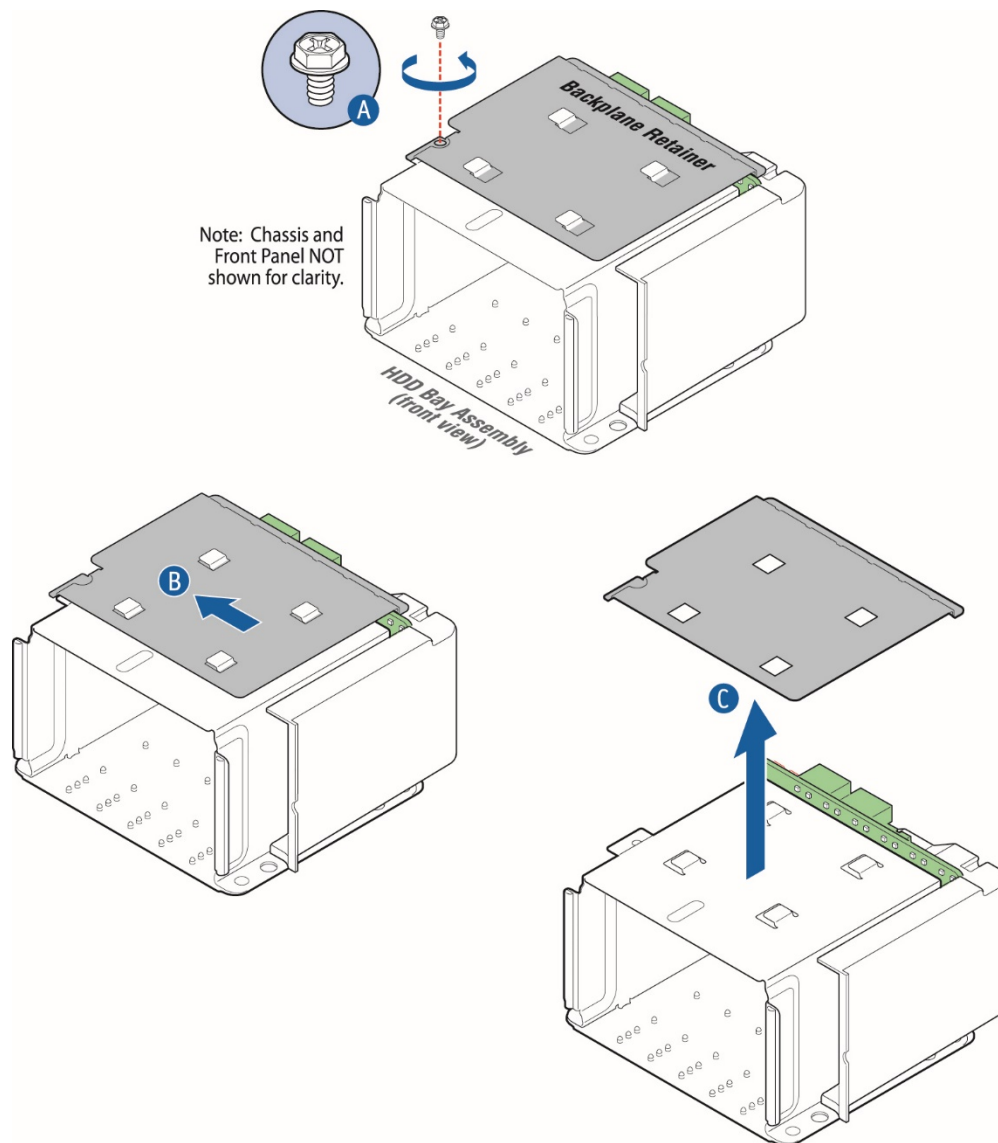
- » SAS HDD backplane board power cable.
- » SAS 1 and SAS 2 cables
- » HSBP I<sup>2</sup>C/HDD LED cable

For instructions, see (E3) and (E4) in Chapter 4.

To remove the HSBP board:

1. Slide any hard disk drives out from the drive bay slots to disengage them from the backplane.
2. Remove the cover plate on the HDD bay assembly by loosening the screw that fastens it to the drive bay and sliding it to the left towards the chassis wall to release the tabs. (Figure 15, “A” and “B”)
3. Lift the cover plate off of the HDD bay assembly. (“C”)

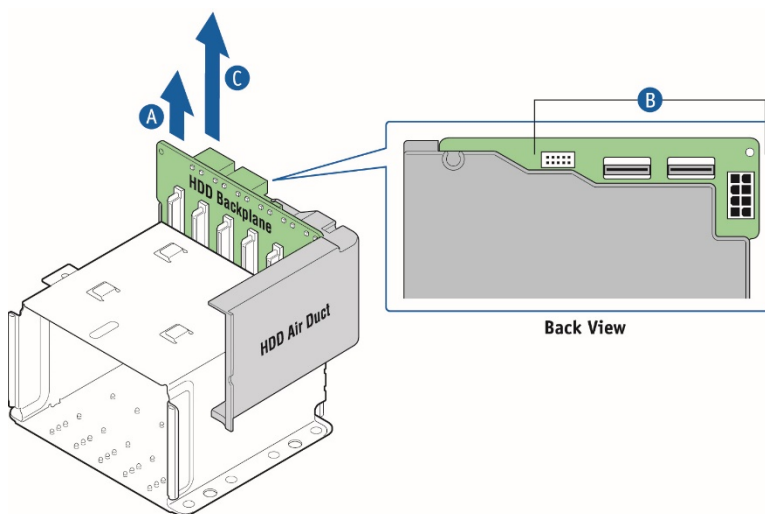
Figure 15: Removing the Cover Plate



CG00095

4. Lift the backplane board and HDD air duct assembly up to access the connectors on the back of the board. (Figure 16, "A").
5. Disconnect the four cables attached to the backplane board ("B").
6. Lift the backplane board and air duct up and out of the chassis. ("C").

Figure 16: Removing the Backplane Board



CG00096

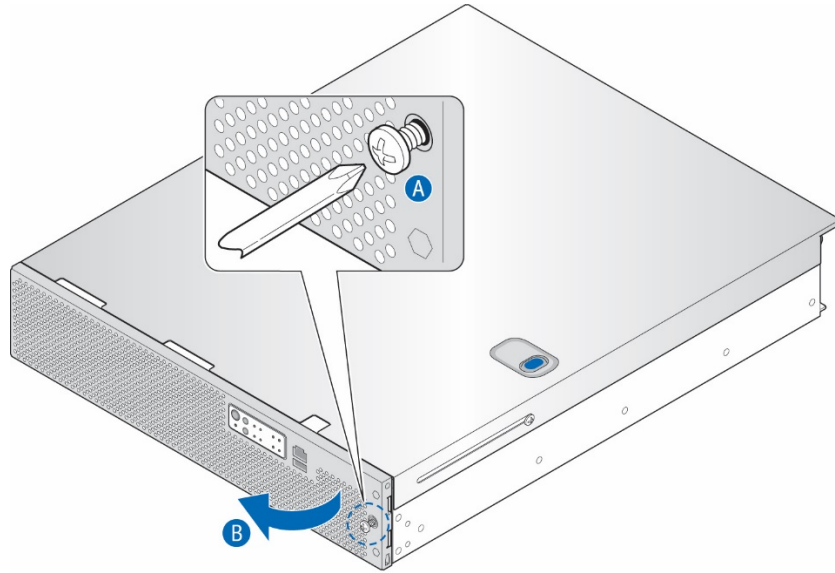
#### 4.10 (I) Removing the Front Bezel

The front bezel has to be removed in order to perform tasks such as:

- » Installing or removing hot-swappable hard disk drives or an SD flash card
- » Observing the individual hard disk drive activity/fault indicators
- » Replacing the control panel LED/switch board

**NOTE:** The system does not have to be powered down just to remove the front bezel.

1. Loosen the captive bezel retention screw on the right side of the bezel (Figure 17, "A").
2. Rotate the bezel to the left to free it from the pins on the front panel, ("B") and remove it.

**Figure 17: Removing the Front Bezel**

CG00070

## 5 Installation and Maintenance Tasks

This chapter covers separately-orderable components that you may want to add or replace in your Kontron CG2300 Carrier Grade Server. Most of these components can be ordered as accessories from Kontron and some are from third party vendors. For more information about what is available from Kontron, see the *CG2300 Carrier Grade Server Configuration Guide*. For a list of qualified third party vendors, see the *Tested Hardware and Operating System List* (THOL). The latest version of the Configuration Guide is located on the Kontron support website at <http://kontron.com> (Rack Mount Systems - CRMS - CG2300 - Ordering Guide). The latest version of the THOL is located on the support website at <http://kontron.com> (Rack Mount Systems - CRMS - CG2300 - Test Hardware and Operating System List (THOL)).

### 5.1 Before Beginning These Tasks

Before working with the server product, pay close attention to the safety instructions provided in this manual. See Appendix A: Safety Information”.

**WARNING:** Electrostatic discharge (ESD) and ESD protection: ESD can damage disk drives, boards, and other parts. We recommend that you perform all procedures in this chapter only at an ESD workstation. If one is not available, provide some ESD protection by wearing an antistatic wrist strap attached to chassis ground (any unpainted metal surface) on the server when handling parts.

#### 5.1.1 Tools and Supplies Needed

- » #1 and #2 Phillips (cross-point) screwdrivers (or interchangeable tip screwdriver with #1 and #2 Phillips bits)
- » Personal grounding device such as an anti-static wrist strap and a grounded conductive pad

#### 5.1.2 System References

All references to left, right, front, top, and bottom assume that you are facing the front of the server, as it would be positioned for normal operation.

### 5.2 Tasks with the Chassis Cover Removed

**NOTE:** Because all the tasks in this section involve components inside the chassis, always power down the server and disconnect the power cord(s) and any peripheral devices connected to the system.

#### 5.2.1 Configuring Memory DIMMs

The memory DIMM slots are located in four separate banks on the S2600CW2SK server board. Detailed information about the memory subsystem in the CG2300 server can be found in the *Intel® Server Board S2600CW2SK Family Technical Product Specification* located on the Kontron support <http://kontron.com>. (Rack Mount Systems - CRMS - CG2300 - Technical Product Specification (TPS) - Motherboard).

#### 5.2.2 Installing Memory DIMMs

Before you can install memory DIMMs in the server, you first need to remove the chassis cover, the right-side riser card, and the processor air duct. For instructions, see (A), (B1), and (C) in Chapter 4.

**NOTE:** To reduce the risk of electrostatic discharge (ESD) damage to the processor or the DIMM, be sure to follow these procedures:

- » Touch the metal chassis before touching the DIMM or server board.
- » Keep part of your body (hand, etc.) in contact with the metal chassis to dissipate the static charge while handling the DIMM.
- » Avoid moving around unnecessarily.

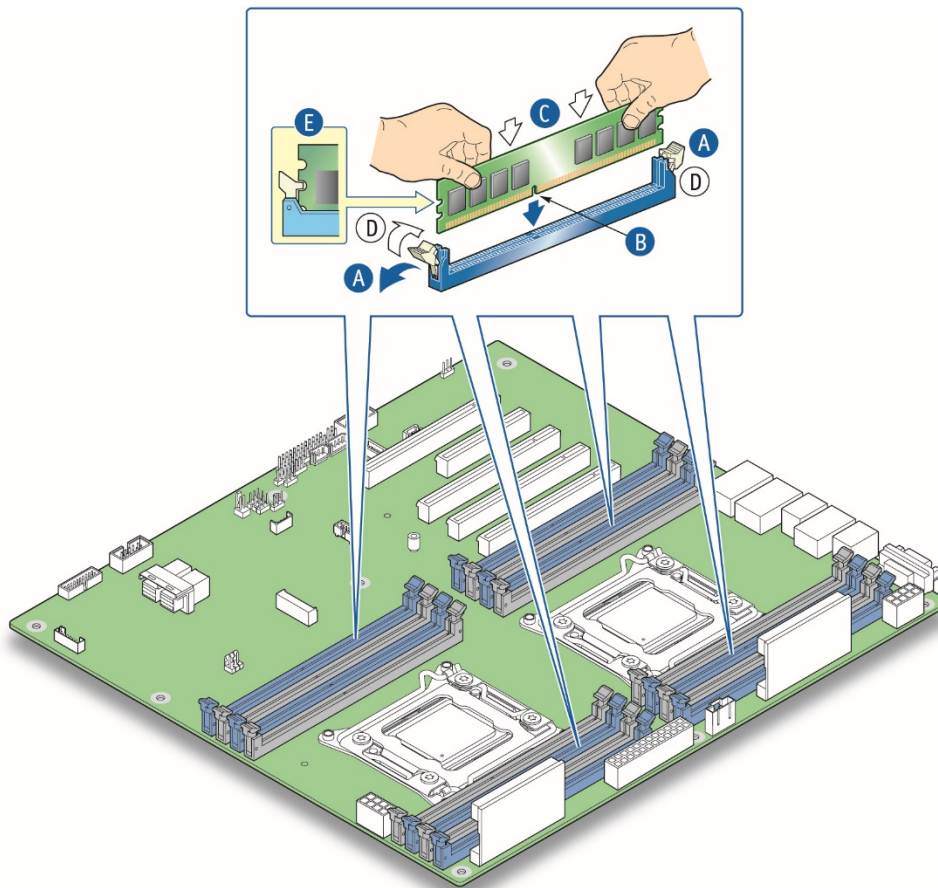


- » Use a ground strap attached to the front panel (with the bezel removed).

To install DIMMs in the S2600CW2SK server board slots, follow these steps:

1. Open the levers on the DIMM slot. Figure 18, (A)
2. Note the location of the alignment notch on the DIMM edge. ("B")
3. Insert the DIMM, making sure the connector edge of the DIMM aligns correctly with the slot. ("E")
4. Using both hands, push down firmly and evenly on both sides of the DIMM until it snaps into place and the levers close. ("C" and "D")  
**IMPORTANT:** Visually check that each latch is fully closed and correctly engaged with the notch on the DIMM edge. ("E")
5. Re-install the processor air duct, the right riser card assembly, and the chassis cover. For instructions, see (RJ), (RK), and (RL) in Chapter 6.
6. If this is the last task you are doing, plug in the power cord(s) and re-connect any peripheral devices.

Figure 18: Memory DIMM Installation



CG00353

### 5.2.3 Replacing or Removing Memory DIMMs

Before you can replace or remove memory DIMMs in the server, you first need to remove the chassis cover, the right-side riser card, and the processor air duct. For instructions, see (A), (B1), and (C) in Chapter 4.

**NOTE:** To reduce the risk of electrostatic discharge (ESD) damage to the processor or the DIMM, be sure to follow these procedures:

- » Touch the metal chassis before touching the DIMM or server board.
- » Keep part of your body (hand, etc.) in contact with the metal chassis to dissipate the static charge while handling the DIMM.
- » Avoid moving around unnecessarily.
- » Use a ground strap attached to the front panel (with the bezel removed).

To remove a DIMM from the S2600CW2SK server board, follow these steps:

1. Open the DIMM slot levers for the DIMM to be removed. (Figure 18, A)
2. Using both hands, hold the DIMM by the edges and lift it up from the slot. Store the DIMM in an anti-static package.
3. If you are installing a replacement DIMM in this slot, return to Step 4 in 5.2.2 “Installing Memory DIMMs”.
4. Re-install the processor air duct, the right riser card, and the chassis cover. For instructions, see (RJ), (RK), and (RL) in Chapter 6.
5. If this is the last task you are performing, plug in the power cord(s) and re-connect any peripheral devices.

## 5.2.4 Adding or Replacing a Processor

**CAUTION:** The processor must be appropriate: Severe damage to the server board may occur if a processor that is inappropriate for the server is installed. Refer to the Configuration Guide located on the support web page <http://kontron.com>. (Rack Mount Systems - CRMS - CG2300 - Ordering Guide).

**NOTE:** Kontron recommends performing a CPU socket inspection before adding or replacing a processor to ensure there is nothing wrong with the fragile socket pins. Follow the instructions in Chapter X, “CPU Socket Inspection”.

Use the instructions provided below to add or replace a processor instead of using the instructions that came with the processor.

Before you can add or replace a processor, you need to remove the chassis cover, the right riser card assembly, and the processor air duct. For instructions, see (A), (B2) and (C) in chapter 4.

Follow the instructions below to remove and then install a processor, referring to Figure 21 through Figure 30.

### Socket and Processor Handling and ESD Precautions

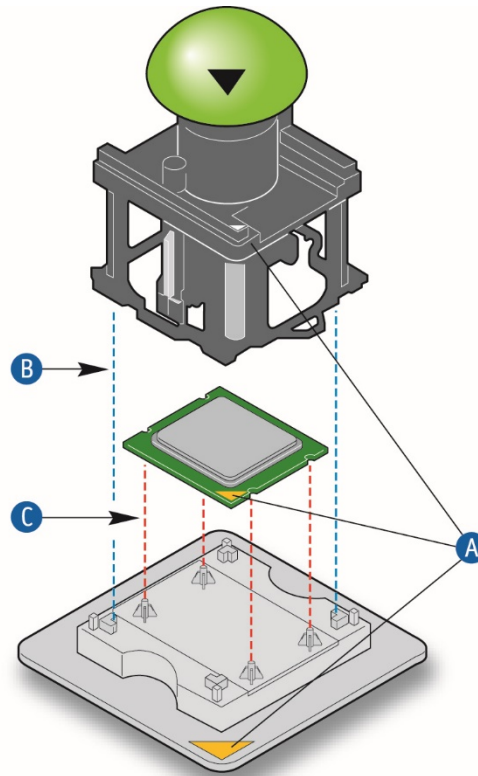
**CAUTION:** Socket contacts are fragile and can be easily damaged if touched. Intel Corporation has developed tools to provide consistent, controlled motions for inserting and removing processors on Intel® server boards. Kontron expects system integrators in high volume integration situations to use the Intel-designed tool at all points in the procedures in this section where a processor is being removed or inserted in a socket.

The tool has two components, as shown in Figure 19:

- » A stage used to hold a processor so that it can be picked up safely by the insertion-removal tool.
- » The insertion-removal tool used to grab a processor safely and move it onto a socket on the baseboard.

This tool is simple to operate. Once it is lined up with the pin 1 indicators on the stage and processor (Figure 19, (A)), pressing down on the large top button until it clicks lifts the processor into the tool. (B) When the tool is positioned over a selected empty socket, pressing down on the button until it clicks safely releases the processor.

Figure 19: Using the Insertion-Removal Tool to Handle Processors

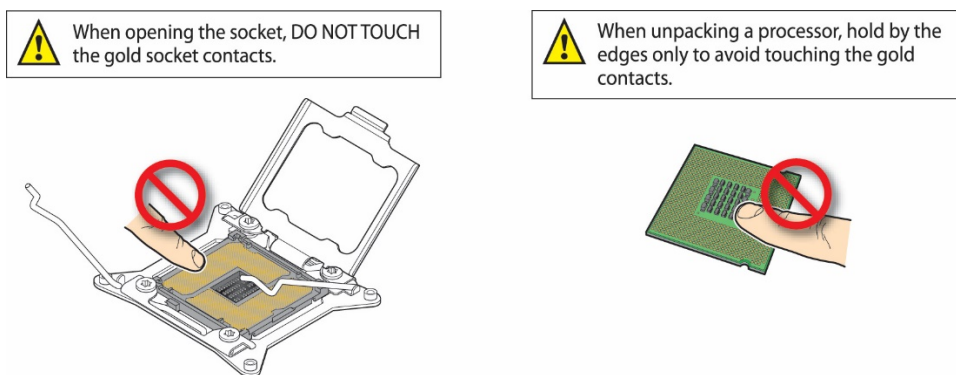


For more information about ordering this tool for use on the LGA 2011 socket, see the Intel support site at <http://www.intel.com/support/motherboards/server/sb/CS-032587.htm>. The tool should be ordered from Chaun Choung Technology Corporation (CCI). See more information at <http://www.ccic.com.tw/lga.php>.

In addition to using the correct tool, also be mindful of the following points when handling the processors and sockets to reduce the risk of electrostatic discharge (ESD) damage to the processor:

- » Touch the metal chassis before touching the processor or server board.
- » Keep part of your body (hand, etc.) in contact with the metal chassis to dissipate the static charge while handling the processor.
- » Avoid moving around unnecessarily.
- » Use a ground strap attached to the front panel (with the bezel removed.)

Figure 20: Cautions for Handling Processors



CG00074

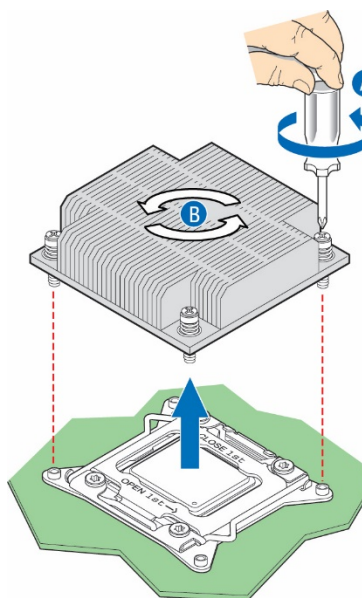
## Removing a Heat Sink

This procedure is only necessary if there is a heat sink covering the socket at the site where you want to add/replace a processor.

1. Loosen the four captive screws on the corners of the heat sink with a #2 Phillips screwdriver. (Figure 21, "A")
2. Twist the heat sink slightly to break the seal between the heat sink and the processor socket. ("B")
3. Lift the heat sink from the socket. If it does not pull up easily, twist the heat sink again.

**NOTE:** Do not force the heat sink. Doing so could damage the processor or the socket contacts.

Figure 21: Removing the Heat Sink



CG00075

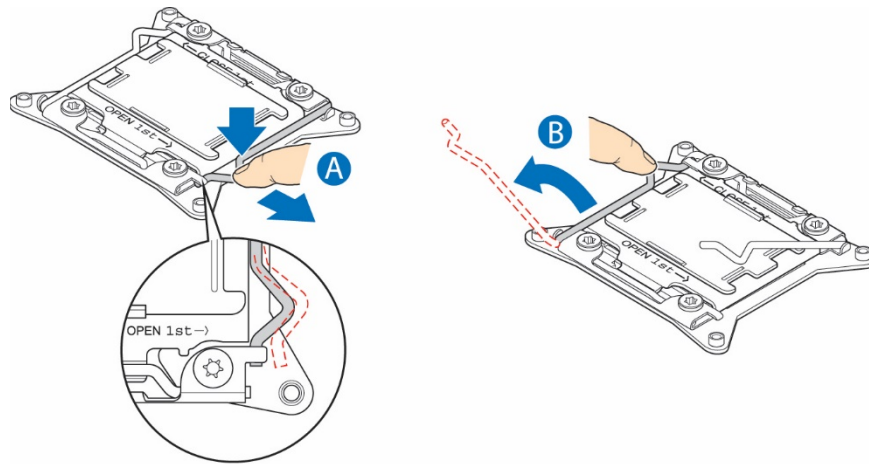
## Removing a Processor

The procedures that follow cover the steps for removing an old processor out of its socket on the server board.

### Opening the Socket

1. Open the socket by pushing the lever handles down and away from the socket to release the load plate. (Figure 22, (“A” and “B”))

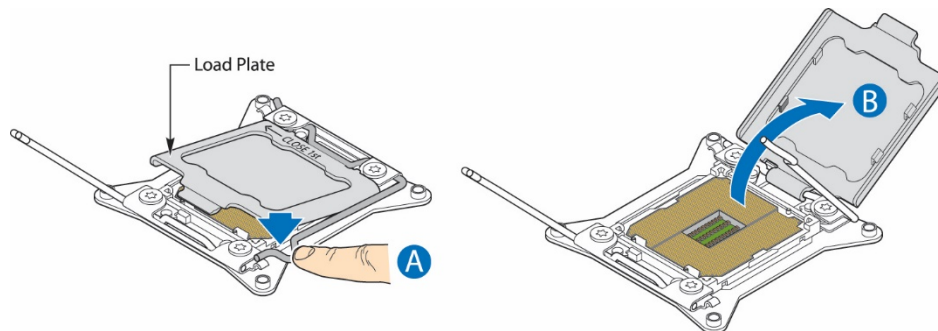
Figure 22: Using the Socket Levers



CG00076

2. Unlock the hinge lever first to a 35° angle only and then the action lever (Figure 23, (A)). The action lever will also raise the hinge lever so that the load page is upright. Then lift up the load plate.

Figure 23: Opening the Load Plate



CG00077

### Removing the Processor

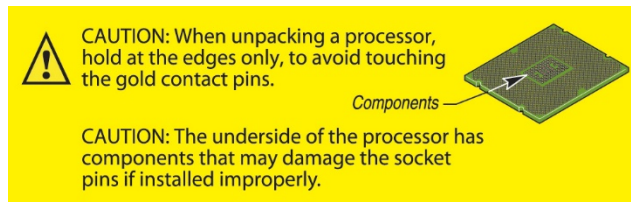
1. Use the Intel tool to remove the processor from the socket or gently remove the processor manually.

### Installing a New Processor

**NOTE:** Follow the ESD precautions covered in Appendix A: Safety Information”.

1. Take the processor out of its packaging and remove the protective shipping cover by grasping the cover tab and pulling it away from processor load plate. Store the protective cover for future use. (Figure 24)

Figure 24: Removing the Shipping Cover



CG00078

**CAUTION:** The underside of the processor has components that may damage the socket pins if installed improperly. The processor must align correctly with the socket opening before installation.

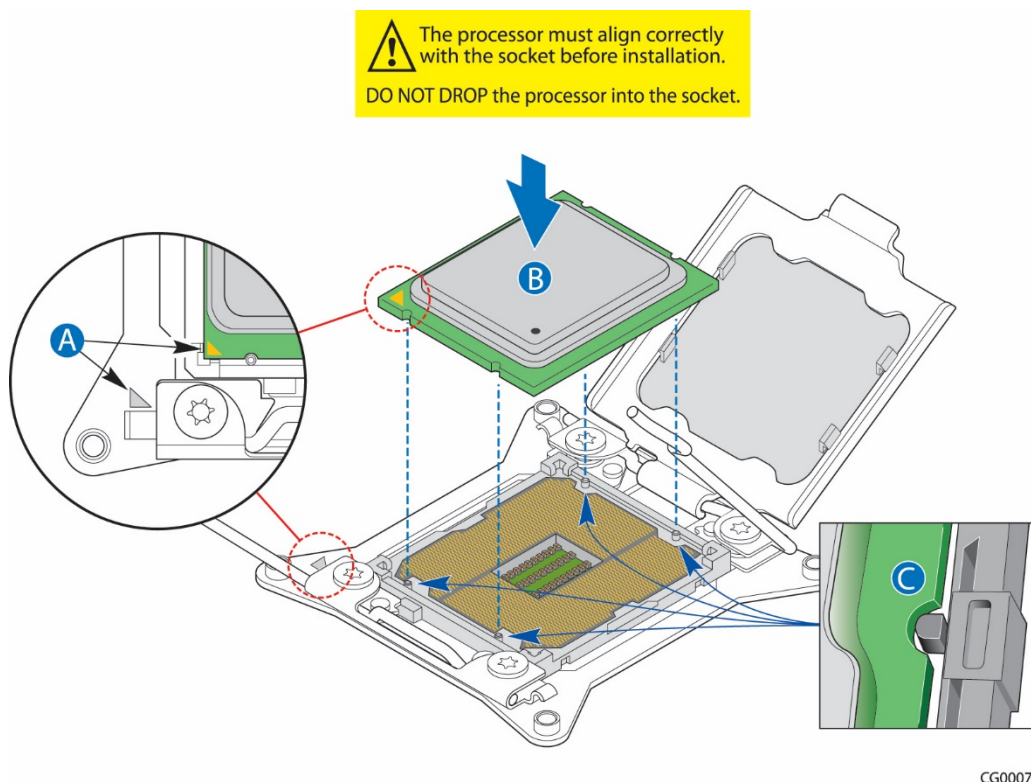
2. Use the Intel stage tool and insertion-removal tool to move the processor to the socket on the server board.
3. Line up the insertion/removal tool with the pin 1 indicators on the socket and make sure the tool is properly seated at all four corners.
4. Press straight down using the tool button. A click indicates that the processor is loaded into the socket.

Or if not using the tools:

1. Orient the processor with the socket so that the processor cutouts match the socket notches. (Figure 25, "A")
2. Gently place the processor in the socket. ("B")

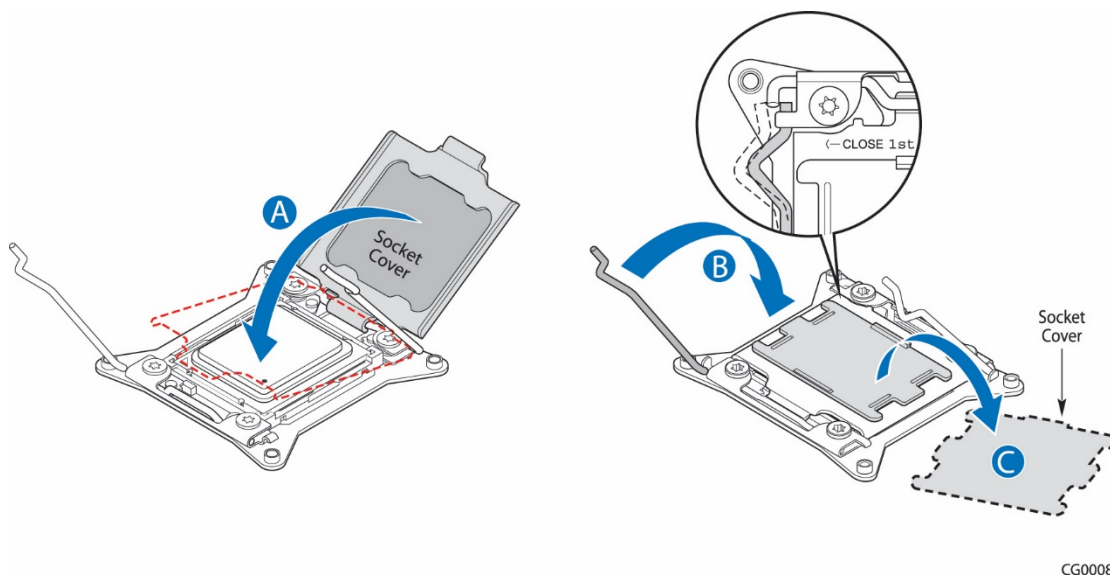


Figure 25: Manually Installing the Processor in the Socket



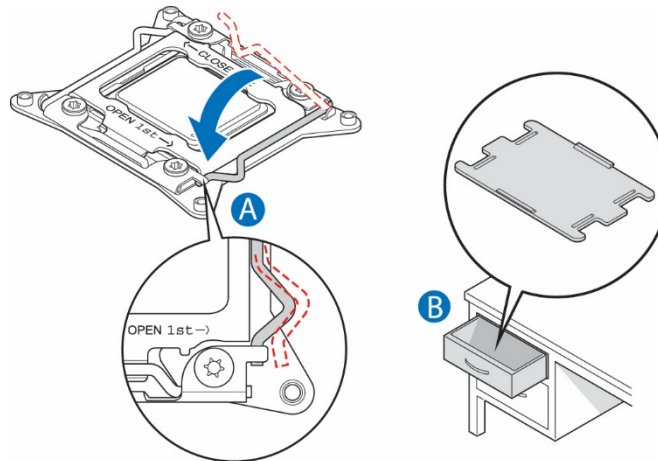
3. Carefully close the load plate.
4. Close the hinge socket lever and ensure that the load plate tab engages under the socket lever when fully closed. (Figure 26 "B")

Figure 26: Closing the Processor Load Plate



5. When the load plate comes down and the lever is latched, the socket cover pops off. Save it for future use if the processor is removed from the socket or for protection if the server is moved or shipped. (Figure 27 "A" and "B")

Figure 27: Closing the Last Socket Lever



CG00081

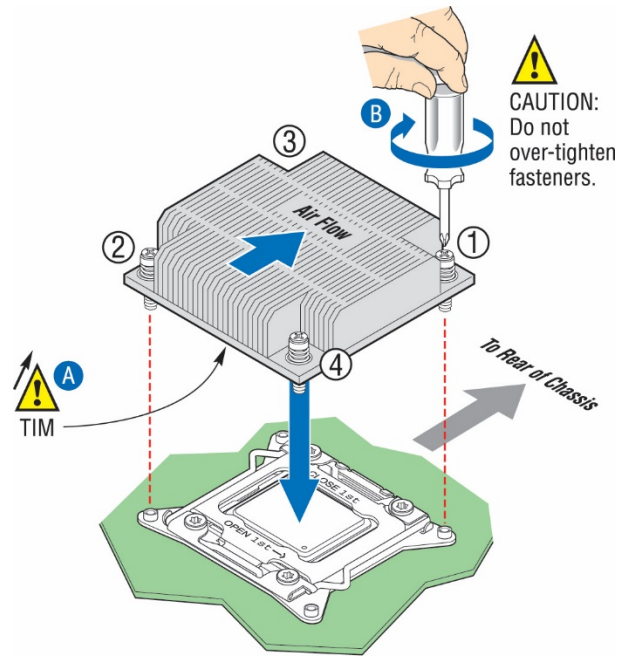
### 5.2.5 Installing a Heat Sink

1. If this is a new heat sink (not one removed to add/replace a processor), remove the protective film, if present, on the Thermal Interface Material (TIM) located on the bottom of the heat sink. (Figure 28, "A")
2. Set the heat sink over the processor, lining up the four captive screws with the four socket posts surrounding the processor. Align the heat sink fins to the front and back of the chassis for correct airflow (front to back). (See Figure 28)
3. Loosely screw in the captive screws on the heat sink corners by tightening one, then the one diagonally opposite, and so on. ("B")
4. Gradually and equally tighten each captive screw in diagonal order until each one is firmly tightened. See Figure 28 for the order.

**CAUTION:** the torque spec for these screws is 8 inch pounds. Be careful not to exceed it.



Figure 28: Installing a Heat Sink



CG00075A

## 5.2.6 Configuring Jumpers on the Server Board

The jumpers are located on the S2600CW2SK server board.

Before you can work with the jumpers defined in this section, you must first remove the chassis cover, right riser card assembly and processor air duct. For instructions, see (A), (B2) and (C) in Chapter 4.

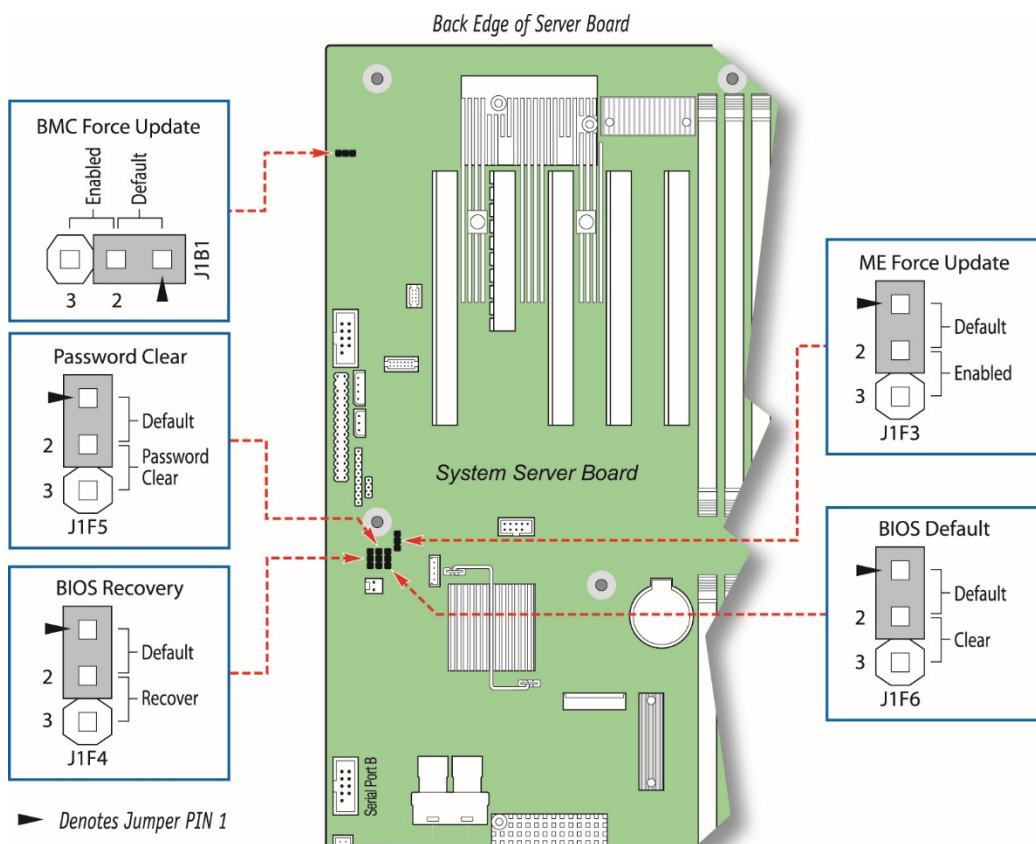
The other components on the server board can remain in place.

The server board has several 3-pin jumper blocks that can be used to configure, protect, or recover specific features of the server board. This section shows the jumper blocks available and what they do. For detailed information about using these jumpers, see Sections 7.4 through 7.8.

Pin 1 on each jumper block is identified by this symbol on the silkscreen: ▼

Figure 29 shows the jumper blocks.

Figure 29: Jumper Blocks (J1B1, J1F3, J1F5, J1F4, J1F6)



CG00373

Table 2: Server Board Jumpers (J1F5, J1B1, J1F3, J1F4, J1F6)

Jumper Name	Pins	System Results
J1F5: Password Clear	1 - 2	These pins should have a jumper in place for normal system operation ( <b>Default</b> )
	2 - 3	To clear administrator and user passwords, power on the system with pins 2 - 3 connected. The administrator and user passwords clear in 5 - 10 seconds after power on. Pins 2 - 3 should not be connected for normal system operation.
J1B1: BMC Force Update	1 - 2	BMC Firmware Force Update Mode - Disabled ( <b>Default</b> )
	2 - 3	BMC Firmware Force Update Mode - Enabled
J1F3: ME Force Update	1 - 2	ME Firmware Force Update Mode - Disabled ( <b>Default</b> )
	2 - 3	ME Firmware Force Update Mode - Enabled
J1F4: BIOS Recovery	1 - 2	These pins should have a jumper in place for normal system operation ( <b>Default</b> )
	2 - 3	The main system BIOS does not boot with pins 2 - 3 connected. The system only boots from EFI-bootable recovery media with the recovery BIOS image.
J1F6: BIOS Default (CMOS Clear)	1 - 2	These pins should have a jumper in place for normal system operation ( <b>Default</b> )
	2 - 3	If these pins are connected when AC power is unplugged, the CMOS settings are cleared within five seconds. Pins 2 - 3 should not be connected for normal operation.

See Section 9.1, “BIOS Defaults (CMOS Clear) and Password Reset Usage Procedure” in the *Intel® Server Board S2600CW2SK Family TPS* on the Kontron Support website for more information about the recovery features.

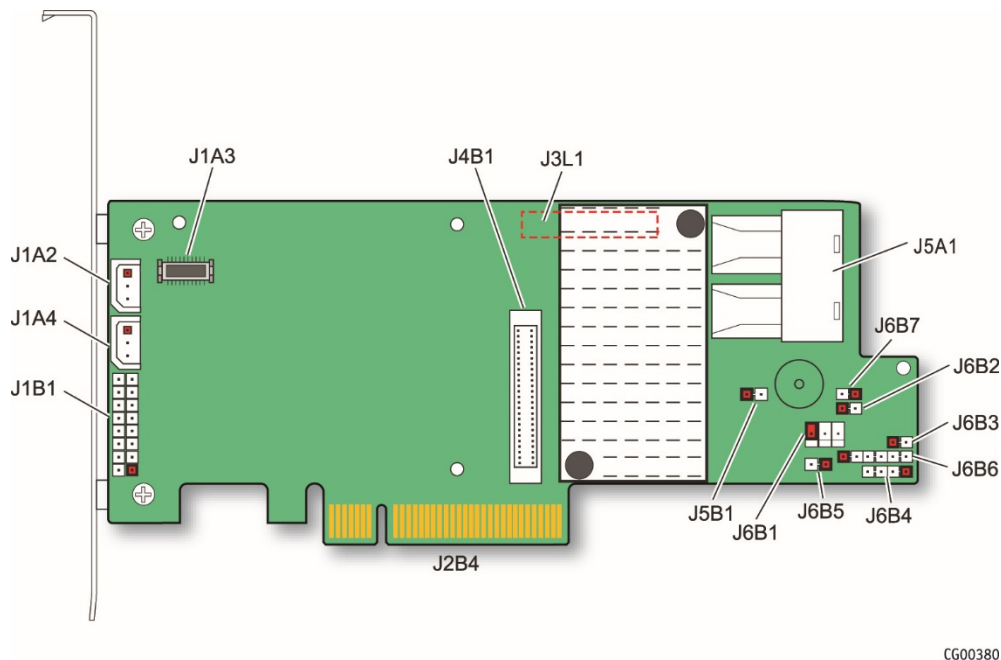
## 5.2.7 Installing a Hardware RAID Controller

Hard disk drives are supported with SAS software RAID 0/1/10 on the CG2300 server by default. Hardware RAID support requires a separately-orderable SAS hardware RAID controller, which is described in this section.

**NOTE:** The components used as examples in this section are from the Intel® RS3DC080 hardware.

Figure 30 shows the SAS hardware RAID controller board layout. The board's gold edge connector attaches to a header on the baseboard as shown in Figure 31.

Figure 30: Hardware RAID Adapter Layout



CG00380

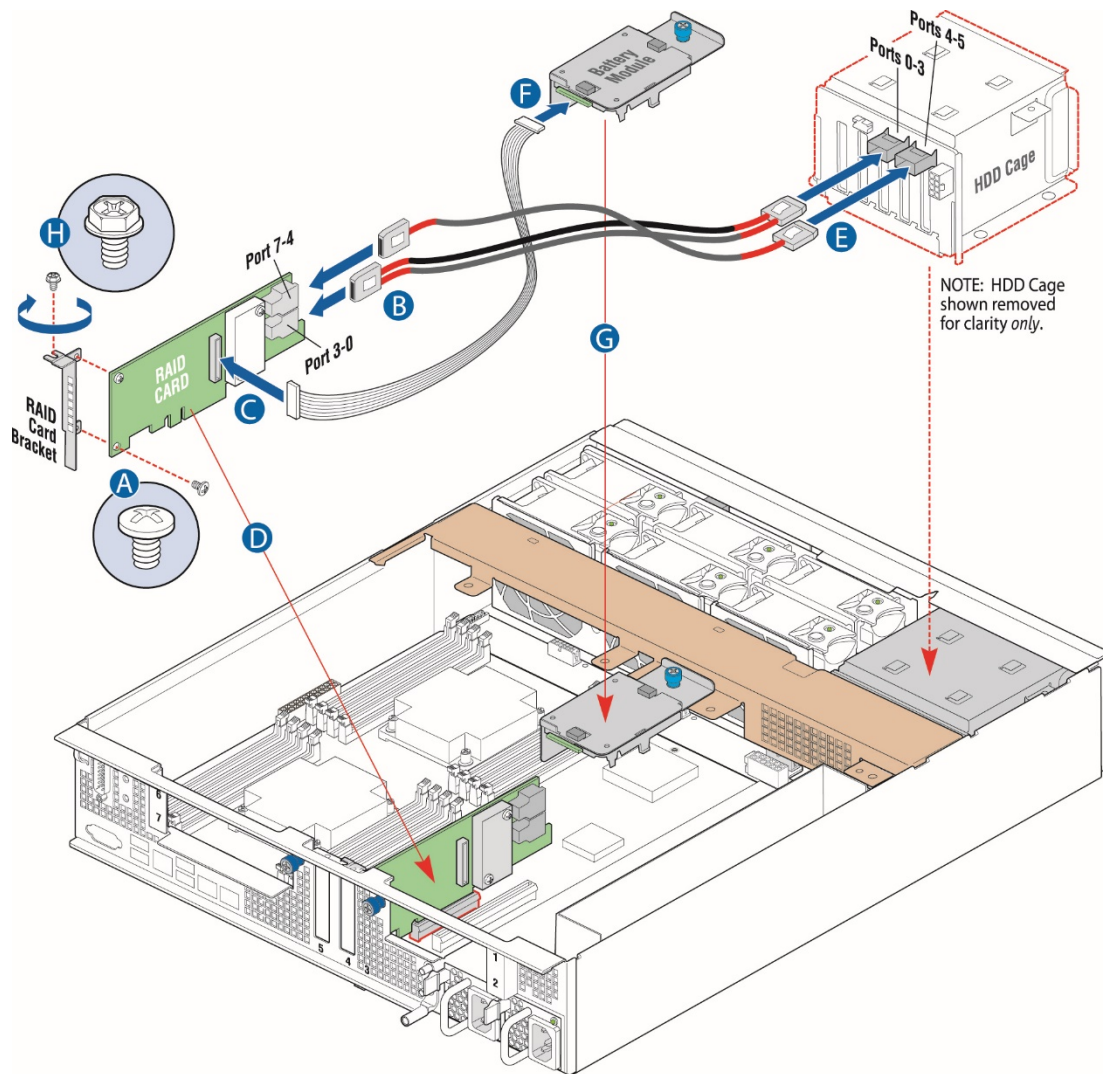
Before you can install the hardware RAID controller board, you must first remove the chassis cover and the left riser card assembly. For instructions, see (A) and (B1) in Chapter 4.

Then, disconnect the two SAS cables (SFF-8643 ends) from the baseboard connector (SGPI01) where they are used for default software RAID. For instructions, see (E4) in Chapter 4.

To install the hardware RAID controller board, follow these steps:

1. Remove the bracket from the chassis rear panel.
2. Fasten the bracket from the chassis to the RAID controller board, using the two screws in the kit. (Figure 31, "A")
3. Connect the SAS 1 cable end labeled SFF-8643 into the proper connector (right) on the RAID controller board. ("B")
4. Connect the SAS 2 cable end labeled SFF-8643 into the proper connector (left). ("B")
5. Insert the hardware RAID controller board in the PCIe slot 3 on the baseboard and press down to mate it with the header. ("D")
6. Re-install the riser card assembly and the chassis cover. For instructions, see (RK) and (RL) in Chapter 6.
7. If this is the last task you are performing, plug in the power cord(s) and re-connect any peripheral devices.

Figure 31: Installing the RAID Controller Board



CG00375

### 5.2.8 Installing the SuperCap Battery Backup Module

This module is a flash-based battery backup module for SAS drives. It comes as a part of the Intel RS3DC080 RAID controller kit and may not be compatible with other RAID products. The mounting bracket for the module is a separately orderable part (Intel AXXRMFBU4). For more information about the battery backup module, see the *CG2300 Carrier Grade Server Configuration Guide* located on the Kontron support website at <http://kontron.com>. (Rack Mount Systems - CRMS - CG2300 - Ordering Guide.)

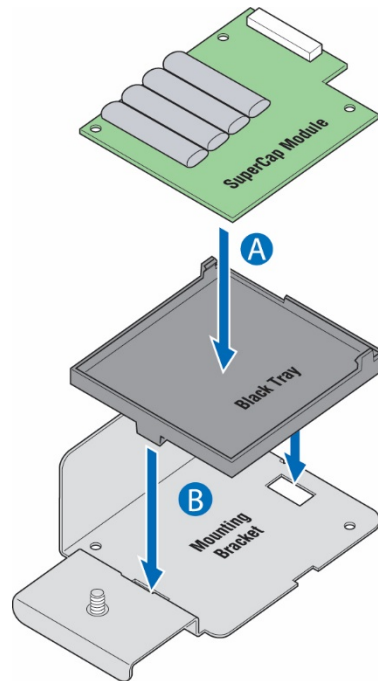
Before you can install the battery backup module, you need to remove the chassis cover and left riser card assembly. (That is, if they haven't already been removed for installing the hardware RAID controller board). For instructions, see (A) and (B1) in Chapter 4.

To install the battery backup module:

1. Insert the module into the black plastic tray. (Figure 32, "A")

2. Fasten the module and tray assembly to the sheet metal bracket by inserting the tabs into the cut-outs on the bracket. (“B”)
3. Holding the locking lever on the plastic tray out, slide the module/tray assembly towards the back of the bracket until it locks into place.

Figure 32: Setting Up the Battery Backup Assembly



CG00102

4. Connect the signal/power pigtail cable to the proper connector on the hardware RAID controller board (“C”) and the rear of the battery backup assembly. (Figure 31, “F”)
5. Place the battery backup bracket on the support cross bar, lining it up with the center hole on the middle shelf. (“G”)
6. Use the blue retention screw to fasten the battery backup assembly bracket to the cross bar.
7. Re-install the left-side riser card assembly and the chassis cover. For instructions, see (RK) and (RL) in Chapter 6.
8. If this is the last task you are performing, plug in the power cord(s) and re-attach any peripheral devices.

### 5.2.9 Installing a PCIe Riser Card

The CG2300 server does not ship with any PCI riser cards, just the sheet metal brackets where the riser cards and PCI add-in cards are housed. The S2600CW2SK server board has two riser slots capable of supporting riser cards on the right side and left side of the chassis. Baseboard PCIe slot 2 (left side) and PCIe slot 6 (right side) support the riser cards in the CG2300 system. Baseboard PCIe slot 2 supports a single slot PCIe X16 riser or a dual slot PCIe X8 riser. These risers are referred to as the ‘left’ risers since the boards plug in on the left side of the chassis as viewed from the front of the server. PCIe riser cards in slot 2 connect to CPU2. Baseboard PCIe slot 6 supports a single slot PCIe X16 riser or a dual slot PCIe X8 riser. These risers are referred to as the ‘right’ risers since the boards plug in on the right side of the chassis. PCIe riser cards in slot 2 connect to CPU1.

Table 3 identifies the card configurations and the connector types used.

Once PCIe add-in cards are installed and the riser card assembly is remounted in the chassis, the cards are accessible from the rear of the server chassis.

Table 3 identifies the card configurations and the connector types used.

**Table 3 Riser Card Configurations**

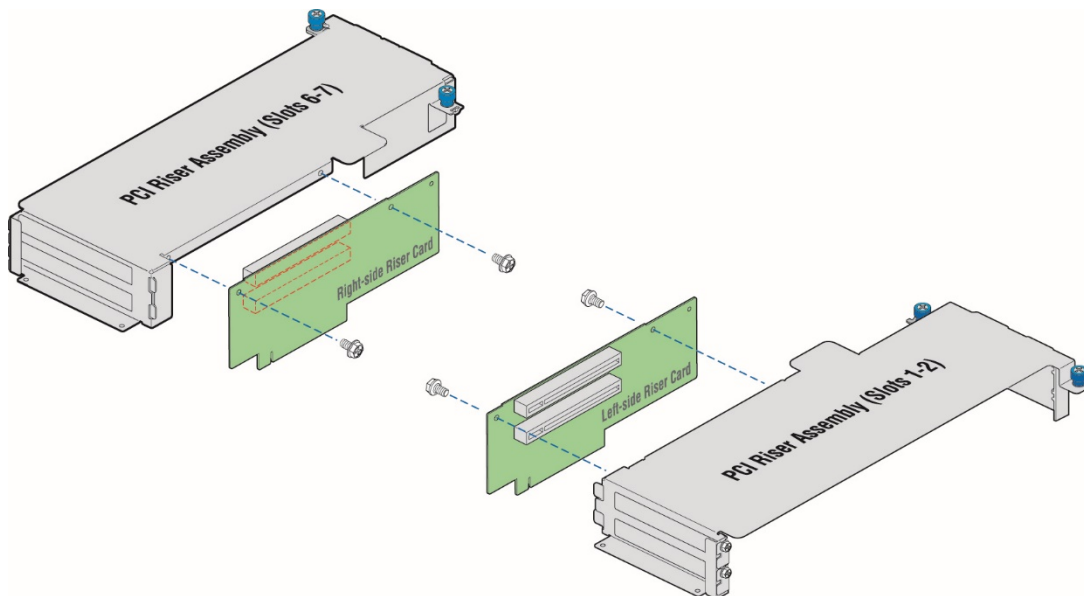
Riser Card Option	Slot Configuration
PCI Express passive riser, single slot x16 Right side riser (baseboard slot 6)	Single full-height PCI Express x16 connector
PCI Express passive riser, dual slot x8 Right side riser (baseboard slot 6)	Two full-height PCI Express x8 connectors
PCI Express passive riser, single slot x16 Left side riser (baseboard slot 2)	Single full-height PCI Express x16 connector
PCI Express passive riser, dual slot x8 Left side riser (baseboard slot 2)	Two full-height PCI Express x8 connectors

**NOTE:** All riser options run at PCIe Gen3 speeds.

Before you can install a riser card, you must first remove the chassis cover and the riser card assembly from the chassis. For instructions, see (A) and (B) in Chapter 4.

Figure 33 shows how a riser card is installed into the metal bracket.

**Figure 33: Adding Riser Cards**



CG00210

**CAUTION:** Before removing or replacing any of the boards on the CG2300 server, you must first take the server out of service, turn off all peripheral devices connected to the server, turn off the server by pressing the power button, and unplug the power cord(s) from the system and wall outlet.

When handling the riser card, observe normal safety and ESD precautions. (See Appendix A: Safety Information” for more information.

To install the riser card in the sheet metal bracket:

1. Fasten the riser card to the bracket with the two 6/32 screws as shown in Figure 33.  
Torque screws to 8 lb\*in.

At this point the riser card is ready for installing add-in cards.

### 5.2.10 Installing PCIe Add-in Cards

The right-side and left-side riser card options support the same PCIe add-in card options. See Table 3 for the possible configurations. The figures in this section use the left-side slot 2 riser card assembly, a PCI Express passive riser, dual slot x8 and single x16 add-in card options as the example.

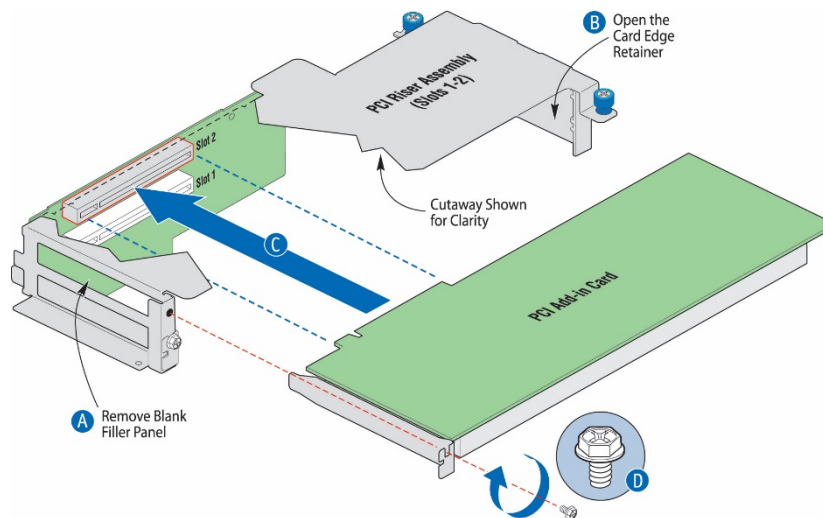
Before you can install an add-in card, you must first remove the chassis cover and remove the riser card assembly from the chassis. For instructions, see (A) and (B) in Chapter 4.

**CAUTION:** When handling a PCI add-in card, observe the normal safety and ESD precautions. See Appendix A: Safety Information for more information.

1. Turn the riser card assembly upside down so it is resting on the top of the sheet metal cage.
2. If you are replacing a PCIe add-in card in a slot, remove the rear retention screw that fastens the add-in card to the riser card. (Figure 34 “D”)  
For a full-length card, also open the card edge retainer in the front of the assembly by loosening the blue captive screw (“B”)
3. Remove the card from the riser card socket.
4. If you are adding a PCIe card, not replacing one, in the selected slot, remove the blank filler panel from the rear bracket of the riser card assembly. (Figure 34, “A”)
5. For a full-length add-in card, open the card edge retainer by loosening the blue captive screw. (“B”)
6. Attach the add-in card to the appropriate riser card connector. (“C”)  
Be sure that the add-in card edge connector is seated in the riser card connector correctly.
7. Fasten the add-in card to the riser card assembly bracket using the rear retention screw. (“D”)  
For full-length cards, also secure the card in the grooves at the slot level on the retainer bracket and tighten the blue captive thumb screw. (“D”)



Figure 34: Installing a PCIe Add-In Card in the Riser Card Assembly

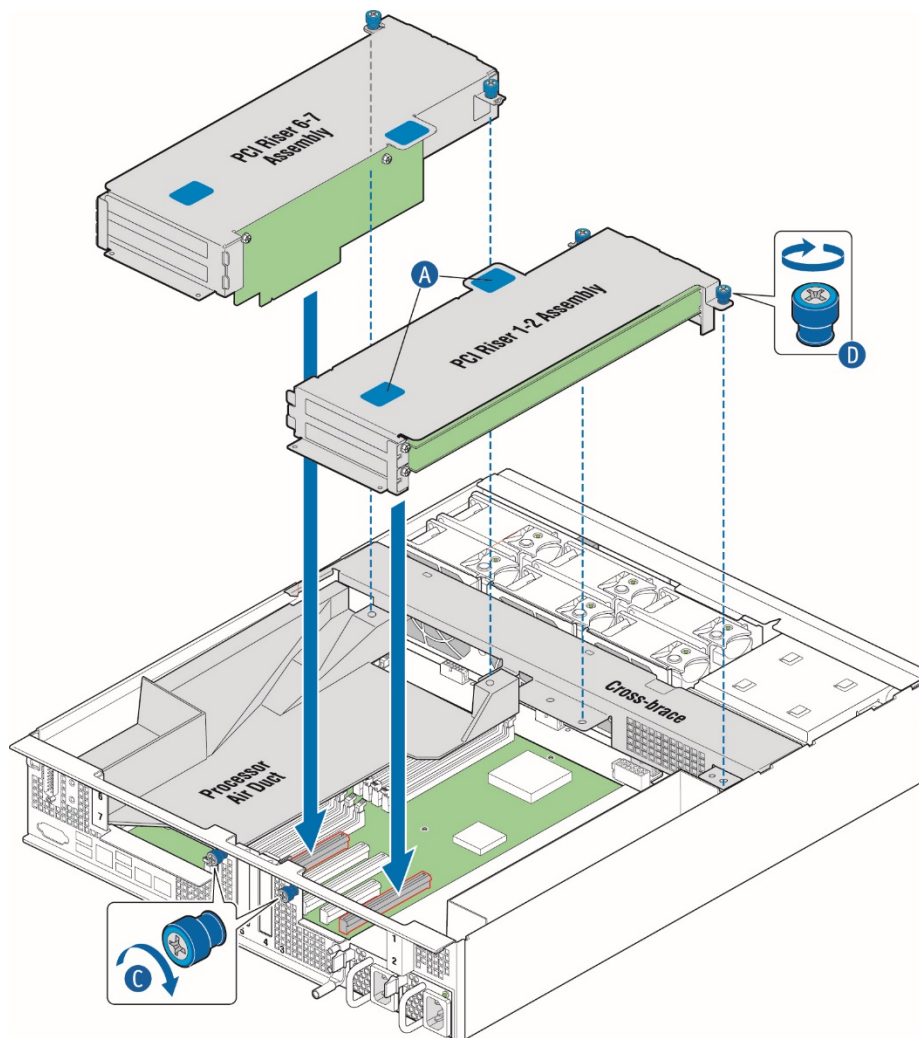


CG00088

8. Using the two blue touch points, install the riser card assembly into its slot (slot 2 or slot 6) on the baseboard. (Figure 35, "A")
9. Secure the riser card assembly by tightening the captive screws ("C" and "D").



Figure 35: Installing and Securing the Riser Card Assembly



CG00356

10. Re-install the riser card assembly and the chassis cover. For instructions, see (RK) and (RL) in Chapter 6.
11. If this is the last task you are performing, plug in the power cord(s) and re-attach any peripheral devices.

### 5.2.11 Installing the RMM4 Lite Key

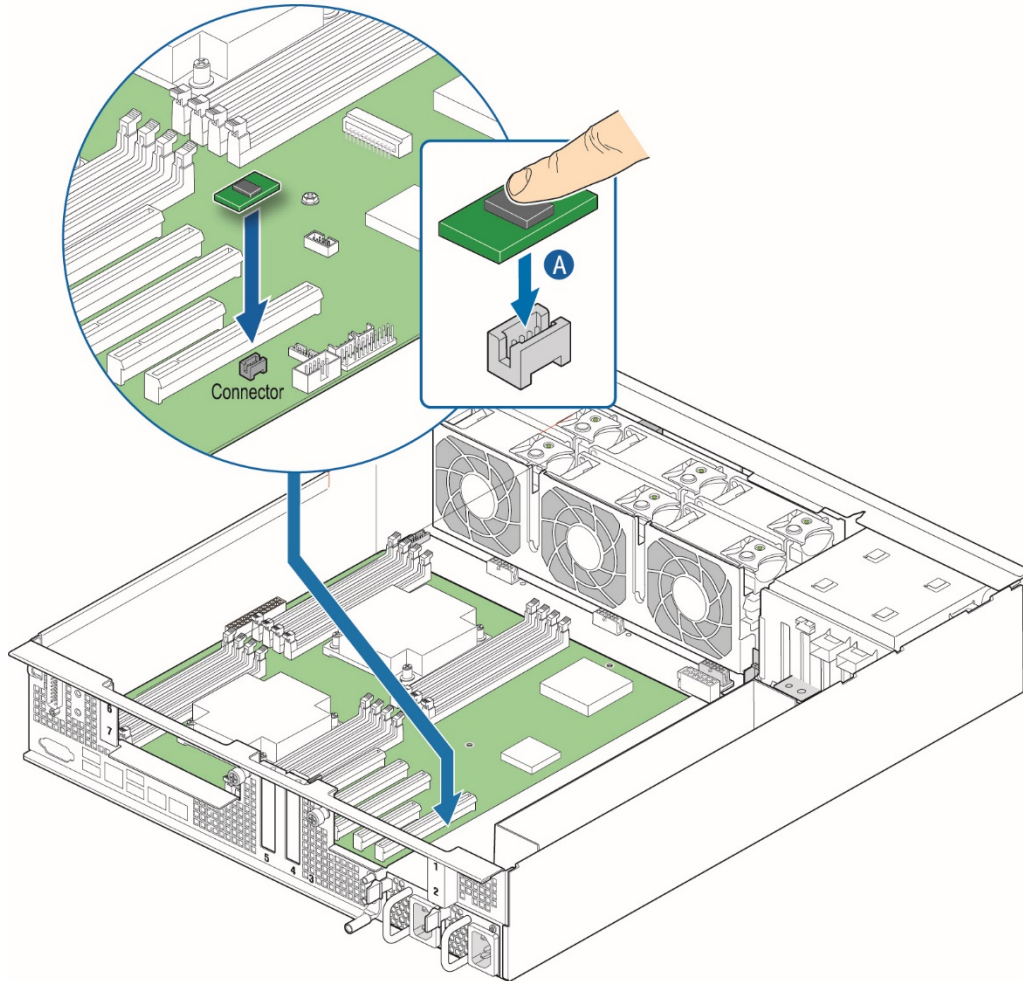
The Remote Management Module (RMM) solution for the CG2300 server uses RMM4 in the iBMC on the S2600CW2SK server board.

Before you can install the RMM4Lite key, you must first remove the chassis cover and the left riser card assembly. For instructions, see (A) and (B1) in Chapter 4.

To install the RMM4 lite key:

1. Press the key into the socket on the baseboard. (Figure 36, "A")

Figure 36: Installing the RMM4 Key



CG00378

2. Re-install the left-side riser card assembly and the chassis cover. For instructions, see (RK) and (RL) in Chapter 6
3. If this is the last task you are performing plug in the power cord(s) and re-attach any peripheral devices

### 5.2.12 Installing an M.2 Storage Drive

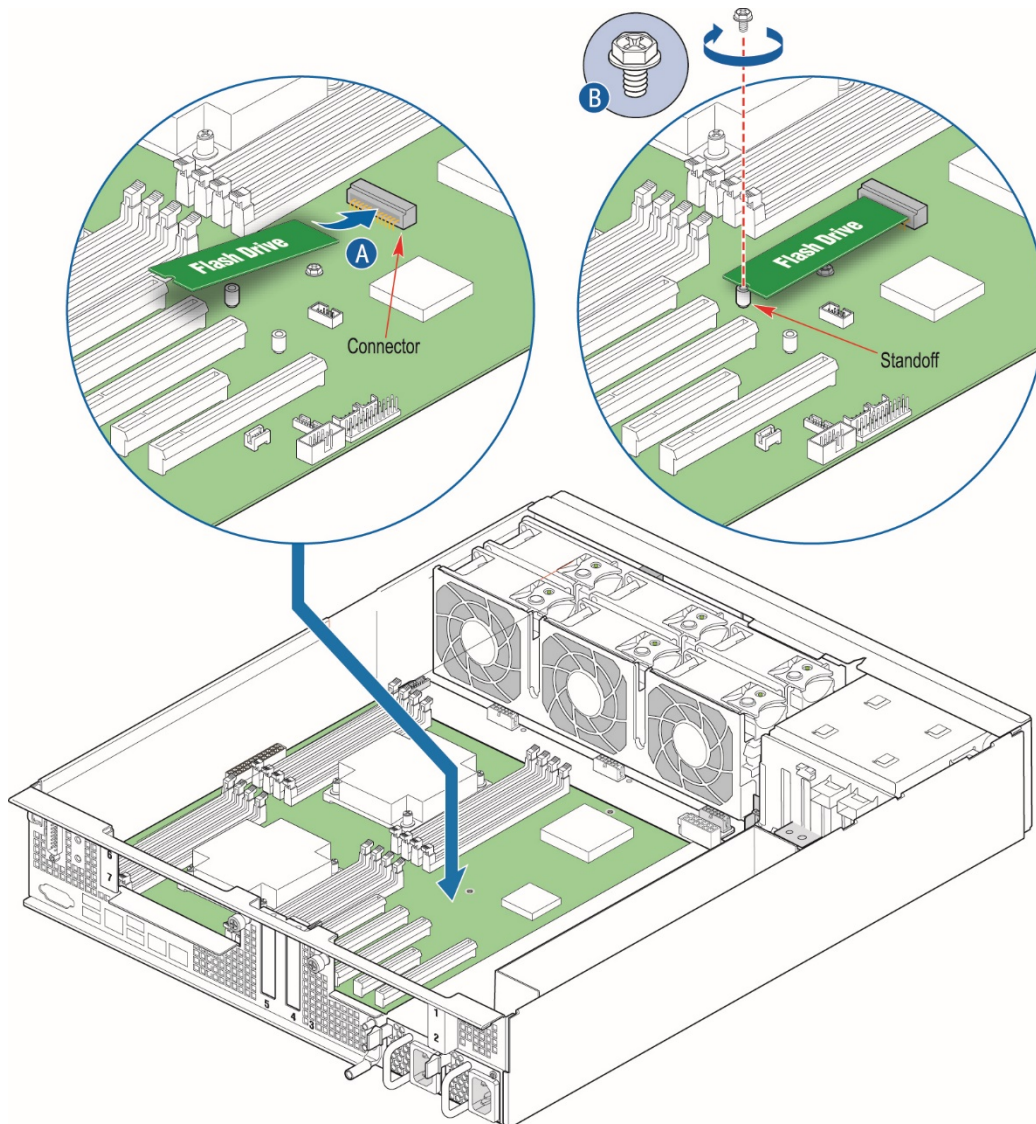
A separately purchased, optional M.2 flash drive provides SATA storage. The M.2 flash drive is installed on the S2600CW2SK server board.

Before you can install an M.2 flash drive, you must first remove the chassis cover and the left riser card assembly. For instructions, see (A) and (B1) in Chapter 4.

To install the M.2 flash drive card:

1. Connect the M.2 card to the header on the baseboard near the CMOS battery. (Figure 37, "A")
2. Seat the other end of the M.2 card around the post on the baseboard.
3. Secure the M.2 card by fastening the screw in the post. ("B")

Figure 37: Installing an M.2 Flash Drive on the Server Board



CG00376

4. Re-install the left-side riser card assembly and the chassis cover. For instructions, see (RK) and (RL) in Chapter 6.
5. If this is the last task you are performing, plug in the power cord(s) and re-attach any peripheral devices.

### 5.2.13 Installing an eUSB Module

A separately purchased, optional Embedded USB flash drive (eUSB) provides local USB flash memory storage for various uses, such as system information, diagnostic partitions, and configuration data. The eUSB is installed on the S2600CW2SK server board in front of PCIe slot 3.

Before you can install an eUSB module, you must first remove the chassis cover, the left riser card assembly, and the hardware RAID backup battery assembly. For instructions, see (A), (B1), and (F) in Chapter 4.

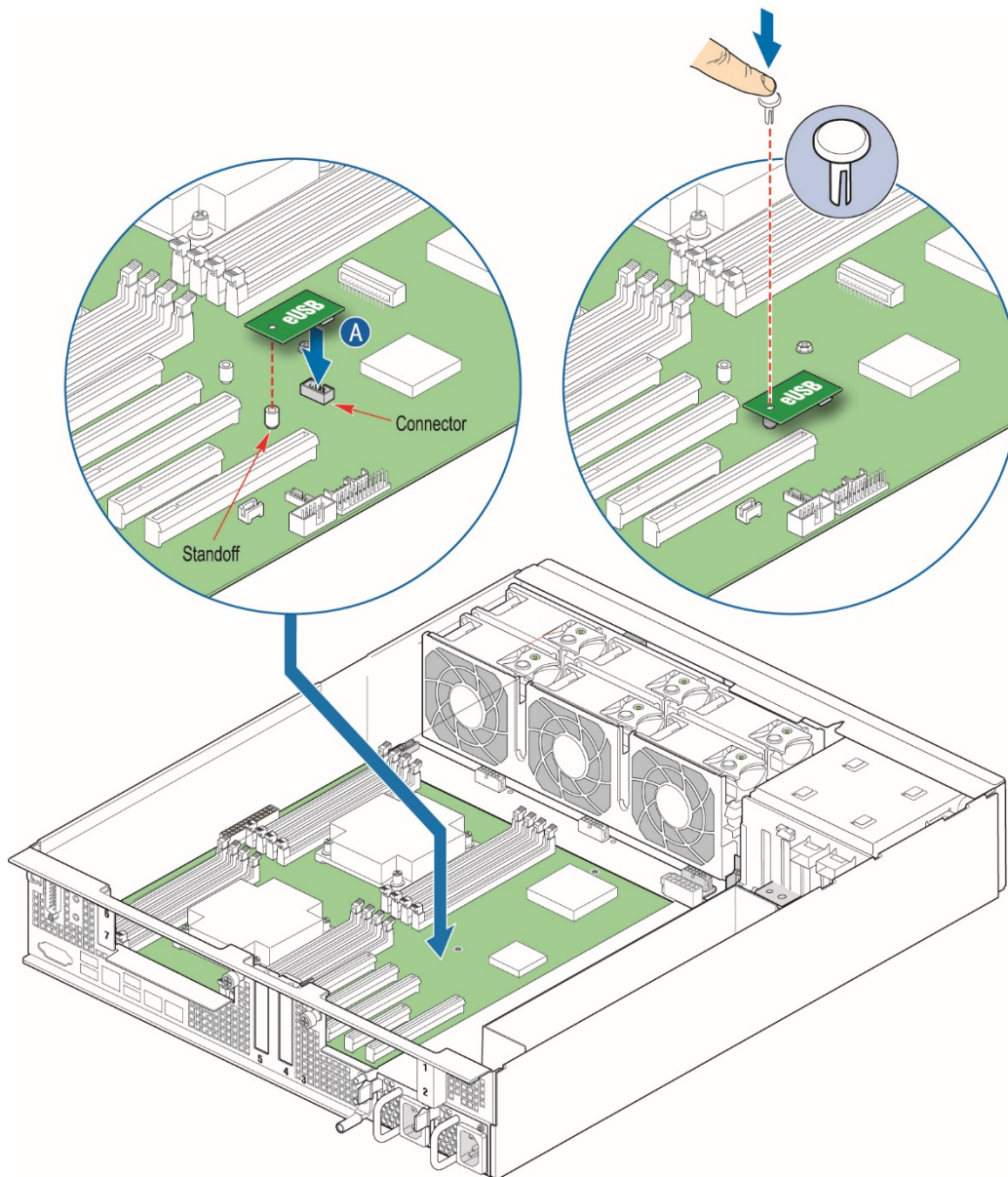
To install the eUSB module:

1. Locate the standoff and connector on the baseboard. (Figure 38)



2. Install the eUSB module onto the server board by plugging the 2x5 header on the eUSB module onto the server board USB header ("A").
3. Press down on the eUSB module, using one finger on each side of the module's mounting hole, to snap the eUSB module securely in place. You will know if the module is not properly seated (snapped in place) if the module is angled instead of flat and parallel with the baseboard.
4. Fasten the eUSB module using the white plastic standoff on the baseboard. See Figure 38.

**Figure 38: Installing an eUSB Flash Module on the Server Board**



CG00377

5. Re-install the left riser card assembly, the battery backup assembly, and the chassis cover. For instructions, see (RK), (RI), and (RL) in Chapter 6.
6. If this is the last task you are performing, plug in the power cord(s) and re-attach any peripheral devices.

### 5.2.14 Replacing the Front Panel Board

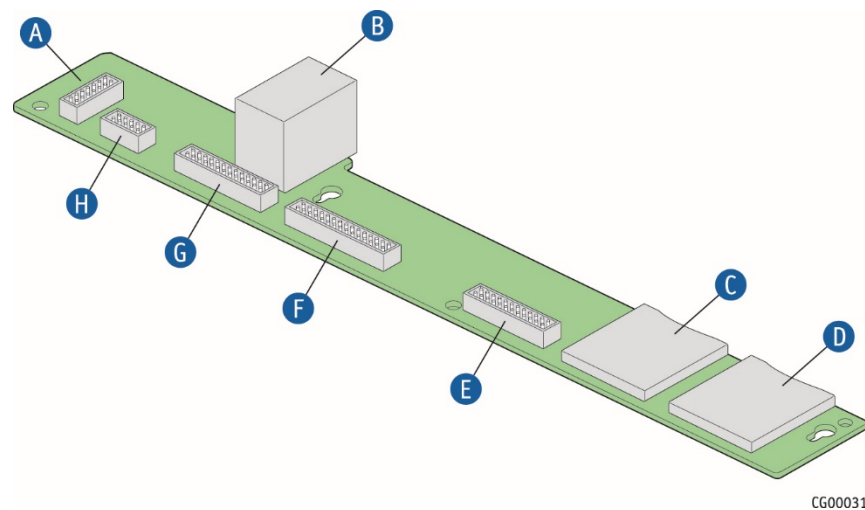
The front panel board provides the interface to the controls at the front of the server, the power interconnect for the server board, the USB and COM2 interfaces and SD flash modules. The FP board also houses the LED/switch board that controls the front panel LEDs and the telco alarm manager.

To replace the FP board, you must first remove the chassis cover, the support cross bar and all three components attached to it, all five cables in the cable bundle bracket, the fan cage and bundle bracket, all five cables connected to the FP board.

For instructions, see (A), (D), (E1), and (G) in Chapter 4.

Figure 39 shows the location of all the connectors on the FP board.

Figure 39: Front Panel Board Connectors



Item	Description	Item	Description
A	TAM signal cable connector (J3)	E	SSI front panel power cable connector (J1)
B	USB/RJ45 serial stacked header	F	LED/switch board power/signal cable connector (J2)
C	SD 0 flash module	G	Multifunction power/signal cable connector (J1A1)
D	SD 1 flash module	H	Front panel board USB cable connector (J4)

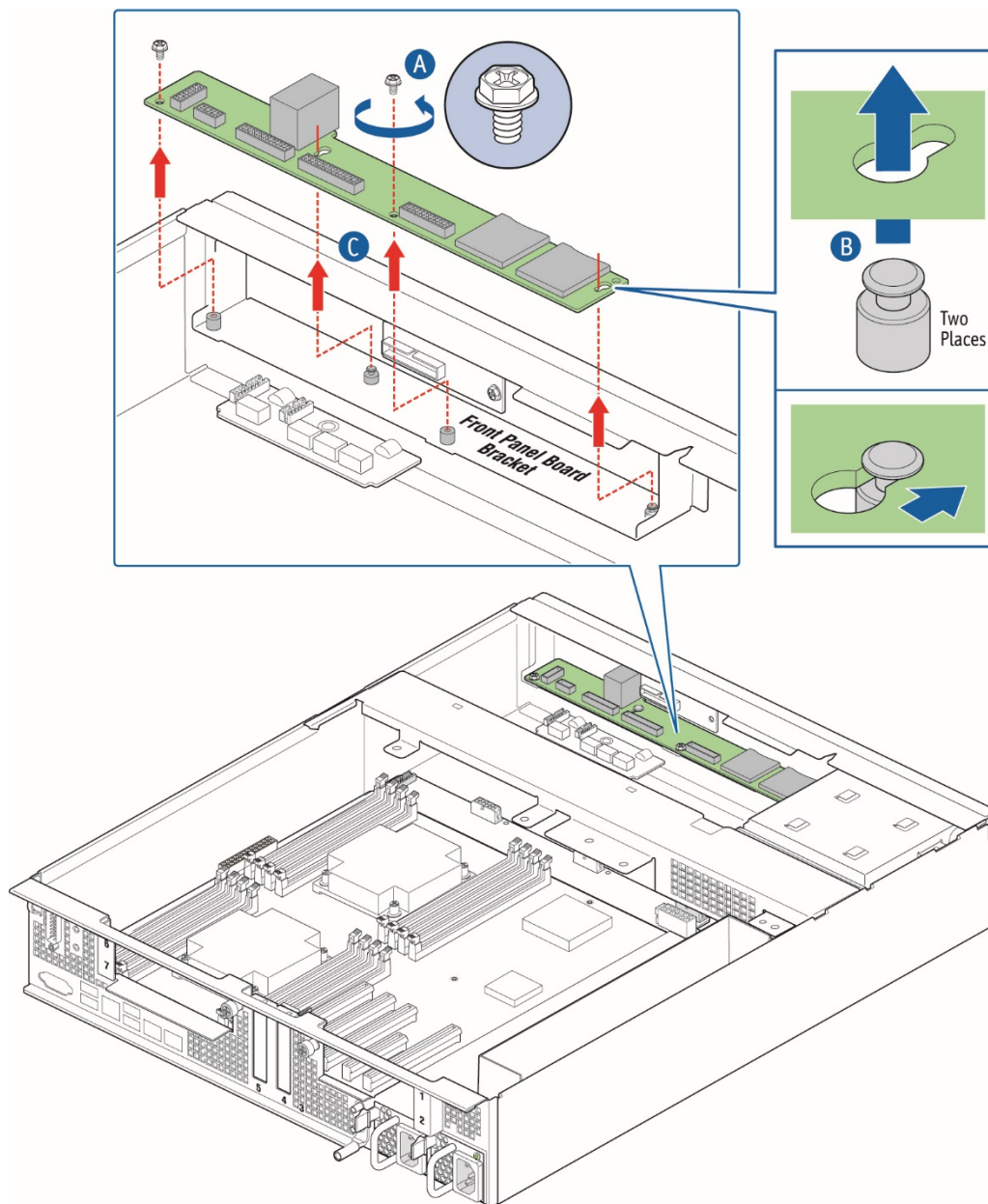
**CAUTION:** Before replacing any of the boards on the CG2300 server, you must first take the server out of service, turn off all peripheral devices connected to the server, turn off the server by pressing the power button, and unplug the power cord(s) from the system and wall outlet.

When handling the FP board, observe the normal safety and ESD precautions. See Appendix A: Safety Information for more information.

#### Removing the Old Front Panel Board

1. Remove any SD flash cards in the SD module slots to save for use with the new FP board.
2. Unscrew the two fasteners on the FP board (Figure 40, "A") and slide the board away from the front of the chassis and over the two keyhole standoffs ("B") to lift it up and out of the chassis. ("C") Save the screws for reuse with the new replacement FP board.

Figure 40: Removing the Front Panel Board from the Chassis

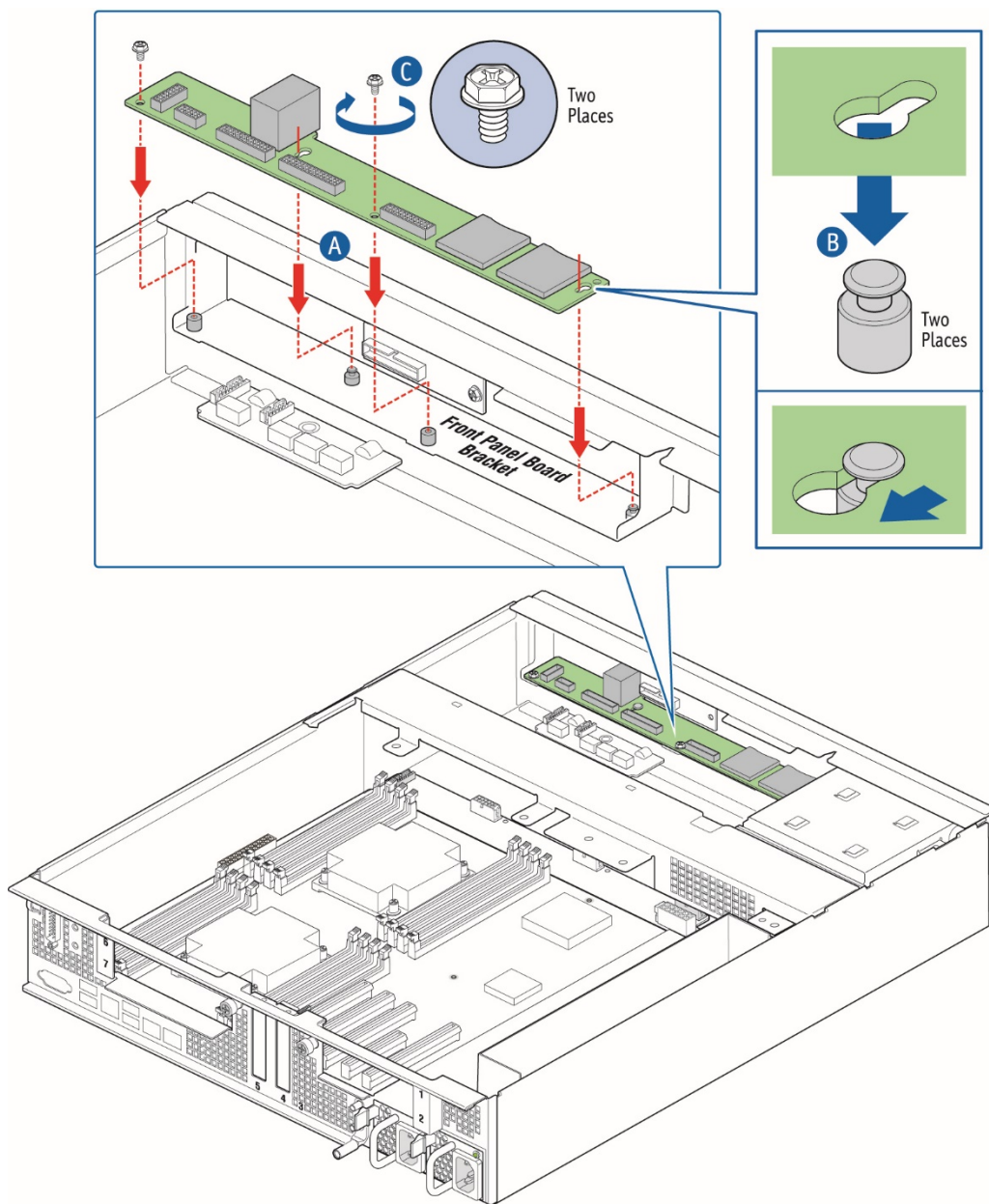


CG00357

### Installing the New Front Panel Board

1. Tilt the new FP board and slide it toward the front of the chassis so the RJ45 COM2 and USB connectors fit through the slot on the front panel of the chassis and the two keyhole slots fit over the standoffs on the front panel board shelf bracket. (Figure 41 "A" and "B").
2. Replace and tighten the screws on the board to secure the board to the front panel shelf bracket. ("C")

Figure 41: Installing the New FP Board



CG00358

3. Reconnect all of the cables on the FP board. For locations of each header on the board, see Figure 39.
4. Re-install the fan cage, the baseboard power cables, the support cross bar, and the chassis cover. For instructions, see (RC), (RG), (RH), and (RL).
5. If this is the last task you are performing inside the chassis, plug in the power cord(s) and re-attach any peripheral devices.



### 5.2.15 Replacing the LED/Switch Board

The LED/switch board is mounted against the front panel of the CG2300 server chassis because it supports the LEDs and switches that are on the control panel on the front of the chassis.

Before you can replace the LED/switch board, you must first remove the chassis cover, the front bezel, and the fan cage so you can access the board from the back. You may also have to loosen the front panel board and slide it back, in order to access the LED/switch board retaining screw. For instructions, see (A), (I), and (G) in Chapter 4.

#### Removing the Old LED/Switch Board

To remove the LED/Switch board:

1. Disconnect the multifunction cable on the FP board so there is enough room to unfasten the retainer screw on the top right side of the LED/switch board.  
If there is not enough room to access this screw, remove (or at least slide back) the FP board. For instructions, see “Removing the Old Front Panel Board” in Section 5.2.14.
2. The LED/switch board is also attached to the front of the chassis by two standoffs. Once the retaining screw is removed, pry the LED/switch board loose from these standoffs to remove it.

#### Replacing the LED/Switch Light Pipe Assembly

1. Remove the black control panel module from the front of the chassis by lifting up from the bottom and then pulling down to release the top tabs holding it into the chassis frame.
2. Position the new control panel module with the top tabs in the appropriate slots. Gently push down and in to secure the bottom of the panel in order to attach it to the LED/switch board.

#### Installing the New LED/Switch Board

1. Connect the LED/switch board power and signal ribbon cable to the new LED/switch board.
2. Align the left side of the LED/switch board with the two standoffs on the inside of the front panel of the chassis and gently push the board to secure it to the chassis frame.
3. Fasten the screw at the right of the LED/switch board to hold the board in place.
4. Replace the front panel board if you removed it or slid it out to work on the LED/switch board installation. For instructions, see “Installing the New Front Panel Board” in Section 5.2.14.
5. Re-connect the multifunction cable on the FP board.
6. Re-install the fan cage, the baseboard power cables, the front bezel, and the chassis cover. For instructions, see (RC), (RG), (RA), and (RL) in Chapter 6
7. If this is the last task you are performing inside the server chassis, plug in the power cord(s) and re-attach any peripheral devices.

### 5.2.16 Replacing the Telco Alarms Module (TAM) Board

The TAM board is on the right side of the CG2300 server chassis floor, just below the front panel. Before you can replace the TAM board, you must first remove the chassis cover, the support cross bar, the baseboard power cables, and the fan cage. (You do not have to remove the front panel board in order to access the TAM board). For instructions, see (A), (D), (E1), and (G)

**CAUTION:** Before replacing any of the boards on the CG2300 server, first take the server out of service, turn off all peripheral devices connected to the server, turn off the server by pressing the power button, and unplug the power cord(s) from the system and wall outlet.

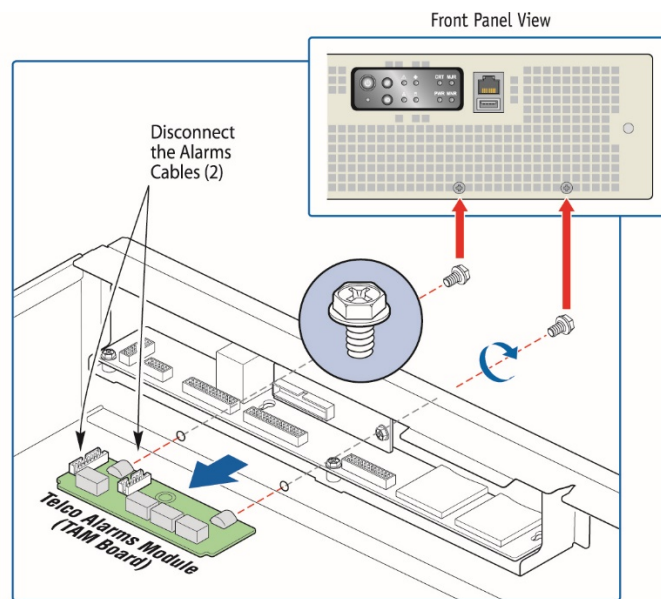
When handling the TAM board, observe normal safety and ESD precautions. (See Appendix A: Safety Information” for more information.

## Removing the Old TAM Board

To remove the TAM board:

1. Unfasten the two retaining screws from the front of the chassis. (Figure 42)
2. Disconnect the TAM signal cable that is connected to the FP board. (Figure 42)
3. Disconnect the alarms cable that is routed to the rear of the chassis. (Figure 42)
4. Remove the TAM board from the chassis by pulling it away from the front panel of the chassis. (Figure 42)

Figure 42: Removing the TAM Board



CG00093

## Installing the New TAM Board

1. Slide the new TAM board toward the front panel and align it with the two holes for the retaining screws. (Figure 42)
2. Fasten the retaining screws from the front panel of the chassis to hold the board in place. (Figure 42)
3. Connect the alarms cable from the FP board to the TAM board. (Figure 42)
4. Connect the alarms cable from the rear of the chassis to the TAM board. (Figure 42)
5. Re-install front bezel, the fan cage, the baseboard power cables, the support cross bar, and the chassis cover. For instructions, see (RA), (RC), (RG), (RH), and (RL) in Chapter 6.
6. If this is the last task you are performing inside the server chassis, plug in the power cord(s) and re-attach any peripheral devices.

### 5.2.17 Replacing the Fan Control Board (FCB)

The fan control board is located on the chassis floor in front of the server board and just behind the fan cage and the cable tray. The fan control functions are controlled by the fan controller IC. This controller monitors the “Fan Present” signals from each of the fan positions, drives the “Fan PWM” signals, monitors the “Fan Tach” signals, and drives the “Fan Fail” signals. Fan speed is controlled using temperature sensors located on the server board. When a fan fault is detected the fan controller drives the “Fan

Fault” signal “ON” in the fault LED on the fan assembly. Simultaneously, a composite fan fault LED, visible at the chassis front bezel, is turned “ON” on the front panel LED board.

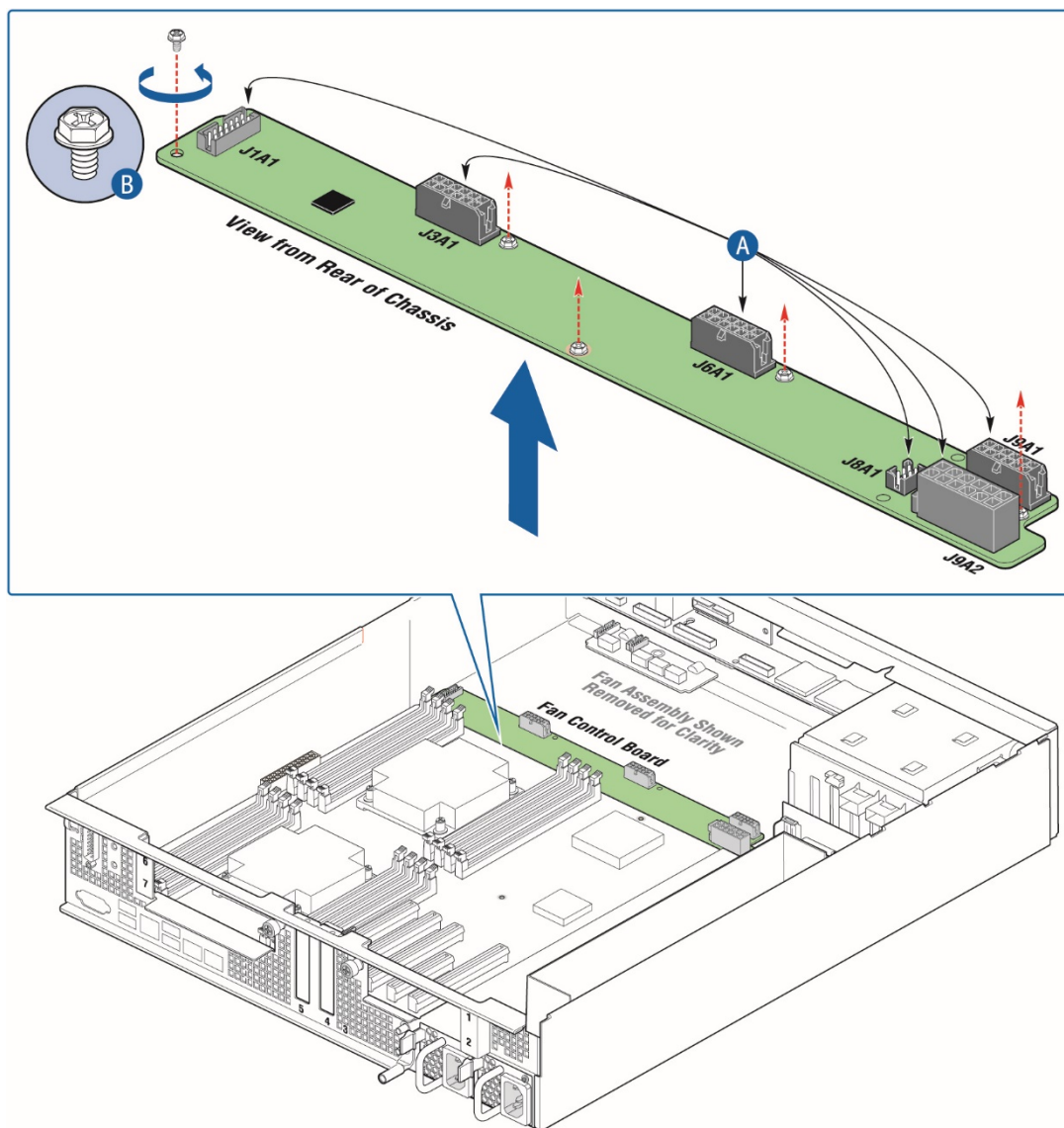
Before you can replace the fan control board, you need to remove the chassis cover, the support cross bar (and all components attached to it), the baseboard power cables, the fan cage and the FCB cables. For instructions, see (A), (D), (E1), (G), and (E5) in Chapter 4.

### Removing the Old FCB

To remove the fan control board from the chassis:

1. Three fan cables for the fan pairs (if not already disconnected when removing the fan cage)
2. Unfasten the five screws on the fan control board that fasten it to the chassis floor. See Figure 43 for the locations of these screws. Save the screws to use when installing the new fan control board.
3. Lift the fan control board out of the chassis.

Figure 43: Fan Control Board Layout



CG00361

## Installing the New FCB

To install the new fan control board:

1. Using the five screws saved from removing the old board, fasten the new fan control board to the chassis floor. (Figure 43).
2. Re-connect the fan control cables. For instructions, see (RD) in Chapter 6.
3. Re-install the fan cage, the baseboard power cables, the support cross bar, and the chassis cover. For instructions, see (RC), (RG), (RH), and (RJ) in Chapter 6.
4. If this is the last task you are performing inside the server chassis, plug in the power cord(s), and re-attach any peripheral devices.

### 5.2.18 Replacing the Power Distribution Board (PDB)

The power distribution board (PDB) routes power from the power supply module(s) to the rest of the server through an integral wiring harness.

To replace the PDB, first remove the following components:

- » Top cover
- » Support cross bar and all components attached to it
- » SAS HDD backplane board
- » All cables from the PDB at the connections on the other end (The cables are soldered onto the PDB and the new board has a new set of cables attached.)
  - » Baseboard SSI main power cable (from the 24-pin connector on the baseboard; bundle soldered on the PDB)
  - » CPU and DIMM power cables (one for each CPU, from the 8-pin connectors on the baseboard; soldered on the PDB)
  - » Fan control board power cable (from the 12-pin connector on the fan control board, soldered on the PDB)
  - » HDD backplane board power cable (from the HSBP board, soldered on the PDB)
  - » Auxiliary I/O power dongle (from any auxiliary PCI adapters installed and routed out of the PCI air baffle, soldered on the PDB)
  - » Baseboard SSI power control signal cable (from the baseboard, soldered on the PDB)

For instructions, see (A), (D), (H), (E1), (E5), and (E4) in Chapter 4.

Refer to Figure 12: Cable Routing” and Table 1: Cable Connections” for the location of the connectors where each cable is disconnected.

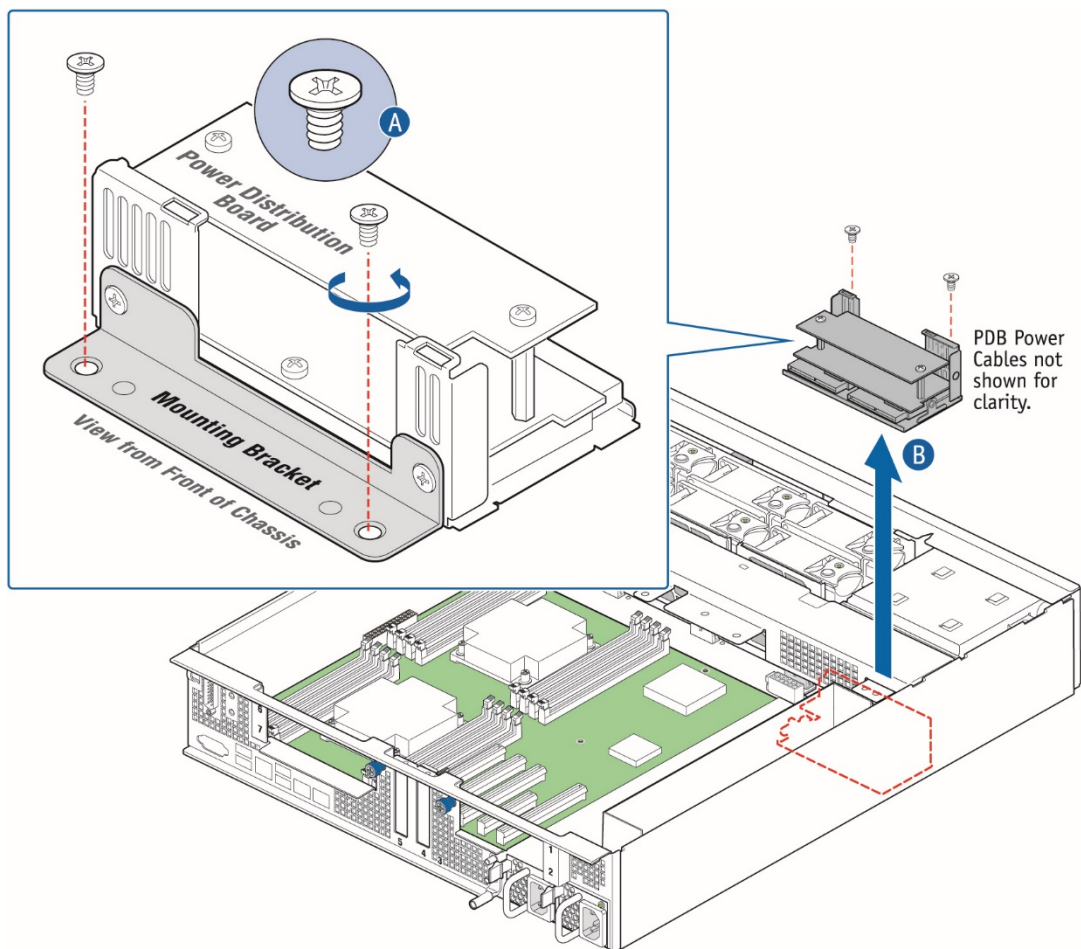
**CAUTION:** Before replacing any of the boards on the CG2300 server, first take the server out of service, turn off all peripheral devices connected to the server, turn off the server by pressing the power button, and unplug the power cord(s) from the system and wall outlet.

When handling the power distribution board, observe the normal safety and ESD precautions. See Appendix A: Safety Information for more information.

#### Removing the Old PDB

1. Slide the power supply module(s) out a few inches to disengage it from the PDB.
2. Loosen the two screws that secure the PDB bracket to the chassis and save them for re-installing the new PDB assembly. (Figure 44, “A”)
3. Gently pull the PDB and all its attached cables out of the chassis. (“B”).

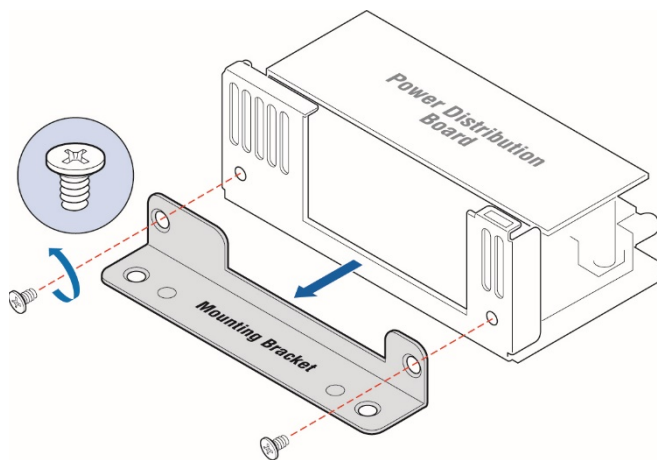
Figure 44: Removing the PDB from the Chassis



CG00370

4. Remove the bracket from the PDB and save it and the two screws for use with the new PDB. (Figure 45)

Figure 45: Removing the PDB Mounting Bracket

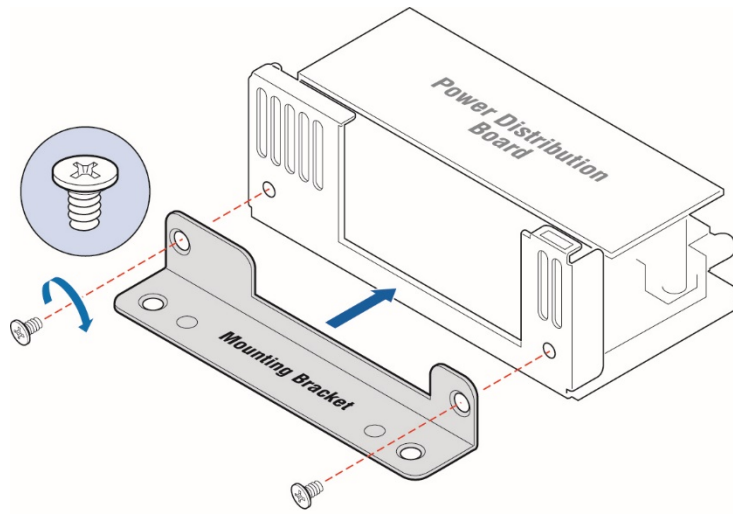


CG00116

## Installing the New PDB

1. Fasten the PDB bracket to the new PDB with the two screws reserved from removing the old PDB. (Figure 46)

Figure 46: Attaching the PDB Mounting Bracket

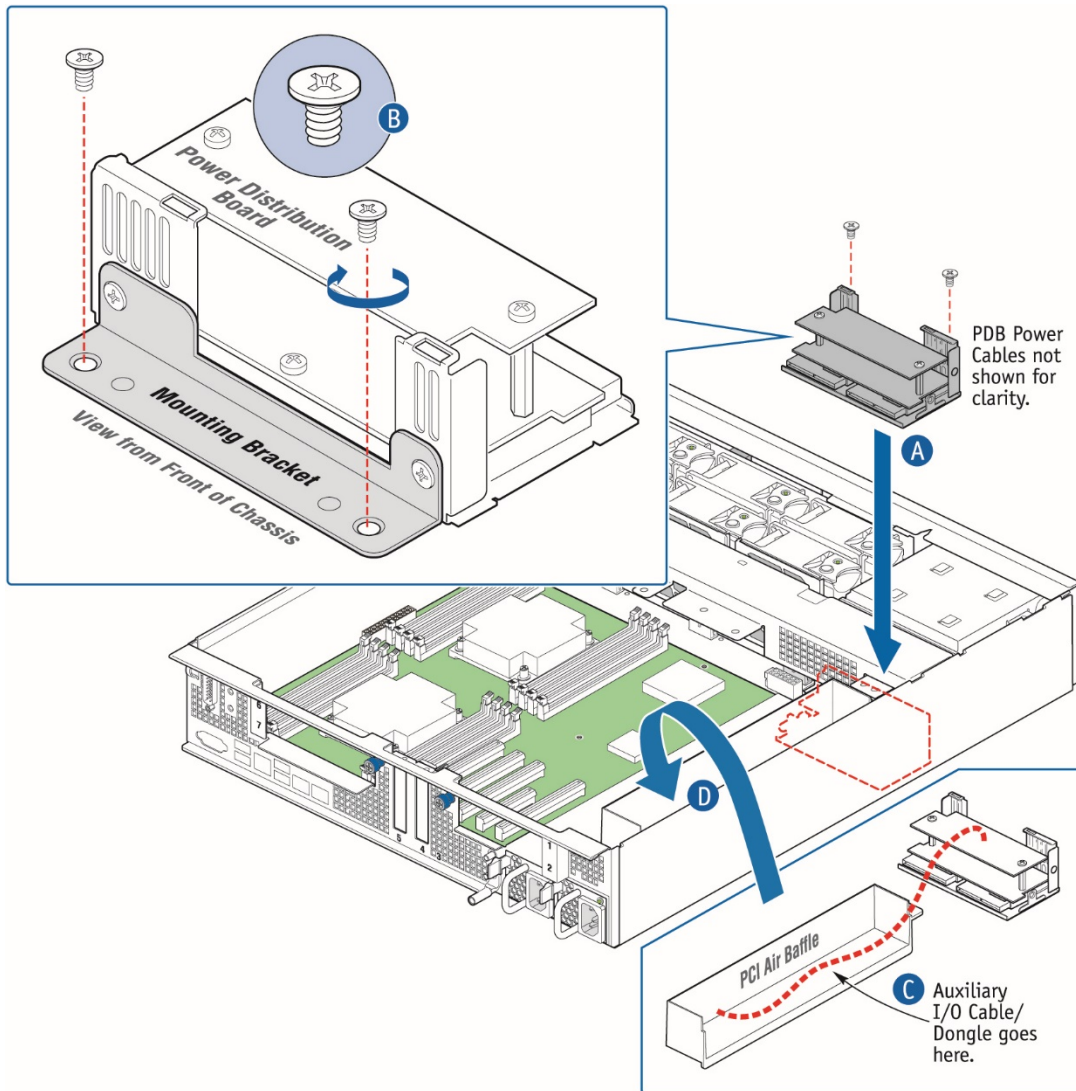


CG00117

2. Place the PDB back into the chassis and fasten the bracket to the chassis floor with the remaining two screws. (Figure 47, "A" and "B").



Figure 47: Installing the New PDB in the Chassis



CG00366

3. Connect all of the new cables on the new PDB to their connectors on the SAS backplane, server board, and fan control board, being careful to route them as low as possible so as not to interfere with other components or air flow. For instructions, see (RE), (RG), and (RD) in Chapter 6.
4. Place the new auxiliary I/O cable/dongle in the PCI air baffle and re-attach the baffle to the side wall of the chassis. (Figure 47, "C" and "D")
5. Re-install the SAS HDD backplane board and surrounding air baffle, the support cross bar, and the chassis cover. For instructions, see (RB), (RH) and (RL) in Chapter 6.
6. Push the power supply module(s) back into place so they are mated with the PDB.
7. If this is the last task you are performing inside the server chassis, plug in the power cord(s), and re-attach any peripheral devices.

### 5.2.19 Replacing the S2600CW2SK Server Board

The CG2300 Carrier Grade Server uses the Intel® server board S2600CW2SK. To replace the server board, the following components must be removed first:

- » Top chassis cover
- » Riser card assemblies
- » Processor air duct
- » RMM4Lite key (if used)
- » Hardware RAID controller board (if used)
- » SuperCap battery backup (if used)
- » eUSB module (if used)
- » .M. 2 module (if used)
- » Support cross bar
- » All cables attached to the baseboard:
  - » Baseboard power cables
  - » Baseboard signal cables
  - » Fan I2C cable
  - » Front panel board USB cable
  - » SAS 1 cable and SAS 2 cable (which will be on baseboard or the hardware RAID board, if used)
  - » HSBP I<sup>2</sup>C/HDD LED cable

For instructions, see (A), (B), (C), (D), (E), and (F) in Chapter 4, and the following other sections:

5.2.7: “Installing a Hardware RAID Controller”, 5.2.11: “Installing the RMM4 Lite Key”, 5.2.12: “Installing an M.2 Storage Drive”, and 5.2.13: “Installing an eUSB Module”.

In addition, you will probably want to remove the following components for reuse on the replacement server board if it hasn't already been populated with spare components:

- » Heat sink(s)
- » Processor(s)
- » All DIMMs

For instructions, see the following sections: “Removing a Heat Sink” and “Removing a Processor” in 5.2.4 and 5.2.3: “Replacing or Removing Memory DIMMs”.

If you want to reuse components from this server board, you can remove them now or after you have removed the server board from the chassis.

**CAUTION:** Before replacing any of the boards on the CG2300 server, first take the server out of service, turn off all peripheral devices connected to the server, turn off the server by pressing the power button, and unplug the power cord(s) from the system and wall outlet.

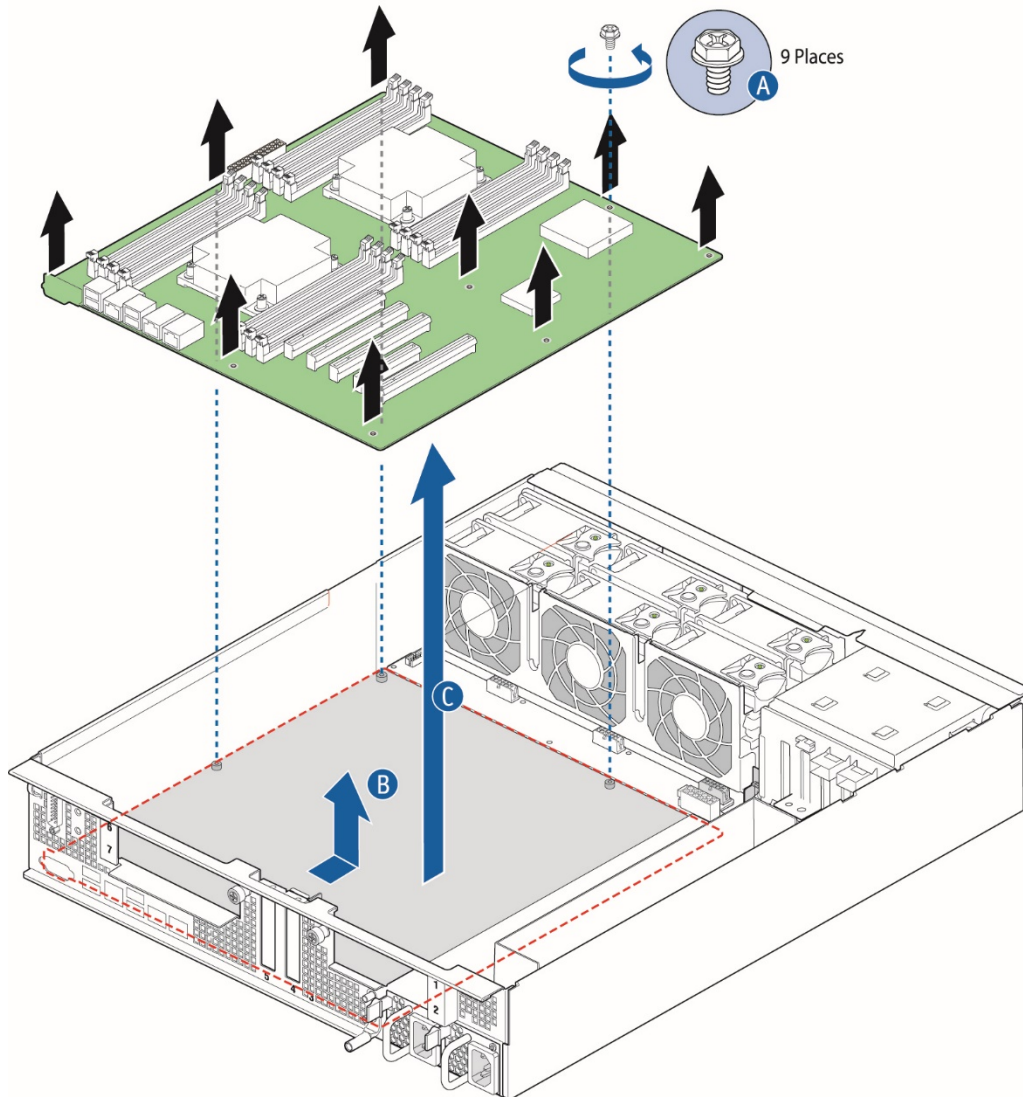
When handling the server board, observe the normal safety and ESD precautions. See Appendix A: Safety Information for more information.

#### Removing the Old Server Board

1. Loosen all nine screws holding the server board to the chassis and save them for use with the new server board. See Figure 48 “A” for the location of these screws.

2. Unscrew the standoff for the eUSB module and save it for reuse with the new server board.
3. Tilt the server board up at the front edge and lift it from the chassis being careful to clear the rear panel of the chassis. (Figure 48, "B" and "C")

Figure 48: Removing the Server Board



CG00360

### Installing the New Server Board

1. Set the replacement server board in place.  
Insert the rear edge of the board first and line up the I/O ports with the slots in the rear panel of the chassis.
2. Make sure all three self-aligning standoffs go through the holes at the front of the board.

**NOTE:** If the standoffs are misaligned when the board is screwed down the holes will be damaged and the standoffs may be cross-threaded.

3. Fasten the server board to the chassis base with the nine screws that were removed and saved.
4. If the new server board does not have components pre-installed and you are re-using components from the old server board, re-install the memory DIMMs, processor(s), and heat sink(s).  
For instructions, see Section 5.2.3 “Replacing or Removing Memory DIMMs”, 5.2.4 “Adding or Replacing a Processor” and 5.2.5 “Installing a Heat Sink”.
5. Re-install RMM4Lite key, if used, the hardware RAID controller board and battery backup, if used, the eUSB module, if used, the M.2 flash drive, if used.  
For instructions, see 5.2.11 “Installing the RMM4 Lite Key”, 5.2.7 “Installing a Hardware RAID Controller” and 5.2.13 “Installing an eUSB Module”.
6. Re-install all cables disconnected when the old server board was removed, the support cross bar, the processor air duct, the riser card assemblies, . For instructions, see (RE), (RF), (RG), (RH), (RJ), and (RK) in Chapter 6.
7. Re-connect the TAM alarms cable to the alarms connector on the chassis rear panel. For instructions, see “Installing the New TAM Board” in 5.2.16.
8. Re-install the chassis cover. For instructions, see (RL) in Chapter 6.
9. If this is the last task you are performing inside the server chassis, plug in the power cord(s), and re-attach any peripheral devices.

### 5.2.20 Replacing the SAS Backplane

The six-slot SAS backplane board is located at the rear of the HDD drive bay assembly. It is held in place by a cover plate on top of the HDD bay assembly that goes over the top edge of the backplane board. There is also a black plastic air duct surrounding the drive bay on the right side and rear of the assembly.

**CAUTION:** Before replacing any of the boards on the CG2300 server, first take the server out of service, turn off all peripheral devices connected to the server, turn off the server by pressing the power button, and unplug the power cord(s) from the system and wall outlet.

When handling the SAS backplane board, observe the normal safety and ESD precautions. See “Appendix A: Safety Information” for more information.

#### Removing the Old SAS Backplane Board

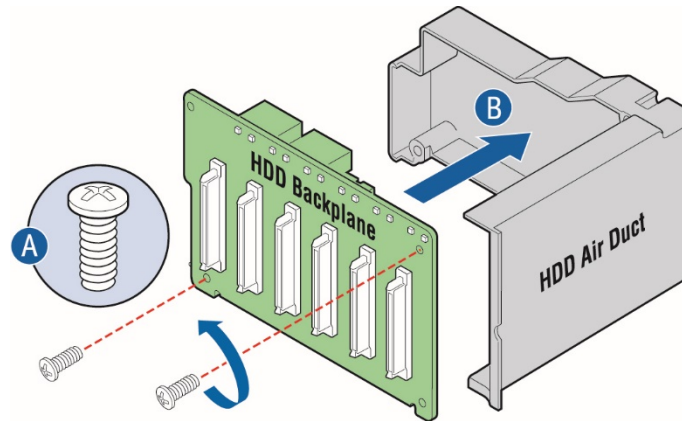
In order to replace the SAS backplane board, you need to first remove the following components: the chassis cover and the front bezel. For instructions, see (A) and (I) in Chapter 4.

Once the SAS backplane board is accessible, you also need to disconnect the power cable and the two SAS connectors. For instructions, see (E4) in Chapter 4.

**NOTE:** The complete procedure for removing the SAS backplane board is covered in (H) in Chapter 4.

1. Once the backplane board is removed and the cables disconnected, remove the HDD air duct from the old backplane board by loosening the two screws on the backplane. (Figure 49, “A”)
2. Save the air duct to reuse with the new board. (“B”)

Figure 49: Removing the Air Duct from the Backplane Board



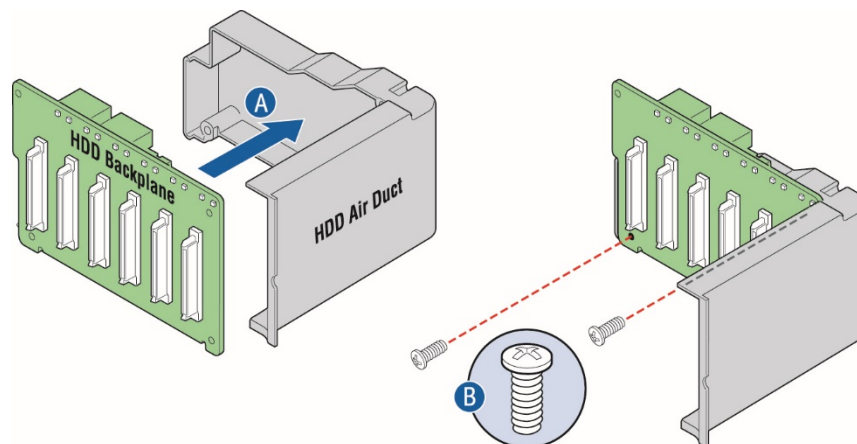
CG00363

### Installing the New SAS Backplane Board

**NOTE:** The complete procedure for reassembling the backplane board, cables, air duct, and cover plate is (RB) in Chapter 6.

1. Attach the HDD air duct to the new SAS backplane board using the two retained screws. (Figure 50, “A” and “B”)
2. Connect the four cables into the back of the backplane board. Be careful that the HSBP I<sup>2</sup>C/HDD LED cable does not catch on the corner of the backplane board or the air duct. For instructions, see (RE) in Chapter 6.
3. Secure the six-slot HDD backplane in place with the cover plate, lock in the hard drives, re-attach the front bezel and the chassis cover. For instructions, see (RB) in Chapter 6.
4. If this is the last task you are performing inside the server chassis, plug in the power cord(s), and re-attach any peripheral devices.

Figure 50: Re-Attaching the Backplane Board to the Air Duct



CG00385

## 5.3 Tasks with the Chassis Closed

The procedures covered in this section all involve hot-swappable components that do not require disconnecting power to the system or removing the top chassis cover.

### 5.3.1 Adding or Replacing Hard Disk Drives

Up to six hot-swappable SAS hard disk drives can be installed in the CG2300 server. The drives go into carriers that connect to the SAS backplane board once the carriers with drives attached are inserted back into the drive bay slots. The CG2300 server ships with six drive carriers.

While you must remove the front bezel to add or replace a hard drive in one of the drive slots, it is not necessary to remove the chassis cover or to power down the system. The hard drives are hot-swappable.

**CAUTION:** If you install fewer than six hard disk drives, to maintain proper cooling the unused drive slots must contain the empty carriers with filler panels that ship with the server.

The CG2300 server does not support all SAS HDD or SATA SSD disk drives. To see a list of validated manufacturers and drive models, refer to the THOL. The latest version of the THOL is located on the Kontron support website at <http://kontron.com>. (Rack Mount Systems - CRMS - CG2300 - Test Hardware and Operating System List (THOL)).

**NOTES:**

SATA rotating HDDs are not recommended for use in this system because they are sensitive to rotational vibration from system fan blades.

The complete procedure for adding or replacing hard disk drives is covered in Section 3.1 “Adding or Replacing Hot-Swappable Hard Disk Drives”.

### 5.3.2 Adding or Replacing a Power Supply Unit

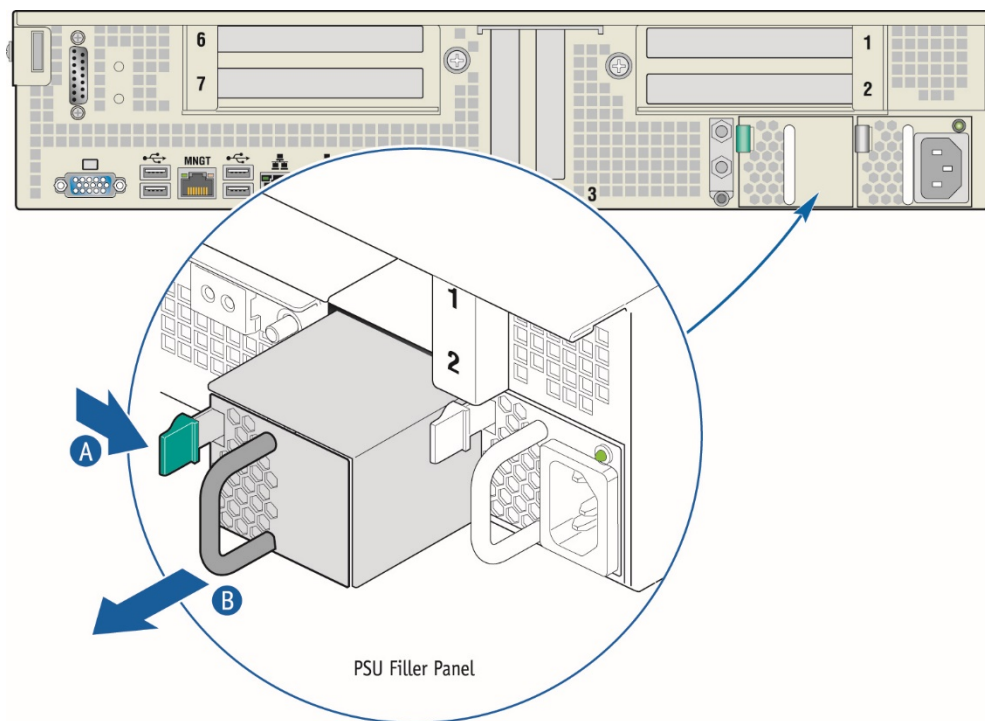
#### Adding a Second Power Supply Module

Depending on the model ordered, the server has one AC or one DC power supply module. A second power supply provides redundancy. The power supply modules are hot-swappable, so no chassis components have to be removed to add or replace a module. To add a second power supply module:

1. Remove the filler panel by pressing and holding the green safety lock downward and using the handle to pull the filler panel out of the slot. (Figure 51 “A” and “B”)



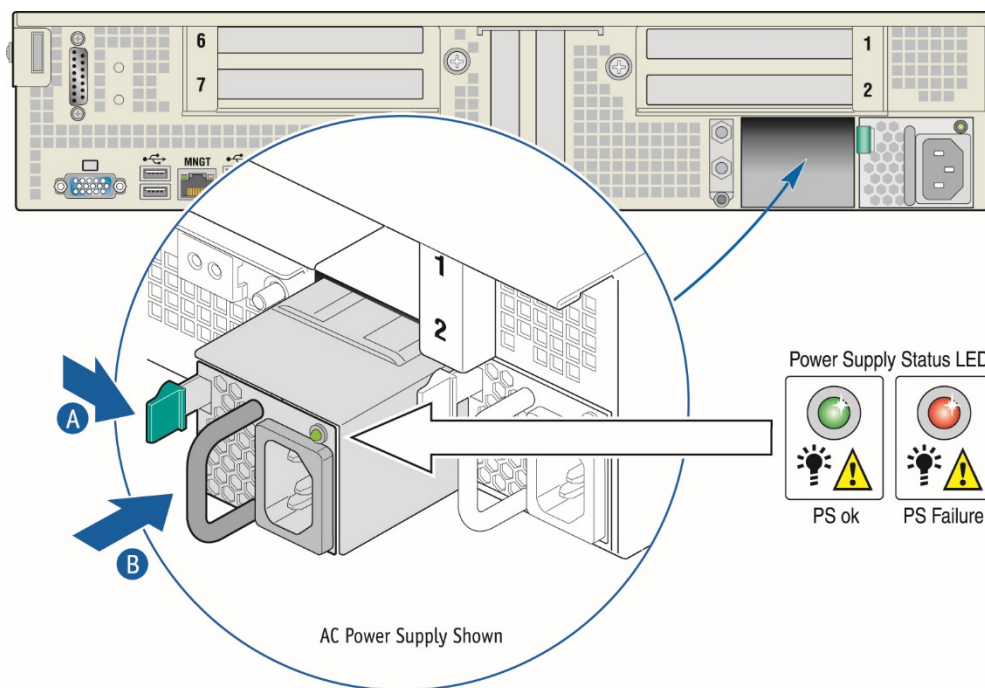
Figure 51: Removing the PSU Filler Panel



CG00354A

2. Insert the new power supply by pressing and holding the green safety lock downward (Figure 52, “A”) and using the handle to slide the power supply into the slot until it latches into place. (“B”)

Figure 52: Installing a PSU in the Second Slot

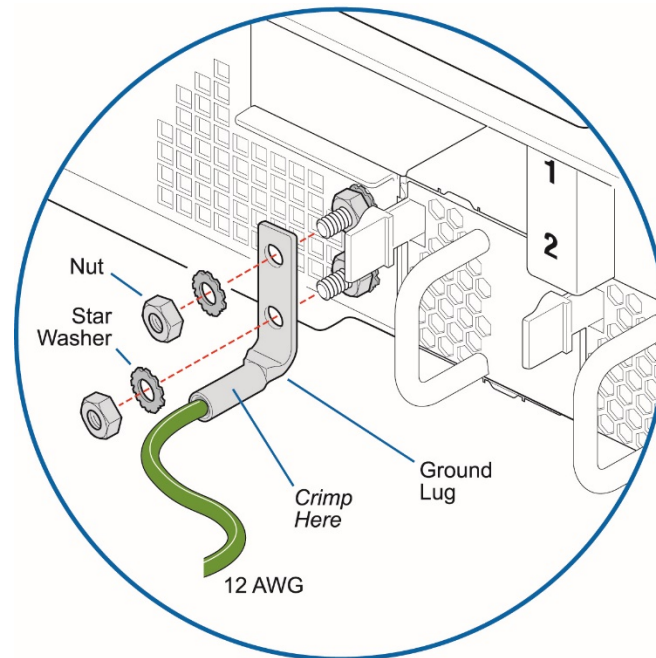


CG00374A



3. If you are installing a DC power supply, there are two threaded studs for chassis enclosure grounding. A 90° standard barrel, two-hole, compression terminal lug with 5/8-inch pitch suitable for a #14-10 AWG conductor must be used for proper safety grounding. A crimping tool may be needed to secure the terminal lug to the grounding cable.

Figure 53: DC Power Supply Grounding



CG00320A

### Replacing a Power Supply in Either Slot

Power Supply Units (PSUs) are hot-swappable, but you do need to unplug the power cord from the failed PSU to reconnect it with the new one. If you are replacing the main PSU and have a redundant PSU in your system, power will switch over to the redundant unit while you replace the main unit.

1. Unplug the power cord from the PSU being replaced. The Power Supply Status LED shows which power supply has failed. (Figure 52)
2. Press and hold the green safety lock downward and using the handle, pull the failed power supply out of the slot.
3. Press and hold the green safety lock downward ("A") and using the handle, slide the new power supply into the slot until it latches into place. ("B")

### 5.3.3 Installing the Server in a Rack

Several different rack mounting kits are available, depending on whether you need 2-post or 4-post mounting and whether you need 19-inch or 23-inch rack widths. Also available are a basic slide rail kit and a rail enabling kit. For detailed information about the rack mounting kits and how to order them, see the *CG2300 Carrier Grade Server Configuration Guide*. The latest version of the Configuration Guide is located on the Kontron support website at <http://kontron.com>. (Rack Mount Systems - CRMS - CG2300 - Ordering Guide). Installation instructions are included in each of the rack mounting kits.

## Connecting the Power Cord

**NOTE:** When using a rack, wait to install the power cord(s) until after the server is in the rack.

### Equipment Rack Precautions

**CAUTION: ANCHOR THE EQUIPMENT RACK** – The equipment rack must be anchored to an unmovable support to prevent it from falling over when one or more servers are extended in front of it on slide assemblies. The equipment rack must be installed according to the manufacturer’s instructions. You must also consider the weight of any other device installed in the rack.

**Mains power disconnect** – The power cord(s) is considered the mains disconnect for the server and must be readily accessible when installed. If the individual server power cord(s) will not be readily accessible for disconnection then you are responsible for installing a power disconnect for the entire rack unit. This main disconnect must be readily accessible, and it must be labeled as controlling power to the entire rack, not just to the server(s). To remove all power, two power cords must be removed.

**Grounding the rack installation** – To avoid the potential for an electrical shock hazard, for AC power you must include a third wire safety ground conductor with the rack installation. For DC power the two studs for chassis enclosure grounding must be used for proper safety grounding. See Figure 53 in Section 5.3.2, “Adding or Replacing a Power Supply Unit” for the location of the ground studs. With AC power, if the server power cord is plugged into an outlet that is part of the rack, then you must provide proper grounding for the rack itself. If the server power cord is plugged into a wall outlet, the safety ground conductor in the power cord provides proper grounding only for the server. You must provide additional, proper grounding for the rack and other devices installed in it.

**AC overcurrent protection** – When AC power is used, the server is designed for a line voltage source with up to 20 amperes of overcurrent protection per cord feed. If the power system for the equipment rack is installed on a branch circuit with more than 20 amperes of protection, you must provide supplemental protection for the server. The overall current rating of a server configured with two power supplies is less than 6 amperes.

**CAUTION: Temperature** – The operating temperature of the server, when installed in an equipment rack, must not go below 5°C (41°F) or rise above 40°C (104°F). Extreme fluctuations in temperature can cause a variety of problems in the server.

## 5.3.4 Preparing Power Cable

### DC power cable

In order to bring power to the unit, a power cable must be built. Each CG2300’s DC Power Supply is shipped with its mating connector kit. Below is the procedure and details to build the power input cable, using the provided mating connector kit. A video of the assembly procedure is also available here: <https://youtu.be/8JFkm2o0sCk>

To order spare DC mating connector kit, please use CG2300’s Ordering/Configuration Guide.

#### Included in the bag:

Description	Quantity
Mating connector/pins housing	1
Housing backshell	1
Connector pin (FC112N2S/AA-15)	3
Strain relief plate	1
Strain relief screws (round head)	2
Backshell screws (flat head)	2

### Cable Selection

The cable must include three wires. Ideally, one red for RTN (+VDC), one black for -VDC and one yellow/green for earth GND. Kontron recommends 12AWG wires with a minimum 90°Celsius rated insulation. See note below about system's maximum current.

### Crimping Pins

#### Crimping Tool

A crimping tool is needed to properly crimp the pins onto the wire. Positronic 9509-4-0-0 is the hand crimping tools recommended by the connector's manufacturer. Other « generic » crimping tools can also be used, such as DMC M22520/1-01 (P/N AF8) or Positronic PN 9501-0-0-0.

Refer to following document to use good crimping practices and not overcrimp the pins:

[http://www.connectpositronic.com/?media\\_dl=58251](http://www.connectpositronic.com/?media_dl=58251)

Prepare your crimping tool with appropriate settings. As an example, Kontron used a Style-1015 cable (stranded 12AWG, 600V, VW-1, 105 °Celsius, FT-1 rated insulation) along with the DMC AF8 tool with a setting of 16AWG to get a tensile strength of approximately 100 pounds. Note that the thickness and number of conductors in wire, the type of material of the conductor, the plating of the conductor and other characteristics will influence the tensile strength. On the DMC tool, the hole depth setting at 16/20 will give the appropriate depth so crimp indents are properly located into pin/contact barrel.

#### Crimping Pin Onto Wire

- Cut wire to get a flat perpendicular edge.
- Remove  $5.84 \pm 0.51\text{mm}$  ( $0.230 \pm 0.02$  inch) of the wire insulator
- In case of a stranded cable, twist the strands to fit into the barrel of the contact/pins.
- Insert all strands into the barrel. NOTE: this is tight for a 12AWG cable, requiring precise manipulations. A magnifying glass might help.
- Insert the pin/contact (and previously inserted wire) in the hole of the crimp tool.
- Crimp the pin/contact by pressing firmly handles of the hand crimp tool.
- Repeat for all three wires.
- Inspecting the crimped contacts

Make sure the crimped contacts you have just made are meeting these inspection criteria:

- Strands are visible through the inspection hole.
- Strands not to be visible between the insulation and barrel, i.e insulation finishes when crimp contact barrel starts.
- Crimped contact to meet recommended conductor tensile force shown in chart below.

Recommended Conductor Tensile Strength (Positronic)	
Wire Size (AWG/[mm <sup>2</sup> ])	Axial Load (Pounds/[N])
12 / [4.0]	110
14 / [4.0]	70
16 / [4.0]	50

- Check for peeled gold and bent contacts.
- It is also recommended that the crimp indents are located nearly the middle of the barrel, not too close to the inspection hole nor the other end of the barrel (wire insulation).

## Assembling Positronic Connector

Power Connection Systems

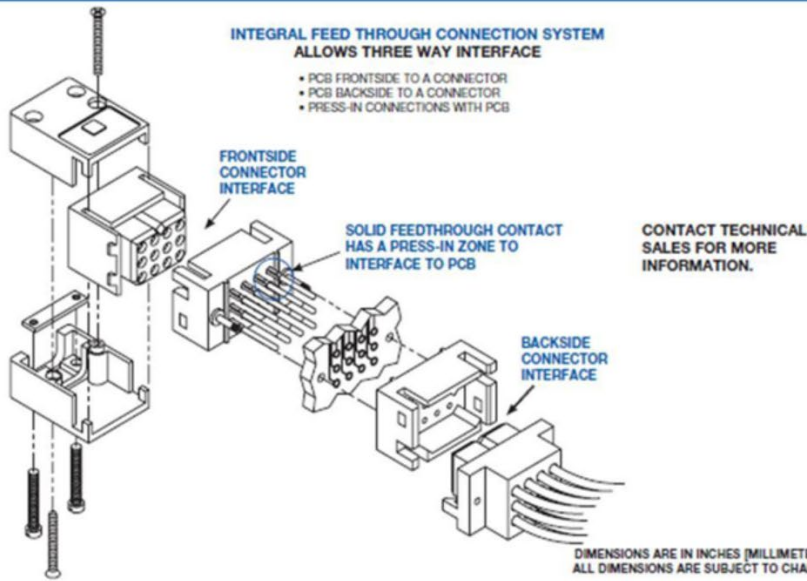
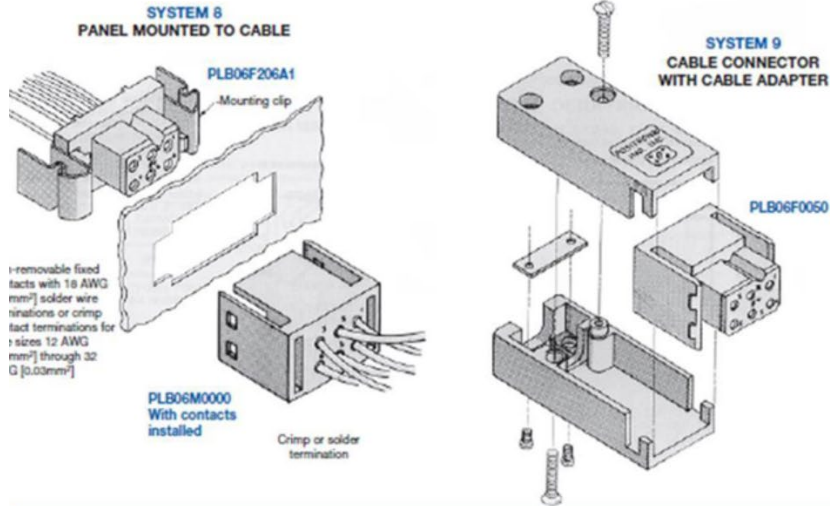
**CABLE AND INTEGRAL FEED THROUGH CONNECTION SYSTEMS**



Positronic  
connectpositronic.com

GENERAL INFORMATION

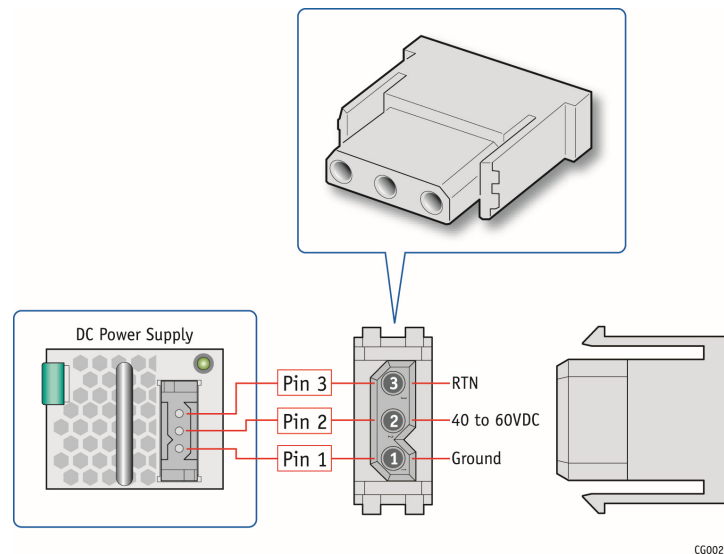
### PANEL MOUNT AND CABLE ADAPTERS



3

### Inserting pin/contact into the housing.

- Make sure you match this pinout: from top to bottom: RTN (+VDC), -VDC, and earth GND.



- When pinout is confirmed, then insert and clip-in the three wires of the power cable into the housing.
- Pull on the wires to make sure they are fully clipped in.

### Installing Strain Relief / Backshell

- Open the backshell
- Place the strain relief plate into the backshell. The plate goes into the small cavity at the back of the backshell.
- Take the housing and wires assembly you built and sit it into the backshell. The housing fits in the section on the opposite end from the strain relief plate.
- Route the wires to have the middle one underneath the two others.
- Close the backshell by placing the second part of the backshell on top of the assembly.
- On second part of the backshell you just installed, insert and screw both strain relief screws. Then, on the same side of the backshell, install the backshell screw.
- Flip the backshell on the other side and install the second backshell screw.

### NOTE about system's maximum current:

Maximum current used by your CG2300 depends on your system's configuration (CPU model, DIMMs, PCIe cards, HDDs, etc) and running application. The absolute maximum is given by the maximal capabilities of the power supply. By calculations, system will use, at worst-case 40VDC, an absolute maximum of 26A. Standard 12 AWG wire, with a 90°Celsius rated insulation is rated for 30A. Therefore, in order to cover for all possible scenarios, Kontron recommends 12AWG wires with a minimum 90°Celsius rated insulation, for the power cable.

### Tools

#### Crimp tool:

#### DMC:

[http://www.dmctools.com/store/catalog.asp?PRODUCT\\_ID=561526&BACK=%2Fstore%2Fcatalog%2Easp%3FKEYWORD%3DAF8](http://www.dmctools.com/store/catalog.asp?PRODUCT_ID=561526&BACK=%2Fstore%2Fcatalog%2Easp%3FKEYWORD%3DAF8)

**Positronic:** <http://www.posishop.com/store/default.aspx?tabname=Product%20Selection&SearchText=9501-0-0-0>

**Extraction tool :**

**Positronic :** <http://www.posishop.com/store/default.aspx?tabname=Product%20Selection&SearchText=9081-0-0-0>

**Positronic Reference Documents:**

- Removable Contact Tooling Cross Reference: [http://www.connectpositronic.com/?media\\_dl=34147](http://www.connectpositronic.com/?media_dl=34147)
- Strip Length Cross Reference: [http://www.connectpositronic.com/?media\\_dl=58250](http://www.connectpositronic.com/?media_dl=58250)
- How to Make A Good Crimp – Application Tools: [http://www.connectpositronic.com/?media\\_dl=58251](http://www.connectpositronic.com/?media_dl=58251)

NOTE: links above verified on December 2015

## 6 Reassembling Server Components

### 6.1 Before Beginning These Tasks

Before working with the server product, pay close attention to the safety instructions provided in this manual. See Appendix A, “Appendix A: Safety Information”

**WARNING:** Electrostatic discharge (ESD) and ESD protection: ESD can damage disk drives, boards, and other parts. We recommend that you perform all procedures in this chapter only at an ESD workstation. If one is not available, provide some ESD protection by wearing an antistatic wrist strap attached to chassis ground (any unpainted metal surface) on the server when handling parts.

**NOTE:** Except where noted, the tasks in this chapter require the server to be turned off and the power cord(s) and any peripheral devices attached to the server disconnected.

#### 6.1.1 Tools and Supplies Needed

- » #1 and #2 Phillips (cross-point) screwdrivers (or interchangeable tip screwdriver with #1 and #2 Phillips bits)
- » Personal grounding device such as an anti-static wrist strap and a grounded conductive pad

#### 6.1.2 System References

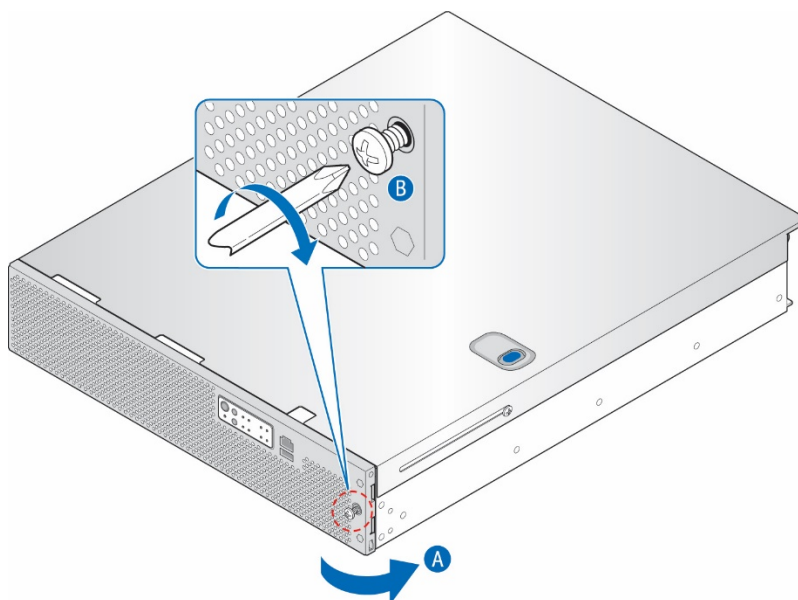
All references to left, right, front, rear, top, and bottom assume that you are facing the front of the server, as it would be positioned for normal operation.

### 6.2 (RA) Re-Installing the Front Bezel

**NOTE:** The server does not have to be powered down just to reinstall the front bezel.

1. Insert the tabs on the left side of the bezel into the slots on the front panel of the chassis.
2. Move the bezel toward the right and align it on the front panel pins. (Figure 54, “A”)
3. Snap the bezel into place and tighten the retention screw to secure it. (“B”)

Figure 54: Re-Attaching the Front Bezel



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### 6.3 (RB) Re-Installing the SAS Hot-Swap Backplane (HSBP) Board

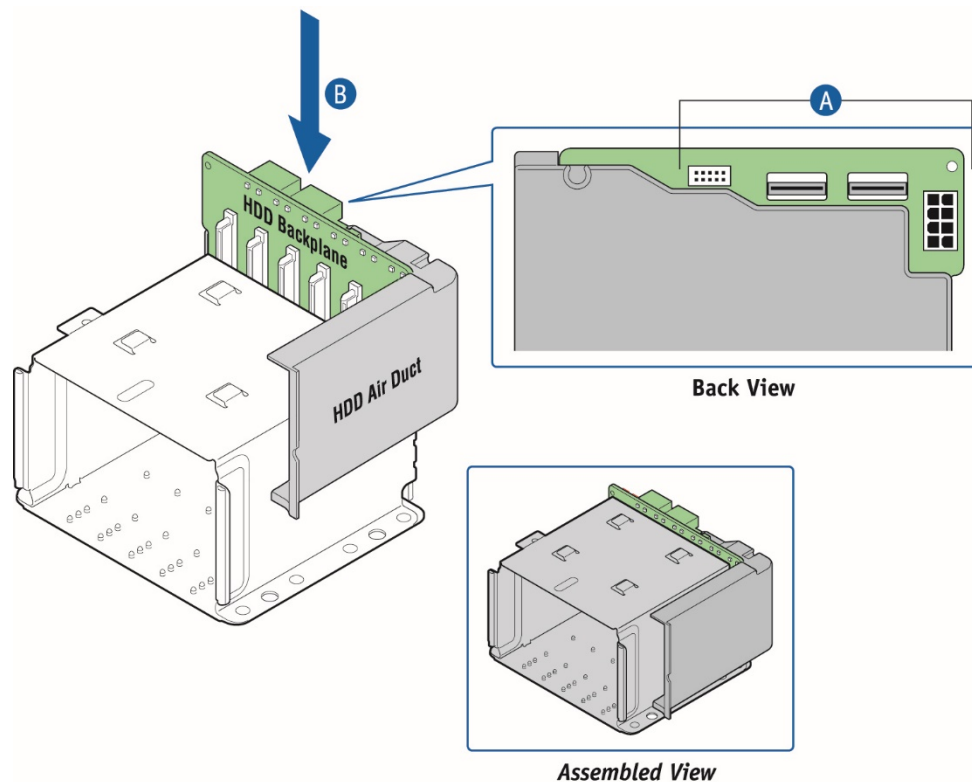
When handling the SAS backplane board, observe the normal safety and ESD precautions. See “Appendix A: Safety Information” for more information.

The six-slot SAS backplane board is held in place by a cover plate on top of the HDD bay assembly that goes over the top edge of the backplane board. There is also a black plastic air duct surrounding the drive bay on the right side and rear of the assembly.

To re-install the SAS backplane board:

1. Re-connect the four SAS HDD cables to the HSBP board. For instructions, see (RE) in Chapter 6.
2. Re-install the SAS backplane board and air duct. (Figure 55, “A” and “B”).

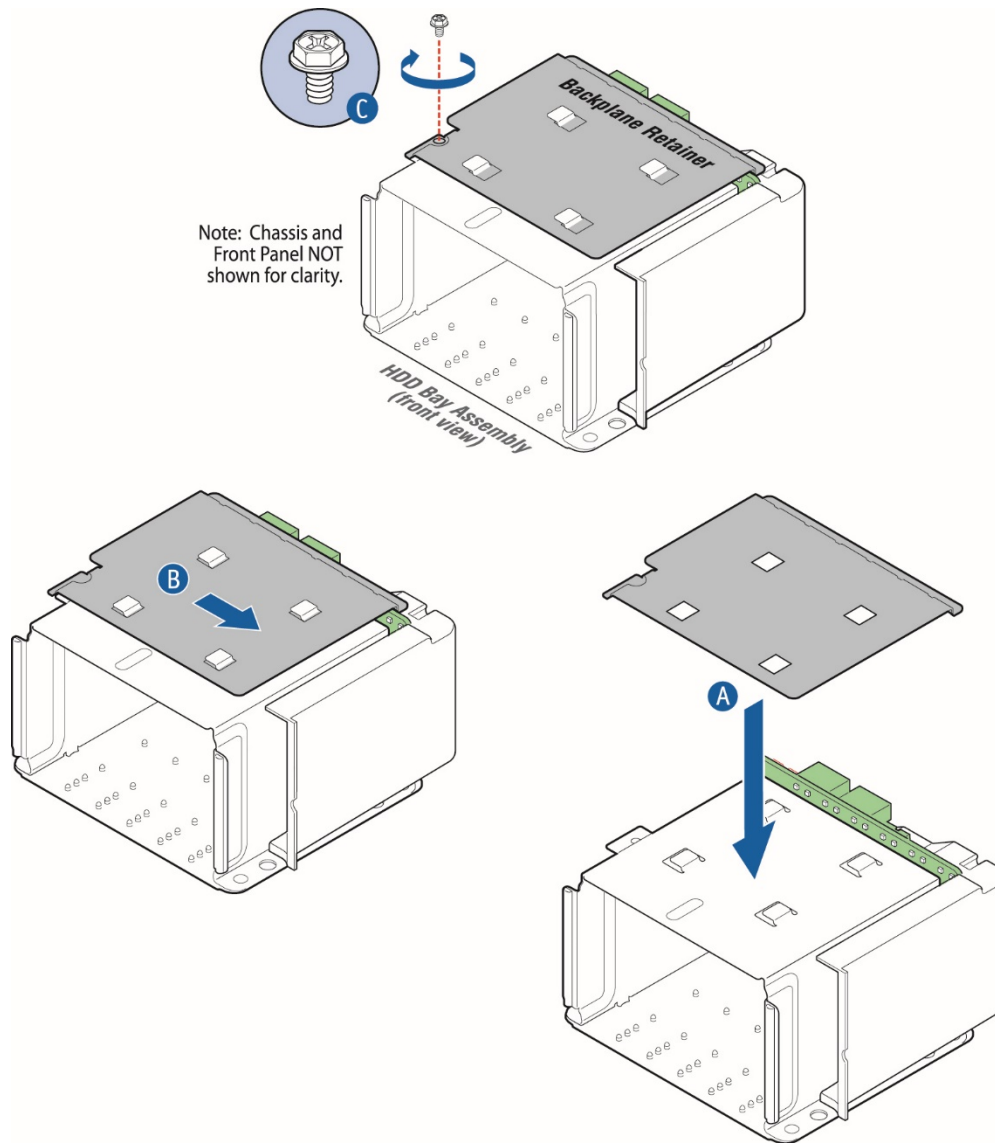
Figure 55: Re-Installing the Backplane Board



CG00384

3. Secure the six-slot HDD backplane in place by placing the cover plate over the HDD bay assembly, the backplane and the air duct. (Figure 56 “A” and “B”)
4. Re-fasten the screw that holds the cover plate in place. (“C”)

Figure 56: Re-Attaching the Cover Plate



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5. Lock in all the hard drives so they engage with the backplane.
6. Re-attach the front panel bezel and the chassis cover. For instructions, see (RA) and (RL) in Chapter 6.
7. If this is the last task you are performing inside the server chassis, plug in the power cord(s), and re-attach any peripheral devices.

#### 6.4 (RC) Re-Installing the Cable Bundle Bracket and Fan Cage

The cable bundle bracket is under the support cross bar and just behind the fan cage. It is attached to the fan cage by two small screws. Because both of these components need to be removed and are fastened together, they are treated as one assembly.

To re-install the cable bundle bracket and fan cage:

1. Fasten the fan cage (with the cable bracket attached) to the chassis floor using the two screws set aside when it was removed.

2. Reconnect all three power cables for the fan pairs on the fan control board. For instructions, see (RD) here in Chapter 6
3. Put the baseboard power cable bundles back onto the cable bundle bracket and re-connect the cables to the baseboard. For instructions, see (RG) here in Chapter 6.
4. Place the three fan pairs that were set aside back into the fan cage.

## 6.5 (RD) Re-Connecting the Fan Control Cables

The fan control board has the following cables:

- » Fan Control Board PWR/SIG cable, which is part of the FP board multifunction connection that coordinates signals to the front panel  
For the location of the FCB PWR/SIG connector (J1A1) on the FCB, see Figure 43 in Section 5.2.17.
- » Fan I<sup>2</sup>C cable, which connects the baseboard and the fan control board to provide fan control signals  
**NOTE:** This cable, also known as the IPMB cable, is covered in (RF) here in Chapter 6.
- » Fan Pair (Fans 1-2), Fan Pair (Fans 3-4), Fan Pair (Fans 5-6) cables, which each connect the FCB with a fan pair in the fan cage  
For the location of the three fan pair connectors (J3A1, J6A1, J9A1) on the FCB, see Figure 43 in Section 5.2.17.  
These cables are connected mechanically on the fan pairs in the fan cage.
- » Fan Control Board Power cable, which provides power from the PDB (soldered) to the FCB and the six fans  
For the location of the FCB power connector (J9A2) on the FCB, see Figure 43 in Section 5.2.17.

If any cables have to be reconnected at the other end, not just on the FCB, for the connector locations, see Figure 12, “Cable Routing” and Table 1, “Cable Connections”.

## 6.6 (RE) Re-Connecting the HSBP Board Cables

The following cables all connect to the hot-swap backplane board at the back of the SAS HDD drive bay assembly:

- » SAS HDD Backplane board power cable that provides power from the PDB to the HSBP and up to six SAS HDDs  
For the location of the power connector (J11) on the HSBP, see Figure 55 in (RB) here in Chapter 6.  
The other end of this cable is soldered onto the PDB.
- » SAS-1 (HDD 0-3) cable that connects the HSBP board to the SAS\_0-3 connector on the baseboard or to an optional hardware RAID controller board  
For the location of the SAS-1 connector (MINISAS0, J1) on the HSBP, see Figure 55 in (RB) here in Chapter 6.  
For the location of the SAS\_0-3 connector (J1H3) on the baseboard, see Figure 12: Cable Routing” in (E) in Chapter 4.  
For the location of the SAS-1 connector on a hardware RAID controller card, see Figure 30 in Section 5.2.7 “Installing a Hardware RAID Controller”.
- » SAS-2 (HDD 4-5) cable that connects the HSBP board to the SAS\_4-7 connector on the baseboard or to an optional hardware RAID controller board  
For the location of the SAS-2 connector (MINISAS1, J3) on the HSBP, see Figure 55 in (RB) here in Chapter 6.  
For the location of the SAS\_4-7 connector (J1H3) on the baseboard, see Figure 12: Cable Routing” in (E) in Chapter 4.  
For the location of the SAS-1 connector on a hardware RAID controller card, see Figure 30 in Section 5.2.7 “Installing a Hardware RAID Controller”.

Once you have reconnected the HSBP cables to the backplane board, you need to re-install the backplane board, replace the cover plate, replace the HDD carriers in the drive bay, and re-attach the front bezel. For instructions, see (RB) and (RA) here in Chapter 6.

## 6.7 (RF) Re-Connecting the Baseboard Signal Cables

Signal side cables connect to the baseboard on the left side. See Figure 12: Cable Routing” in (E) in Chapter 4.

## Baseboard to Front Panel Board Signal Cables

These cables all have a baseboard connection and a front panel board connection.

### SSI Front Panel Board Cable

The SSI front panel board signal cable connects the front panel board connector (J1) with the baseboard (SSI\_FRONT\_PANEL, J1A2).

For the location of the baseboard SSI front panel board connector, see Figure 12: Cable Routing” in (E) in Chapter 4.

For the location of the SSI power control signal connector on the FP board, see Figure 39 in Section 5.2.14.

### Serial Cable

The serial cable is part of the multifunction front panel board power and signal cable. As part of the multifunction front panel board cable, along with the HDD LED cable and COM2, the serial cable interconnects the front panel board (FP board) with the fan control board, the baseboard, and the HDD LEDs.

For the location of the multifunction cable connector on the FP board (J1A1), see Figure 39 in Section 5.2.14.

For the location of the serial connector on the baseboard (SERIAL\_A), see Figure 12: Cable Routing” in (E) in Chapter 4.

### Front Panel Board USB Cable

The front panel board USB cable connects the baseboard to the FP board to provide USB 2.0 signals.

For the location of the baseboard USB connector (USB-5-6, J1K1), see Figure 12: Cable Routing” in (E) in Chapter 4.

For the location of the USB connector on the FP board (J4), see Figure 39 in Section 5.2.14.

## Other Baseboard Signal Cables

### IPMB/Fan I<sup>2</sup>C Cable

The IPMB cable (aka Fan I<sup>2</sup>C) connects the baseboard with the fan control board (FCB) to provide fan control signals.

For the location of the IPMB connector (J1D4) on the baseboard, see Figure 12: Cable Routing” in (E) in Chapter 4.

For the location of the FCB I<sup>2</sup>C connector (J8A1), see Figure 43 in Section 5.2.17.

### HSBP I<sup>2</sup>C Cable

The HSBP I<sup>2</sup>C cable connects the HDD HSBP (hot-swap backplane) to the baseboard and the front panel board to provide HDD LED signal control on the disk drive carriers and on the system front panel.

For the location of the HSBP I<sup>2</sup>C connector (J2) on the HDD backplane, see Figure 55 here in (RB) Chapter 6.

For the location of the HSBP I<sup>2</sup>C/HDD LED connector (HDD-LED) on the FP board, see Figure 39 in Section 5.2.14.

For the location of the HSBP I<sup>2</sup>C connector (J1D3) on the baseboard, see Figure 12: Cable Routing” in (E) in Chapter 4.

## 6.8 (RG) Re-Connecting the Baseboard Power Cables

The four baseboard power side cables all run from the power distribution board, across the cable bundle bracket in a protective cover, to their connectors on the baseboard.

### Main Power

The baseboard SSI main power cable provides power to the baseboard and the power supply with the “PS-ON” signal from the power distribution board. The cable is soldered to the PDB and connected to MAIN\_PWR (J9G1).

For the location of the connector on the baseboard, see Figure 12: Cable Routing” in (E) in Chapter 4.

To reconnect the main power cable:

1. Run the cable bundle across the cable bundle bracket and connect it to the baseboard.
2. If present, re-cover with the black insulator covering.

### PMBus (SSI Power Control) Cable

This cable sends PMBus signals between the power supplies and the baseboard. It is soldered on the PDB side and connects to the baseboard PMBus connector (J9E1) on the other end.

For the location of the PMBus connector on the baseboard, see Figure 12: Cable Routing” in (E) in Chapter 4.

To reconnect the PMBus cable:

1. Run the cable across the cable bundle bracket and connect it to the baseboard.
2. Re-cover with the black insulator covering (if present).

### CPU 1 and CPU 2 Power Connectors

The CPU1 and CPU2 power cables bring power from the power distribution board to the CPUs (and their DIMMs).

Both cables are soldered to the PDB and only have connectors on the baseboard side.

The CPU1 cable connects to the baseboard at the front of the board near the CPU1 DIMMs, (CPU\_1\_PWR, J8K2).

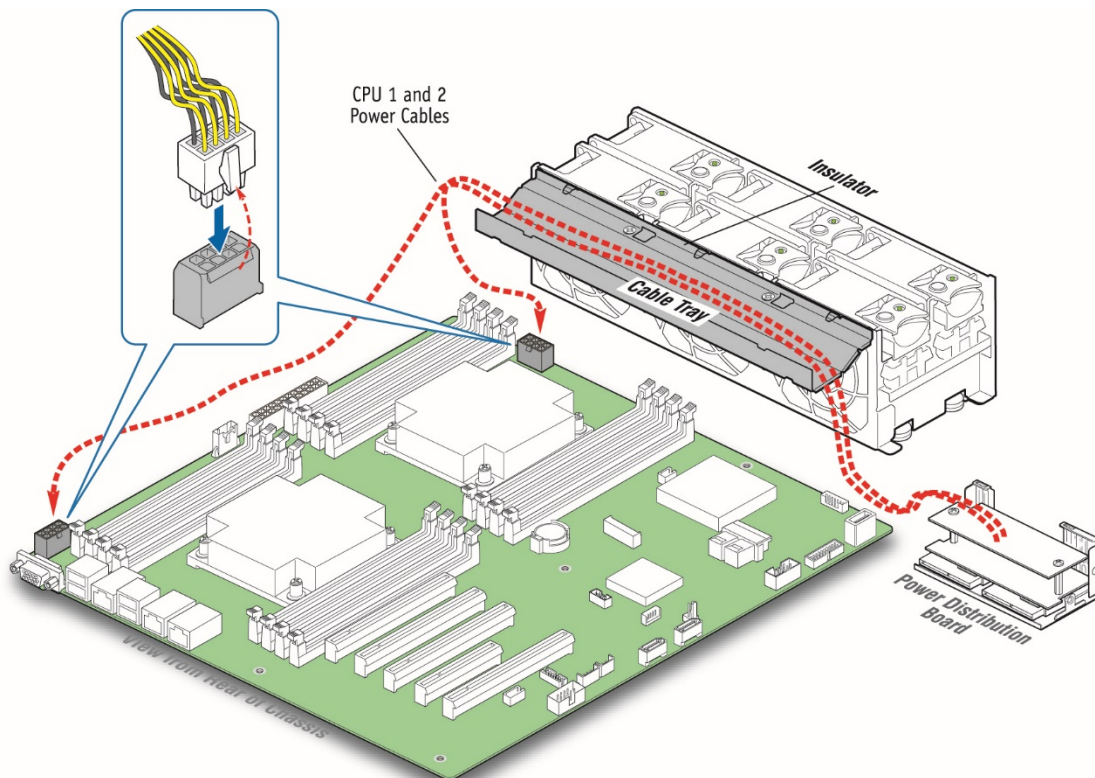
The CPU2 cable is routed through another black insulator along the right chassis wall to a connector at the rear right side of the board, (CPU\_1\_PWR, J9A2).

For the locations of these cables, see Figure 12: Cable Routing” in (E) in Chapter 4.

To reconnect the CPU1 and CPU2 power cables on the baseboard:

1. Run the cable bundles across the cable bundle bracket and connect them to the baseboard. (Figure 57)
2. Re-cover the black insulator covering the CPU 1 and CPU 2 power cable bundles in the cable bracket (if present).

Figure 57: Routing the CPU Power Cables



CG00367

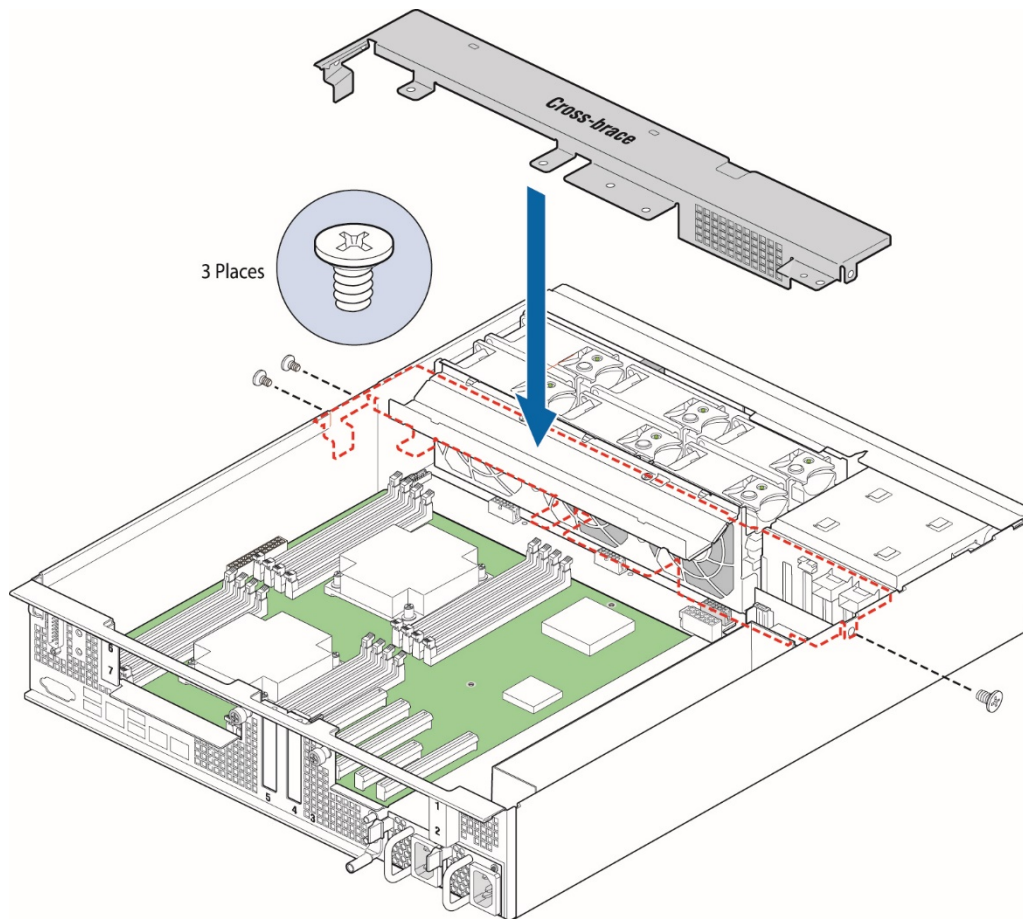
## 6.9 (RH) Re-Installing the Support Cross Bar

The support cross bar secures several components, some optional, in the chassis. It is the divider between the front and back. The top cover can be pushed back to the cross bar without powering down the system in order to service hot-swappable components in the front of the chassis. In contrast, some components in the front of the chassis, such as the front panel board or the power distribution board, cannot be replaced without first removing the cross bar (along with all the components attached to it). This procedure is necessary in order to have enough space to access these front chassis components.

To re-install the support cross bar:

1. Reposition the support cross bar in the chassis and secure it with the three reserved screws. (Figure 11)

**Figure 58: Re-Installing the Support Cross Bar**



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2. Re-attach each of the components that were removed from the support cross bar. Tighten the captive retentive screws. For the possible components and their positions on the cross bar, see Figure 10. For instructions about re-installing the processor air duct, the optional hardware RAID battery backup assembly and the riser card assemblies, see (RI), (RJ), and (RK) here in Chapter 6.

## 6.10 (RI) Re-Installing the SuperCap Battery Backup

Re-installing the SuperCap battery backup module entails fastening it to the support cross bar.

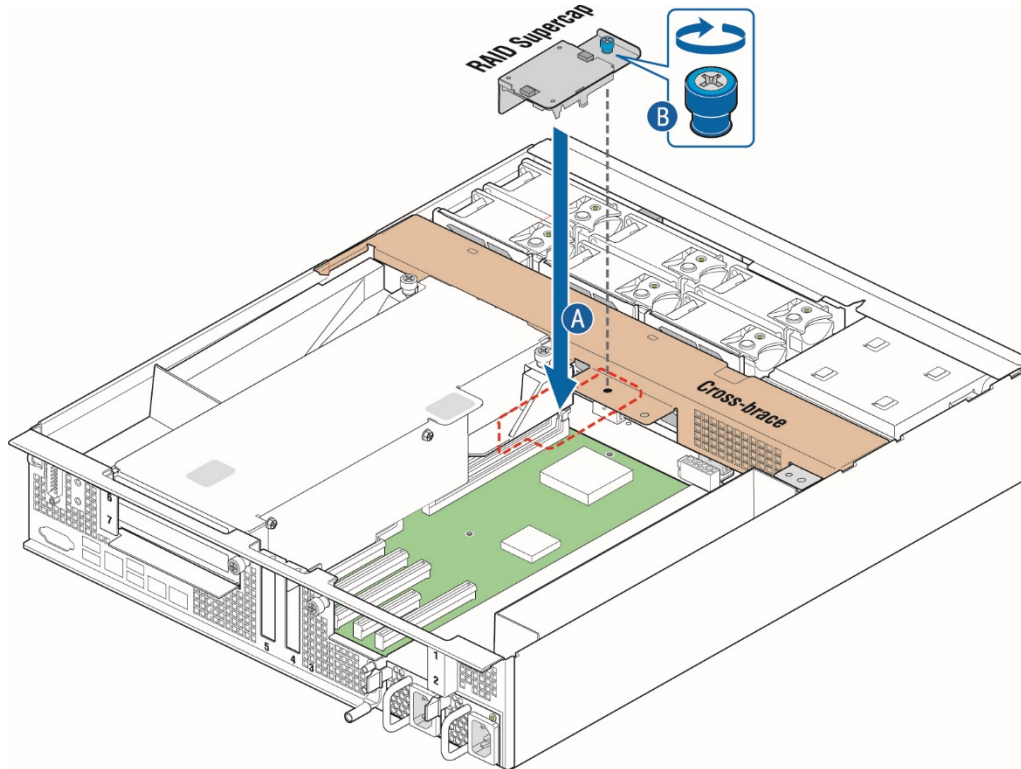
Figure 31 shows how the battery backup is connected to the hardware RAID controller and positioned on the support cross bar.



To re-install the battery backup module:

1. Position the SuperCap backup battery assembly over the support cross bar. (Figure 59, "A")
2. Tighten the captive screw that fastens the battery backup to the support cross bar. ("B")

Figure 59: Re-Installing the Battery Backup



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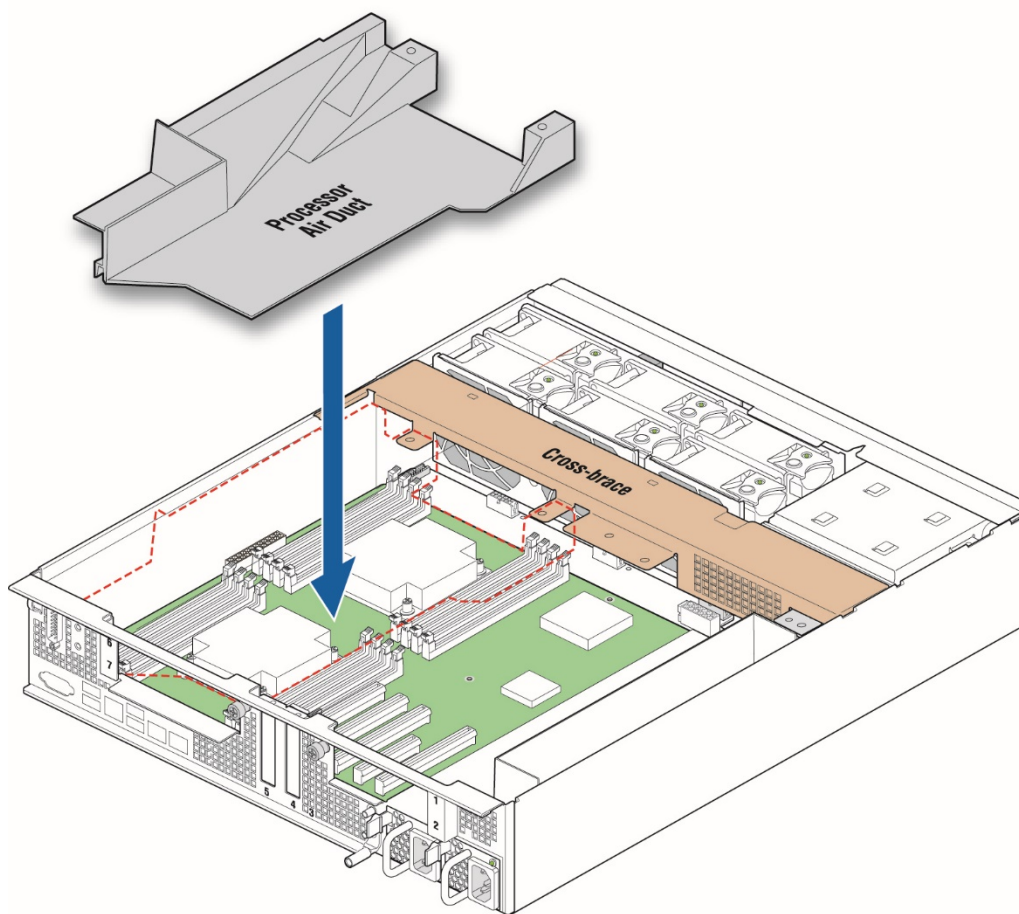
## 6.11 (RJ) Re-Installing the Processor Air Duct

The air duct is required to ensure proper air flow within the chassis, so be sure that it is in place again before re-installing the chassis cover.

1. Place the processor air duct over the processor sockets and DIMMs. Align the front tabs with the captive screws on the support cross bar. (Figure 60)  
(The air duct is secured when the right riser card assembly is mounted on the support cross bar above it.)



Figure 60: Re-Installing the Processor Air Duct



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## 6.12 (RK) Re-Installing a Riser Card Assembly

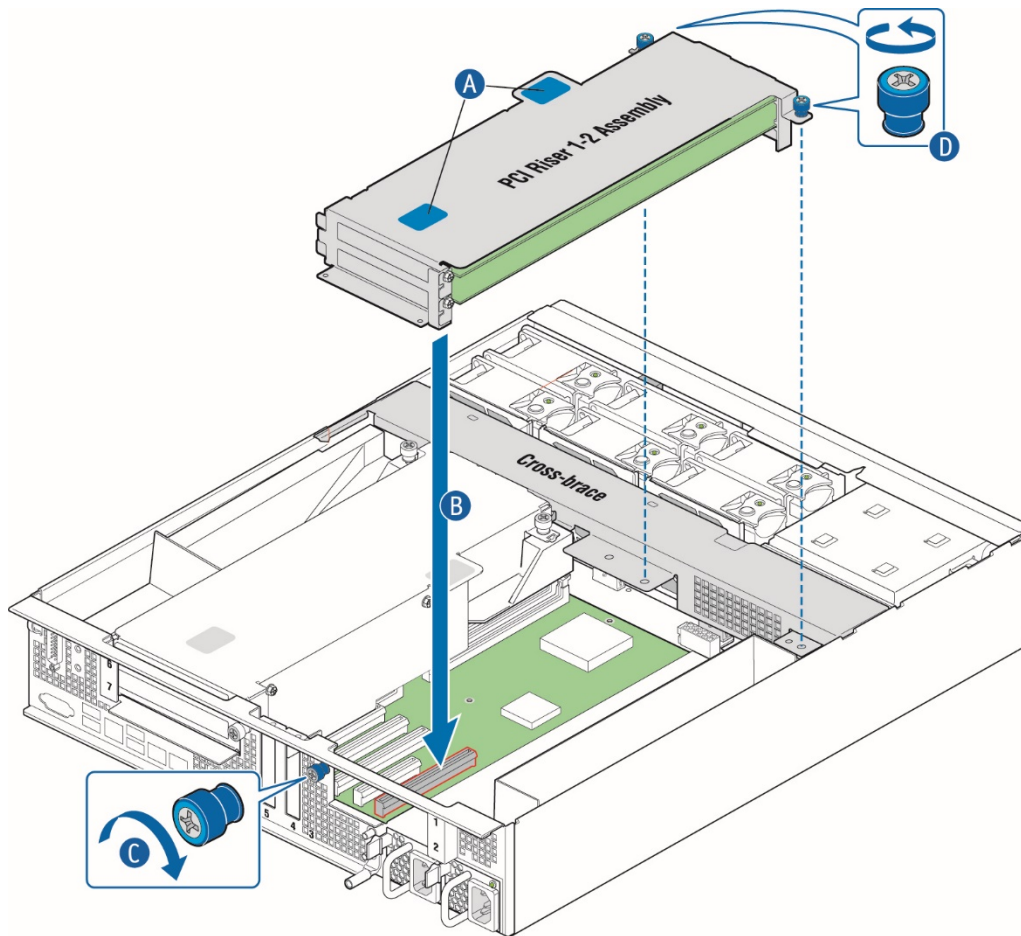
This procedure covers both the right and left riser card assemblies.

### 6.12.1 Re-Installing the Left Riser Card Assembly

To re-install the riser card assembly:

1. Position the riser front tabs over the holes on the PCI support cross bar. (Figure 61).
2. Using the blue touch points on the top of the assembly ("A"), press down to mate the riser card with the header on the server board ("B", slot 2 for the left-side riser)

Figure 61: Re-Installing the Left Riser Card Assembly



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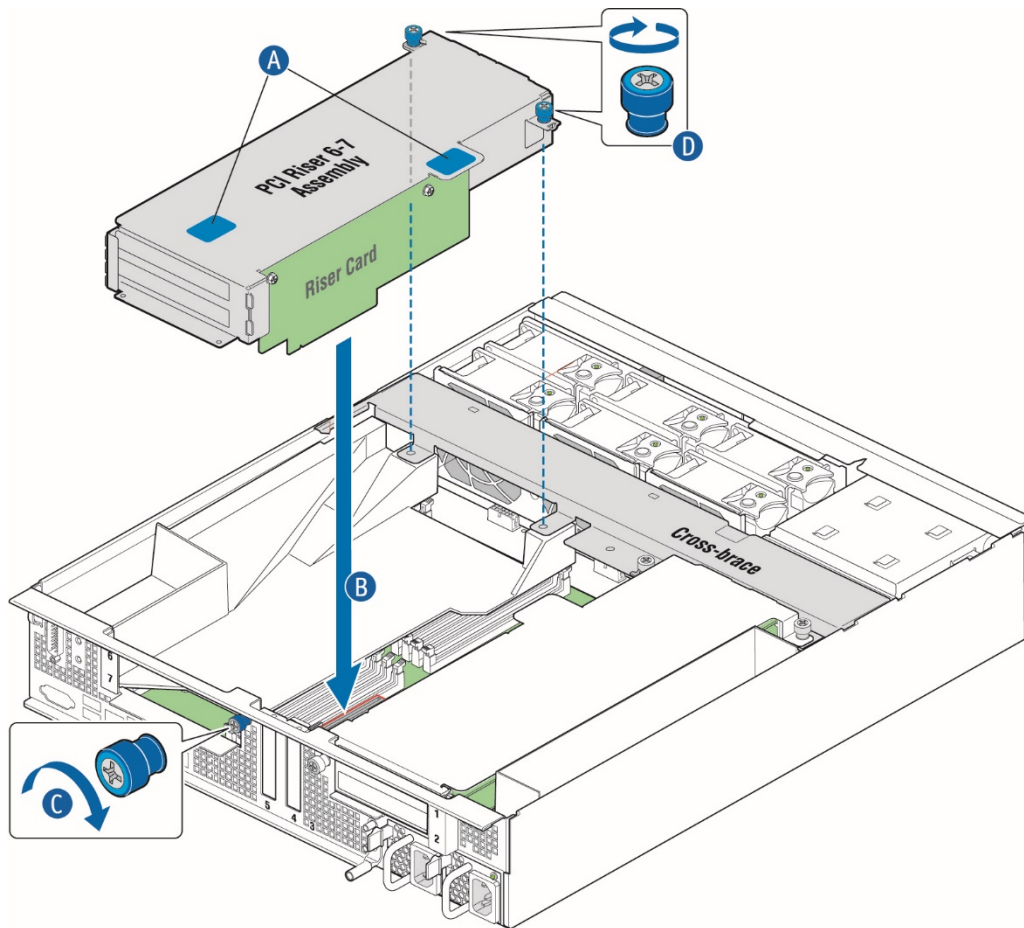
- NOTES:** 1) To avoid damaging the card edge, be sure that the card is lined up straight with the header, not on an angle.  
 2) If a hardware RAID controller card is installed in PCI slot 3, be careful not to damage the diagnostic pins at the back of the card next to the rear chassis panel when re-installing the left-side riser assembly.
3. Align and then tighten the blue captive retention screws at the front of the assembly with the holes on the support cross bar ("C") and on the rear of the chassis. ("D").
  4. Replace the chassis cover. For instructions see (RL) here in Chapter 6.

### 6.12.2 Re-Installing the Right Riser Card Assembly

To re-install the riser card assembly:

1. Position the riser front tabs over the holes on the PCI support cross bar (over the processor air duct). (Figure 62).
2. Using the blue touch points on the top of the assembly ("A"), press down to mate the riser card with the header on the server board ("B", slot 6 for the right-side riser)

Figure 62: Re-Installing the Right Riser Card Assembly



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**NOTE:** To avoid damaging the card edge, be sure that the card is lined up straight with the header, not on an angle.

3. Align and then tighten the blue captive retention screws at the front of the assembly with the holes on the support cross bar ("C") and on the rear of the chassis. ("D").
4. Replace the chassis cover. For instructions see (RL) here in Chapter 6.

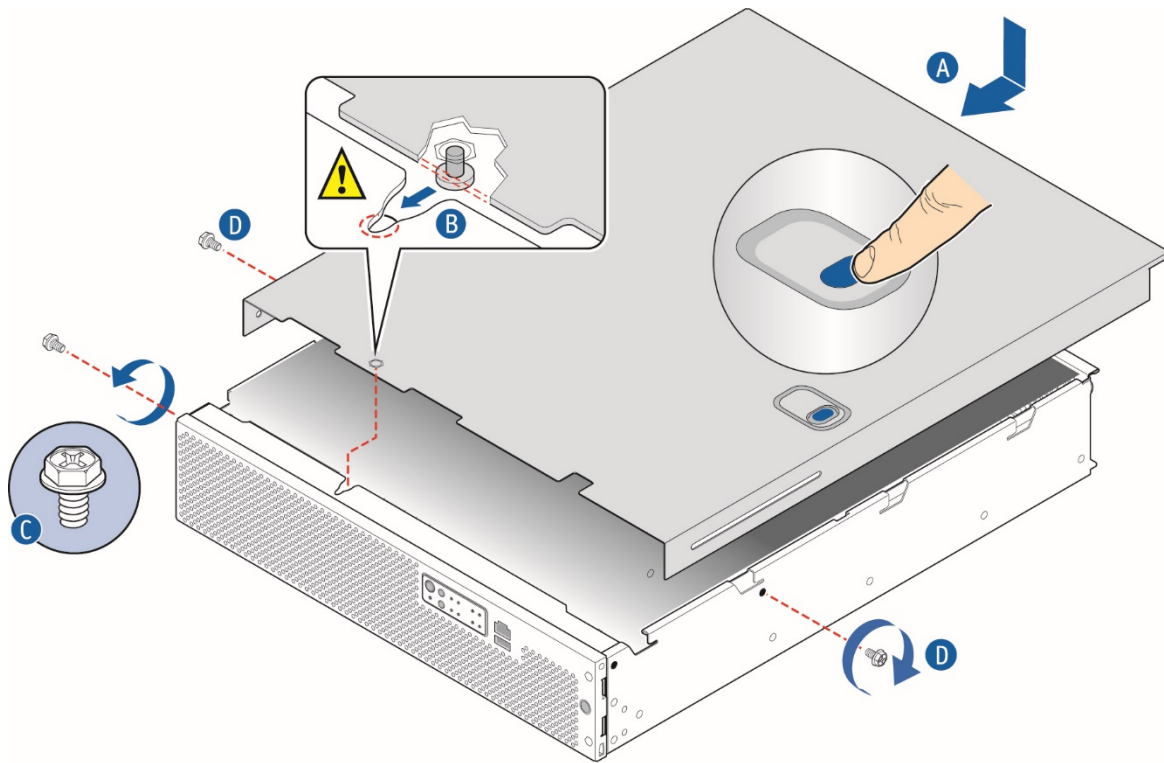
### 6.13 (RL) Re-installing the Chassis Cover

When you are finished working inside the chassis, always put the cover back on before powering on the server again. This step is required to ensure proper cooling.

1. Starting from the rear of the chassis, align the tab on the rear right edge of the cover with the lock bracket on the outside of the rear panel and place the cover down over the chassis with the side edges outside the chassis walls. (Figure 63, "A")

**⚠ CAUTION:** When re-installing the cover, make sure that the guide pin and the notch are aligned ("B") and do not apply excessive force when sliding the cover in place. Misalignment or excessive force may cause damage to the cover's guide pin.

Figure 63: Re-Attaching the Chassis Cover



CG00391A

2. Slide the cover forward until it clicks into place.
3. Install the shipping screw if tooled entry is required or if the unit will be shipped. ("C")
4. Replace the two shoulder screws (one on each side) to fasten the cover to the chassis frame. ("D")
5. Torque screws to 8 lb\*in.
6. Reconnect all peripheral devices and the power cord(s).

**CAUTION:** This unit must have the cover installed when it is running to ensure proper cooling.

## 7 Server Configuration and Utilities

### 7.1 Using the BIOS Setup Utility

This section describes the BIOS Setup utility, which is used to change configuration values for the Kontron CG2300 Carrier Grade Server. The BIOS Setup can be run with or without an operating system present.

#### 7.1.1 Using BIOS Setup

BIOS Setup can be used for the following purposes:

- » Selecting a particular boot device
- » Adjusting settings for the processor, memory, and other devices
- » Configuring RAS, acoustic, and performance settings
- » Setting security and server management options
- » Viewing hardware and system information
- » Restoring settings after replacing the baseboard battery

**NOTE:** Most modern devices do not require manual configuration, so many users will never need to use BIOS Setup.

#### 7.1.2 Starting Setup

After you turn on or reset the server, BIOS prepares the server to boot an operating system. During this time, the following prompt will be displayed:

```
Press <F2> to enter SETUP
```

Pressing **F2** when prompted invokes BIOS setup. The BIOS continues to perform necessary initialization procedures and then displays the BIOS Setup menus.

#### 7.1.3 If You Cannot Access Setup

If you are not able to access BIOS Setup, you may need to restore the BIOS options to their factory settings. For instructions on restoring factory defaults, see Section 8.1 in the *S2600CW Technical Product Specification*.

#### 7.1.4 Setup Menus

Each BIOS Setup menu page has a number of features. Except for features that only display automatically configured information, each feature is associated with a value field with user-selectable parameters. These parameters can be changed if you have adequate security rights. Value fields are inaccessible if the value cannot be changed.

Table 4 describes the keyboard commands available in the BIOS Setup menus.

**Table 4: Keyboard Commands**

Key	Description
<F1>	Help - Pressing F1 on any menu invokes the general Help window.
← →	The left and right arrow keys are used to move between the major menu pages. The keys have no effect if a submenu or pick list is displayed.
↑	Select Item up - The up arrow is used to select the previous value in a menu item's option list, or a value field pick list. Pressing the Enter key activates the selected item.
↓	Select Item down - The down arrow is used to select the next value in a menu item's option list, or a value field pick list. Pressing the Enter key activates the selected item.

Key	Description
F5/-	Change Value - The minus key or the F5 function key is used to change the value of the current item to the previous value. This key scrolls through the values in the associated pick list without displaying the full list.
F6/+	Change Value - The plus key or the F6 function key is used to change the value of the current menu item to the next value. This key scrolls through the values in the associated pick list without displaying the full list. On 106-key Japanese keyboards, the plus key has a different scan code than the plus key on the other keyboard, but it has the same effect.
<Enter>	Execute Command - The Enter key is used to activate submenus when the selected feature is a submenu, or to display a pick list if a selected feature has a value field, or to select a sub-field for multi-valued features like time and date. If a pick list is displayed, the Enter key undoes the pick list and allows another selection in the parent menu.
<Esc>	Exit - The ESC key provides a mechanism for backing out of any field. This key undoes pressing the Enter key. When the ESC key is pressed while editing a field or selecting menu features, the parent menu is re-entered. When the ESC key is pressed in any submenu, the parent menu is re-entered. When the ESC key is pressed in any major menu, the exit confirmation window is displayed and the user is asked whether changes can be discarded.
<F9>	Setup Defaults - Pressing F9 causes the following message to appear:  Setup Confirmation  Load default configuration now?  [Yes] [No]  If Yes is selected and the Enter key is pressed, all Setup fields are set to their default values. If No is selected and the Enter key is pressed, or if the ESC key is pressed, the screen returns to where it was before F9 was pressed without affecting any existing field values.
<F10>	Save and Exit - Pressing F10 causes the following message to appear:  Setup Confirmation  Save Configuration changes and exit now?  [Yes] [No]  If Yes is selected and the Enter key is pressed, all changes are saved and Setup is exited. If No is selected and the Enter key is pressed, or the ESC key is pressed, the screen returns to where it was before F10 was pressed without affecting any existing values.

## 7.2 Single PSU or CPU System - Configuring Sensor Data Repository (SDR)

At factory, CG2300 unit is programmed with two CPUs and two PSUs. This means that the IPMI SDR (Sensor Data Repository) is populated so the system expects two PSUs and two CPUs. Follow the steps below (section 7.2.2) if your system is configured differently in terms of PSU and/or CPU number.

NOTE: DIMM configuration does not require SDR reprogramming.

### 7.2.1 Two (2) Power Supplies + Two (2) Processors Configuration

If the final configuration has two PSUs and two CPUs, factory SDR is ready to use and nothing has to be done on this regard, unless there is a more recent SDR version available. Go to section 7.3 “Upgrading the System Firmware” if you would like to upgrade the SDR version.

### 7.2.2 Non-Redundant Power Unit and/or Single Processor Configuration

If the final system configuration has only one PSU (non-redundant config) and/or CPU (single CPU config), you must reconfigure the system's SDR.

WARNING: System will not be fully healthy if the SDR is not reconfigured, returning some unhealthy indications such as:



- System Fans will stay at max speed at all time;
- Front panel LED will indicate alarms (System Status LED, Alarms LEDs);
- System Event Log will trig some unhealthy events.

This is due to missing components (CPU and/or PSU) that are expected from the factory “default”.

To update your SDR, assemble your system at its final configuration (install CPU, DIMMs and PSU), then follow Upgrade Procedure given at section 7.3.1 below, reconfiguring only the SDR by invoking `updFRUSDR.nsh` script at step 7.

When updating SDR, user must answer a few questions as what are the preferences for:

- Component to update: FRU, SDR or both
  - o **Choose SDR only**
- BMC Telco Alarm Manager: Activated or Deactivated – Factory Default is Activated
  - o **Your preference – suggest same as Factory Default unless otherwise instructed**
- Color LED preference if TAM is Activated – Factory Default is “3 – Default LED Color - All Severities”
  - o **Your preference – suggest same as Factory Default unless otherwise instructed**

Finally, you must disable SDR AutoConfig (not used in the CG2300), by sending two IPMI commands to the BMC:

- `ipmitool raw 0x3e 0x73 0x3`
- `ipmitool mc reset cold`

## 7.3 Upgrading the System Firmware

Please refer to [www.kontron.com](http://www.kontron.com) to download the latest FW versions available for the CG2300.

- Newer versions of FW components were possibly released between the manufacturing process of the chassis and the moment your system got delivered to you.
- You may have been informed by Kontron that your running system would benefit to get the latest FW upgrades.

Consider using new FW loads to optimize your CG2300’s functionality.

Below is the upgrade procedure to follow to perform such upgrade.

### 7.3.1 Upgrade Procedure for FW components

**WARNING:** Do not power off or reset the system while the update is in progress. Do not interrupt the BIOS POST during the first system reboot.

To update the CG2300 server firmware, follow the standard update procedure in the embedded EFI shell.

**NOTE:** Components (e.g., BIOS, BMC, ME, SDR) can be updated individually as shown below, but upgrading the full package is recommended to avoid possibly running incompatible firmware components.

The update package is available at [www.kontron.com/](http://www.kontron.com/) (search for CG2300, click on DOWNLOAD: CG2300 Software Update Package)

1. Uncompress the update package and copy the contents to a USB flash drive.
2. Insert the USB flash drive into any of the USB ports on the system.
3. Power up the system and boot the EFI shell. (Press F6 and select “EFI”)
4. Run the command “`map-r`” in the EFI shell to mount the USB flash drive.
5. Run the command “`fs0`” to change the active device to the USB flash drive.  
The USB key can also be mounted to “`fs1`”. The `fs#` depends on the results from the “`map-r`” command.
6. Change the directory to the folder that stores the firmware package. (e.g., `cd NewFW-CG2300`)
7. Type in “`updALL.nsh`” at the shell prompt to initiate updating the BIOS and all firmware. (See steps below for updating single components instead.)
8. When prompted for the FRUSDR update, select the either the option to update only the SDR or the option to update both the FRU and SDR.
9. Answer the rest of the FRUSDR prompts as you want.



10. Provide input to the additional prompts. (Updating each specific FRU area is optional; “Yes” or “No”)
11. When the FRU update is complete, the system returns to the EFI shell prompt.  
Type “Reset” to reset the system.  
The system takes three minutes or so to reboot so it can actually update the firmware. Do not interfere with this process.
12. During POST, press <F2> to enter the BIOS setup.
13. In the BIOS Setup screens, verify that the BIOS, ME, BMC, and FRUSDR revisions were loaded.
14. Press <F10> and answer “yes” to load the BIOS setup defaults.
15. Configure the BIOS settings you want.
16. Save the settings and reboot the system.

To update single components (e.g., BIOS, BMC, ME, SDR), instead of “updALL.nsh”, at step 7 in the procedure above, use the appropriate script, corresponding to the component to update:

BIOS: updBIOS.nsh

BMC: updBMC.nsh

ME: updME.nsh

**NOTE:** In the unlikely event that a BIOS error occurs during the BIOS update process, a recovery process may need to be followed to return the system to service. See Section 1.4, “Additional Information and Software” for additional information.

## 7.4 BIOS Default and Password Reset Usage Procedure

The BIOS Default and Password Reset recovery features are designed so the desired operation can be achieved with minimal system downtime. The usage procedure for these two features has changed from previous generation Intel® Server Boards. The following procedure outlines the new usage model.

The server boards have several 3-pin jumper blocks that can be used to configure, protect, or recover specific features of the server boards.

### 7.4.1 Set BIOS to Default (Clearing the CMOS)

To clear the CMOS, perform the following steps:

1. Power down the server. Unplug the power cord.
2. Open the server chassis. For instructions, see (A) in Chapter 4.
3. Move the jumper from the default operating position (covering pins 1 and 2) to the reset/clear position (covering pins 2 and 3).
4. Wait five seconds.
5. Move the jumper back to the default position (covering pins 1 and 2).
6. Close the server chassis. For instructions, see (RL) in Chapter 6.
7. Connect the AC power cord.
8. Power up the server and access the BIOS setup utility by pressing <F2>.
9. Verify that the BIOS default operation was successful by viewing the Error Manager screen.  
Two errors should be logged:

```
5220 BIOS Settings reset to default settings
```

```
0012 System RTC date/time not set
```

The CMOS is now cleared and can be reset by going into the BIOS setup.

**NOTE:** This jumper does not reset Administrator or User passwords. To reset passwords, the Password Clear jumper must be used. The system will automatically power on after AC is applied.

## 7.4.2 Clearing the Password

This jumper causes both the User password and the Administrator password to be cleared if they were set. The operator should be aware that this creates a security gap until passwords have been installed again through the <F2> BIOS Setup utility. This is the only method by which the Administrator and User passwords can be cleared unconditionally. Other than this jumper, passwords can only be set or cleared by changing them explicitly in BIOS Setup or by similar means. No method of resetting BIOS configuration settings to default values will affect either the Administrator or User passwords.

To clear the password, perform the following steps:

1. Power down the server. For safety, unplug the power cord(s).
2. Remove the system top cover.
3. Move the “*Password Clear*” jumper from the default operating position (covering pins 1 and 2) to the password clear position (covering pins 2 and 3).
4. Re-attach the system top cover and plug in the power cord(s).
5. Power up the server and access the <F2> BIOS Setup utility.
6. Verify the password clear operation was successful by viewing the Error Manager screen.
7. Two errors should be logged:
 

```
5221 Passwords cleared by jumper
5224 Password clear jumper is set
```
8. Exit the BIOS Setup utility and power down the server. For safety, unplug the AC power cords.
9. Remove the system top cover and move the “*Password Clear*” jumper back to the default operating position (covering pins 1 and 2).
10. Re-attach the system top cover and plug in the AC power cord(s).
11. Power up the server.
12. The password is now cleared and can be reset by going into the BIOS setup.

## 7.5 Integrated BMC Force Update Procedure

When performing the standard Integrated BMC firmware update procedure, the update utility places the Integrated BMC into an update mode, allowing the firmware to load safely onto the flash device. In the unlikely event the Integrated BMC firmware update process fails due to the Integrated BMC not being in the proper update state, the server board provides an Integrated BMC Force Update jumper that forces the Integrated BMC into the proper update state.

The following procedure should be completed in the event the standard Integrated BMC firmware update process fails.

1. Power down and remove the AC power cord.
2. Open the server chassis. For instructions, see (A) in Chapter 6.
3. Move the jumper from the default operating position (covering pins 1 and 2) to the enabled position (covering pins 2 and 3).
4. Close the server chassis.
5. Reconnect the AC cord and power up the server.
6. Perform the Integrated BMC firmware update procedure as documented in the README.TXT file that is included in the Integrated BMC firmware update package.

After successful completion of the firmware update process, the firmware update utility may generate an error stating that the Integrated BMC is still in update mode.

7. Power down and unplug the AC power cord(s).

8. Open the server chassis.
9. Move the jumper from the enabled position (covering pins 2 and 3) to the disabled position (covering pins 1 and 2).
10. Close the server chassis.
11. Re-connect the AC cord(s) and power up the server.

**NOTE:** Normal Integrated BMC functionality is disabled with the Force Integrated BMC Update jumper set to the enabled position. The server should never be run with the Integrated BMC Force Update jumper set in this position. This jumper setting should only be used when the standard firmware update process fails. This jumper should remain in the default/disabled position when the server is running normally.

## 7.6 ME Force Update Jumper

When the ME Firmware Force Update jumper is moved from its default position, the ME is forced to operate in a reduced minimal operating capacity. This jumper should only be used if the ME firmware has become corrupted and requires re-installation.

The following procedure should be followed.

1. Power down and remove the AC power cord(s).
2. Open the server chassis. For instructions, see (A) in Chapter 6.
3. Move the jumper from the default operating position (covering pins 1 and 2) to the enabled position (covering pins 2 and 3).
4. Close the server chassis.
5. Re-connect the AC cord(s) and power up the server.
6. Boot to the EFI shell and update the ME firmware using the “MEComplete.cap” file with the following command:  

```
iflash32 /u /ni MEComplete.cap
```
7. Power down and unplug the AC power cord(s).
8. Open the server chassis.
9. Move the jumper from the enabled position (covering pins 2 and 3) to the disabled position (covering pins 1 and 2).
10. Close the server chassis.
11. Reconnect the AC cord(s) and power up the server.

## 7.7 BIOS Recovery Jumper

When the BIOS Recovery jumper block is moved from its default pin position (pins 1-2), the system will boot to the uEFI shell, where a standard BIOS update can be performed. See the BIOS update instructions that are included with System Update Packages (SUP) downloaded from Intel’s download center web site. This jumper is used when the system BIOS has become corrupted and is non-functional, requiring a new BIOS image to be loaded on to the server board.

The following procedure should be followed:

1. Turn off the system.
2. For safety, remove the AC power cord(s).
3. Remove the system top cover.

4. Move the “*BIOS Recovery*” jumper from the default operating position (covering pins 1 and 2) to the BIOS Recovery position (covering pins 2 and 3).
5. Reinstall the system top cover and reattach the AC power cord(s).
6. Power up the system.
7. The system will automatically boot to the EFI shell. Update the BIOS using the standard BIOS update instructions provided with the system update package.
8. After the BIOS update has successfully completed, power off the system. For safety, unplug the AC power cord(s) from the system.
9. Remove the system top cover.
10. Move the “*BIOS Recovery*” jumper back to the default operating position (covering pins 1 and 2).
11. Re-attach the system top cover and plug in the AC power cord(s).
12. Power up the system and access the <F2> BIOS Setup utility.
13. Configure the desired BIOS settings.
14. Press the <F10> key to save and exit the utility.

## 7.8 Restoring BIOS Default Settings

If you are not able to access the BIOS setup screens, you may need to restore the BIOS settings to their factory defaults by clearing the CMOS. This procedure requires physical access to the inside of the server.

1. Power down the system but do not disconnect the power cord(s).
2. Open the server. See (A) in Chapter 4 for instructions.
3. Remove the right-side, slot 5 riser assembly. For instructions, see “(B) Removing a Riser Card Assembly”.
4. Remove the processor air duct. For instructions, see “(C) Removing the Processor Air Duct”.
5. Locate the “BIOS Default” jumper (J2J2) as shown in Figure 29.
6. Move jumper (J2J2) from the normal position covering pins 1-2 to the reset/clear position covering pins 2-3.
7. Wait five seconds and remove power.
8. Move the jumper (J2J2) back to the normal default position (pins 1-2).
9. Re-install the processor air duct and the right-side riser card assembly.
10. Close the server chassis. See (RL) in Chapter 6 for instructions.
11. Power up the server.

The CMOS is now cleared and can be reset by going into the BIOS setup.

**NOTE:** Removing power before performing the CMOS clear operation causes the system to automatically power up and immediately power down after the procedure is followed and power is re-applied. If this happens, remove the power cord again, wait 30 seconds, and reconnect the power cord. Then, power up the system and proceed to the <F2> BIOS Setup utility to reset the settings.

## 8 Troubleshooting

This chapter assists with identifying and solving problems that might occur while using the Kontron CG2300 Carrier Grade Server.

For any issue, first ensure you are using the latest firmware and files. Firmware upgrades include updates for BIOS and the baseboard management controller (BMC). Go to <http://www.kontron.com/products/systems/telecom-systems/cg2300-carrier-grade-rackmount-server.html>, click on downloads, BIOS for information about the latest updates. In addition to the server firmware and files, also update any drivers used for components installed in the system, such as video drivers, network drivers, and SAS drivers.

If these steps do not help resolve the server problems, see Appendix D: Getting Help” for assistance.

### 8.1 CPU Socket Inspection

The following socket pin inspection procedure, which is used by Kontron contract manufacturers, was developed by Kontron manufacturing engineers, based on CPU socket designer guidelines. Kontron recommends that all users perform a socket inspection before adding or replacing a CPU in the CG2300 server. These inspection steps may also be helpful for other debugging purposes as well.

**NOTE:** There are two levels of inspection in this procedure and three different criteria for rejecting a socket. Before returning the CG2300 system to Kontron for RMA based on bent pins, be sure the socket you are examining meets the two-level rejection criteria in these instructions.

#### 8.1.1 First Level Inspection

Visually inspect the socket contact array as follows:

1. Hold the socket load plate open and get within 6 to 12 inches of the socket on the server board.
2. Using a magnification task light, scan the socket contacts while tilting the light away from the socket 15 to 45 degrees and rotating your gaze 15 to 45 degrees from perpendicular to change your viewing angle three times.

#### Rejection Criteria

If the socket fails one of the following criteria, go on to the second level inspection before concluding there are bent pins.

- » Any contact that does not reflect light back at all while the rest of the contacts around it do
- » Any contact that reflects light earlier or later than the rest
- » Any foreign material in sufficient quantities to be detectable with un-aided vision

#### 8.1.2 Second Level Inspection

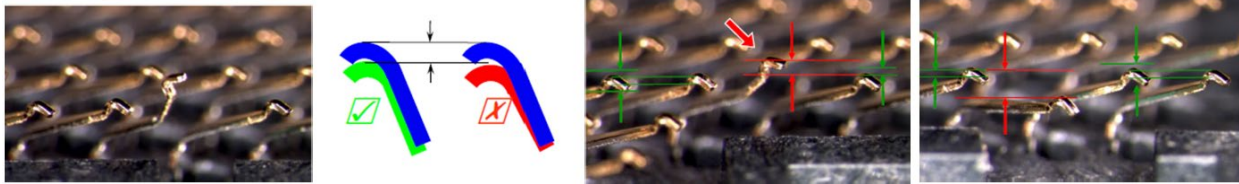
If an alignment problem is found, confirm the defect under a microscope.

1. A contact is bent backwards upon itself or has shifted up or down from the normal position

#### Rejection Criteria

- » Contact tips do not lie within +/- one contact thickness from the plane defined by call contact tips as shown in Figure 64.

Figure 64: Bent Pin Example

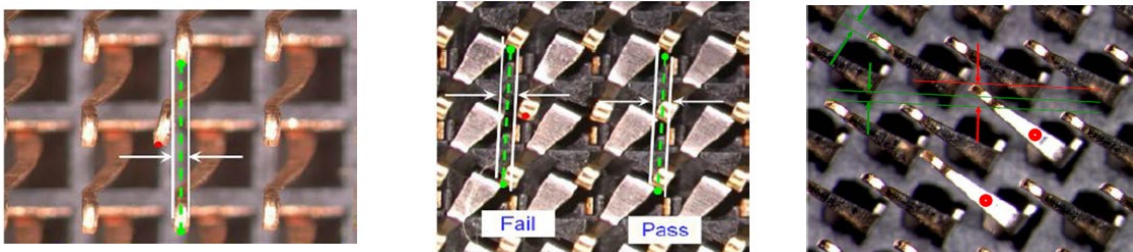


2. A contact is shifted sideways

### Rejection Criteria

- » Contact tips are not aligned within  $\pm 1$  contact width of the suspect contact tip as shown in Figure Figure 65.

Figure 65: Contact Shifted Sideways Example



**NOTE:** Red circles indicate failed contacts.

If the socket fails criteria in both inspection levels, it is defective. Possible actions are:

- » Return the server board directly to Intel (high volume system integrators)  
or
- » RMA the whole CG2300 server to Kontron (low volume users)  
Contact Technical Support to get an RMA number and specify that the issue was found in Section 8.1, “CPU Socket Inspection” in the *CG2300 Server Installation and Maintenance Guide*.

## 8.2 Resetting the System

Before going through in-depth troubleshooting, first attempt to reset the system using one of these methods:

To do this:	Press:
Soft boot reset to clear the system memory and reload the operating system	<Ctrl+Alt+Del>
Clear system memory, restart POST, and reload the operating system	Reset button
Cold boot reset. Turn the system power off and then on. This clears system memory, restarts POST, reloads the operating system, and halts power to all peripherals	Power on/off

## 8.3 Problems Following Initial System Installation

Problems that occur at initial system startup are usually caused by an incorrect installation or configuration. Hardware failure is a less frequent cause. If the problem you are experiencing is with a specific software application, see “Problems with Newly Installed Application Software”.

### 8.3.1 First Steps Checklist

- » Is power available at the source?
- » Are the power supplies plugged in? Check the power cable on the back of the server and at the power source.
- » Is the system power cord properly connected to the system? For AC-powered systems, is the power cord plugged into a NEMA (National Electrical Manufacturing Association) 5-15R outlet for 100-120V or a NEMA 6-15R outlet for 200-240V
- » Are all cables correctly connected and secured?
- » Are the processors fully seated in their sockets on the server board?
- » Are all standoffs in the proper location and not touching any components, causing a potential short?
- » Are all PCI Express\* (PCIe\*) add-in cards fully seated in their slots in the respective riser cards?
- » Are all jumper settings on the server board correct?
- » Are all jumper and switch settings on add-in boards and peripheral devices correct?
- » To check these settings, refer to the manufacturer's documentation that comes with them. If applicable, ensure that there are no conflicts-for example, two add-in boards sharing the same interrupt.
- » Are all peripheral devices installed correctly?
- » Are the hard disk drives (up to 6) properly formatted or configured?
- » Are all device drivers properly installed?
- » Are the configuration settings made in Setup correct?
- » Is the operating system properly loaded? Refer to the operating system documentation.
- » Was the system power on/off switch on the front panel pressed to turn the server on (power on light should be lit)?
- » Are all integrated components from the tested components lists? Check the tested memory list and the supported hardware and operating system list. Go to <http://www.kontron.com/products/systems/telecom-systems/cg2300-carrier-grade-rackmount-server.html> for links to the tested component lists.

## 8.4 Hardware Diagnostic Testing

This section provides a more detailed approach to identifying a hardware problem and locating its source.

**CAUTION:** Turn off devices before disconnecting cables.

Before disconnecting any peripheral cables from the system, turn off the system and any external peripheral devices. Failure to do so can cause permanent damage to the system and/or the peripheral devices.

1. Turn off the system and all external peripheral devices. Disconnect each of devices from the system, except for the keyboard and the video monitor.
2. Make sure the system power cord is plugged into a properly grounded AC outlet.
3. Make sure the video display monitor and keyboard are correctly connected to the system. Turn on the video monitor. Set its brightness and contrast controls to at least two thirds of their maximum ranges. (See the documentation supplied with the video display monitor).
4. Turn on the system. If the power LED does not light, see Section 7.4.1, "Power Light does not Light".

### 8.4.1 Verifying Proper Operation of Key System Lights

As POST determines the system configuration, it tests for the presence of each mass storage device installed in the system. As each device is checked, its activity light should turn on briefly. Check for the following:



- » If system LEDs are illuminated, see Section 7.5, “LED Information” for a description of the LED lights and steps that need to be taken to correct the problem.

### 8.4.2 Confirming the Operating System Load

Once the system boots up, the operating system prompt appears on the screen. The prompt varies according to the operating system. If the operating system prompt does not appear, see “No Characters Appear on Screen”.

## 8.5 Specific Problems and Corrective Actions

This section provides possible solutions for specific problems:

Try the solutions below in the order given. If the problem cannot be corrected, contact your service representative or authorized dealer for help. See “Appendix D: Getting Help” for contact details.

### 8.5.1 Power Light does not Light

Check the following:

- » Was the power-on button pressed?
- » Is the system operating normally? If so, the power LED might be defective or the cable from the front panel to the server board might be loose.
- » Is the server power cord securely plugged into the power supply?
- » For AC, will other items plugged into the same power outlet function correctly?
- » Remove all add-in cards and see if the system boots. If successful, re-insert the cards one at a time with a reboot between each addition.
- » Make sure the memory DIMMs comply with the system requirements.
- » Make sure the memory DIMMs have been populated according to the system requirements.
- » Remove the memory DIMMs and re-seat them.
- » Make sure the processor complies with the system requirements.
- » Remove the processor and re-seat it.

### 8.5.2 No Characters Appear on Screen

Check the following:

- » Is the keyboard functioning? Test it by turning the “Num Lock” function on and off to make sure the Num Lock light is functioning.
- » Is the video monitor plugged in and turned on? If you are using a switch box, is it switched to the correct system?
- » Are the brightness and contrast controls on the video monitor properly adjusted?
- » Is the video monitor signal cable properly installed?
- » Does this video monitor work correctly if plugged into a different system?
- » Is the onboard video controller enabled in the BIOS?
- » Remove all add-in cards and see if the video returns. If successful, re-insert the cards one at a time with a reboot between each addition.
- » Make sure the memory DIMMs comply with the system requirements.
- » Make sure the memory DIMMs have been populated according to the system requirements.

- » Remove the memory DIMMs and re-seat them.
- » Make sure the processor complies with the system requirements.
- » Remove the processor and re-seat it.

### 8.5.3 Characters are Distorted or Incorrect

Check the following:

- » Are the brightness and contrast controls properly adjusted on the video monitor?  
See the manufacturer's documentation.
- » Are the video monitor's signal and power cables properly installed?
- » Does this video monitor work correctly if plugged into a different system?

### 8.5.4 System Cooling Fans do not Rotate Properly

If the system cooling fans are not operating properly, it is an indication of possible system component failure.

Check the following:

- » Is the power-on light lit? If not, see Section 7.4.1, "Power Light does not Light".
- » Are any other front panel LEDs lit?
- » Have any of the fan motors stopped? Use the server management subsystem to check the fan status.
- » Have the fans sped up in response to an overheating situation?
- » Have the fans sped up in response to a fan that has failed?
- » Are the fan power connectors properly connected to the front panel (FP) board?
- » Is the cable from the front panel board connected to the both the front panel board and to the server board?
- » Are the power supply cables properly connected to the FP board?
- » Are there any shorted wires caused by pinched-cables or have power connector plugs been forced into power connector sockets the wrong way?

### 8.5.5 Cannot Connect to a Server

- » Make sure the network cable is securely attached to the correct connector at the system back panel.
- » Try a different network cable.
- » Make sure the correct and the current drivers are being used. Go to <http://www.kontron.com/products/systems/telecom-systems/cg2300-carrier-grade-rackmount-server.html> for a link to the drivers.
- » Make sure the driver is loaded and the protocols are bound.
- » Make sure the hub port is configured for the same duplex mode as the network controller.
- » Make sure the correct networking software is installed.  
If you are directly connecting two servers (without a hub), you will need a crossover cable.

### 8.5.6 Diagnostics Pass but the Connection Fails

- » Make sure the network cable is securely attached.

- » Make sure to specify the correct frame type in the NET.CFG file.

### 8.5.7 The (NIC) Controller Stopped Working When an Add-in Adapter was Installed

- » Make sure the cable is connected to the port from the onboard network controller.
- » Make sure the BIOS is current. Go to <http://www.kontron.com/products/systems/telecom-systems/cg2300-carrier-grade-rackmount-server.html> for a link to the current version.
- » Try reseating the add-in adapter.

### 8.5.8 The Add-in Adapter Stopped Working without Apparent Cause

- » Try reseating the adapter first; then try a different slot if necessary.
- » The network driver files may be corrupt or deleted. Delete and then reinstall the drivers.
- » Run the diagnostics.

### 8.5.9 System Boots When Installing a PCI Card

System Server Management features require full-time “standby” power. This means some parts of the system have power going to them whenever the power cord is plugged in, even if the system power is turned off with the power button on the front panel. If you install a PCI card with the power cord plugged in, a signal may be sent to command the system to boot. Before installing a PCI card, always:

1. Turn off the server power by using the power button on the front of the system.
2. Unplug the power cord(s) from the server.

### 8.5.10 Problems with Newly Installed Application Software

Problems that occur when you run new application software are usually related to the software, not the server hardware. Faulty equipment is unlikely, especially if other software runs correctly.

Check the following:

- » Make sure the system meets the minimum hardware requirements for the software. See the software documentation.
- » Make sure the software is properly installed and configured for the system. See the software documentation.
- » Use only an authorized copy. Unauthorized copies often do not work.
- » Make sure the correct device drivers installed.

If the problems persist, contact the software vendor’s customer service representative.

### 8.5.11 Problems with Application Software that Ran Correctly Earlier

Problems that occur after the system hardware and software have been running correctly sometimes indicate equipment failure. However, they can also be caused by file corruption or changes to the software configuration.

Check the following:

- » Uninstall and reinstall the software. Make sure all necessary files are installed.
- » If the problems are intermittent, there may be a loose cable, dirt in the keyboard (if keyboard input is incorrect), a marginal power supply, or other random component failures.

- » If you suspect that a transient voltage spike, power outage, or brownout might have occurred, reload the software and try running it again. Symptoms of voltage spikes include a flickering video display, unexpected system reboots, and the system not responding to user commands.

**NOTE:** For AC power, if you are getting random errors in data files, they may be getting corrupted by voltage spikes on the power line. If you are experiencing any of the above symptoms that might indicate voltage spikes on the power line, it may help to install a surge suppressor between the power outlet and the system power cord.

### 8.5.12 Devices are not Recognized under Device Manager (Windows\*OS)

The Windows\* operating systems do not include all of the drivers for the Intel® chipsets, onboard NICs, and other components. Check the Kontron Deployment CD that came with the server or go to <http://www.kontron.com/products/systems/telecom-systems/cg2300-carrier-grade-rackmount-server.html> for a link to the current drivers and chipset files.

### 8.5.13 Hard Drive(s) are not Recognized

Check the following:

- » Make sure the drive is not disabled in BIOS Setup.
- » Make sure the drive is compatible. Go to <http://www.kontron.com/products/systems/telecom-systems/cg2300-carrier-grade-rackmount-server.html> for a link to the list tested drives.
- » Make sure the power budget for the server has not been exceeded. Go to <http://www.kontron.com/products/systems/telecom-systems/cg2300-carrier-grade-rackmount-server.html> for a link to software to check the power budget.

### 8.5.14 SD card is not Recognized under UEFI shell

In UEFI environment:

SD card's slots are connected to motherboard's USB controller through a USB hub which presents a detection limitation, under UEFI environment.

If you are under UEFI shell and you connect a SD card into the system, the SD card will not get detected unless you run "map -r" command.

On the opposite, since directly attached to the motherboard's USB controller, USB devices should be detected directly when connected.

In any problematic case related to detection of SD card or USB devices, make sure the USB controller is not disabled in BIOS Setup.

### 8.5.15 Some BIOS settings cannot be detected/modified through Syscfg tool (Intel) under UEFI shell

The "biossettings" command of syscfg tool is an advanced option to display the BIOS settings, achieving this by parsing specific BIOS table(s). When running syscfg tool under UEFI shell, you may get a different behavior depending if you got into UEFI using the F6 (Boot Menu) or F2 (BIOS Menu and then selecting Booting UEFI shell).

When hotkey F2 is pressed, some procedures for updating BIOS table(s) will be proceed (e.g. boot device info). Then the BIOS settings can be found by the "biossettings" command of syscfg tool. These procedures will not be proceed when using hotkey F6, so "biossettings" command of syscfg tool will not permit to detect/modify the desired BIOS settings (in this case, command response is "BIOS variable not found").

Simply restart the system and get to UEFI using F2 hotkey, getting into BIOS menu, then choosing UEFI shell in the Boot Device list.

## 8.6 Light-Guided Diagnostics

The server board includes several on-board LED indicators to aid with troubleshooting various board-level faults. This section describes the function of each LED on the server board. For more information and the location of each LED on the board, see the Intel® Server Board S2600 Family TPS on the Kontron website .

### 8.6.1 5 Volt Stand-by LED

Several server management features on the S2600CW2SK server board require a 5V stand-by voltage supplied from the power supply. The features and components that require this voltage must be present when the server is powered down. The LED is illuminated when power is applied to the platform and 5V stand-by voltage is supplied to the server board by the power supply. This LED is located just below the internal USB connector.

### 8.6.2 DIMM Fault LEDs

The server board provides a memory fault LED for each DIMM socket. These LEDs are located at the top left side of each CPU 2 DIMM slot (E, F, G, H) and at the top right side of each CPU 1 DIMM slot (A, B, C, D). A DIMM fault LED lights if the corresponding DIMM slot has memory installed and a memory error occurs.

### 8.6.3 System ID LED, System Status LED, and POST Code Diagnostic LED

These LEDs are located at the rear of the S2600CW2SK server board, to the left of the I/O ports.

#### System ID LED

To light the System ID LED, use one of the following two methods:

1. Press the System ID button on the front control panel of the chassis. The ID LED displays as solid white on the front panel and solid blue on the rear of the server until the button is pressed again.
2. Issue the appropriate hex IPMI “Chassis Identify” value. The ID LED will either blink for 15 seconds and turn off or will blink indefinitely until the hex IPMI “Chassis Identify” value is re-issued to turn it off.

#### System Status LED

The bicolor (green/amber) System Status LED

Table 5: System Status LED Definitions

Color	State	Criticality	Description
Green	Solid on	System OK	System booted and ready
Green	Blink	Degraded	<p>System degraded:</p> <ul style="list-style-type: none"> <li>• Non-critical temperature threshold asserted</li> <li>• Non-critical voltage threshold asserted</li> <li>• Non-critical fan threshold asserted</li> <li>• Fan redundancy lost, sufficient system cooling maintained. This does not apply to non-redundant systems.</li> <li>• Power supply predictive failure</li> <li>• Power supply redundancy lost. This does not apply to non-redundant systems.</li> <li>• Corrective errors over a threshold of 10 and migrating to a mirrored DIMM (memory mirroring). This indicates the user no longer has spare DIMMs indicating a redundancy lost condition. The corresponding DIMM LED should light up</li> </ul>
Amber	Blink	Non-critical	<p>Non-fatal alarm – system is likely to fail:</p> <ul style="list-style-type: none"> <li>• Critical temperature threshold asserted</li> <li>• CATERR asserted</li> <li>• Critical voltage threshold asserted</li> <li>• VRD not asserted</li> <li>• SMI timeout asserted</li> </ul>
Amber	Solid on	Critical, non-recoverable	<p>Fatal alarm – system has failed or shut down</p> <ul style="list-style-type: none"> <li>• CPU missing</li> <li>• Thermal Trip asserted</li> <li>• Non-recoverable temperature threshold asserted</li> <li>• Non-recoverable voltage threshold asserted</li> <li>• Power fault/power control failure</li> <li>• Fan redundancy lost, insufficient system cooling. This does not apply to non-redundant systems.</li> <li>• Power supply redundancy lost, insufficient system power. This does not apply to non-redundant systems.</li> </ul> <p>(NOTE: This state also occurs when power is first applied to the system. This indicates the BMC is booting)</p>
Off	N/A	Not ready	<p>Power off, if no degraded, non-critical, critical, or non-recoverable conditions exist.</p> <ul style="list-style-type: none"> <li>•</li> </ul>

## Post Code Diagnostic LEDs

During the system boot process, the BIOS executes a number of platform configuration processes, each of which is assigned a specific hex POST code number. As each configuration routine is started, the BIOS displays the given POST code to the POST code diagnostic LEDs on the back edge of the server board. To assist in troubleshooting a system failure during the POST process, use the diagnostic LEDs to identify the last POST process executed.

### 8.6.4 POST Error Beep Codes

Table 6 lists the POST error beep codes. Prior to system video initialization, the BIOS uses these beep codes to inform users of error conditions. Please note that not all error conditions are supported by BIOS beep codes.

**Table 6: POST Error Beep Codes**

Beeps	Error Message	Post Progress Code	Description
1	USB device action	N/A	Short beep sounded whenever a USB device is discovered in POST or inserted or removed during runtime
1	Intel® TXT security violation	0xAE, 0xAF	System halted because the Intel® Trusted Execution Technology detected a potential violation of system security
3	Memory error	Multiple	System halted because a fatal error related to the memory was detected
The following Beep Codes are sounded during BIOS recovery			
2	BIOS Recovery started	N/A	Recovery boot has been initiated
4	BIOS Recovery failure	N/A	BIOS recovery has failed. This typically happens so quickly after recovery is initiated that it sounds like a 2 – 4 beep code.

The Integrated BMC may generate beep codes upon detection of failure conditions. Beep codes are sounded each time 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 the 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 7: Integrated BMC Beep Codes**

Beep Code	Reason for Beep	Associated Sensors
1-5-2-1	CPU socket population error	CPU1 socket is empty or sockets are populated incorrectly CPU1 must be populated before CPU2
1-5-2-4	MSID mismatch	MSID mismatch occurs if a processor is installed into a system board that has incompatible power capabilities
1-5-4-2	Power fault	DC power unexpectedly lost (power good dropout) Power unit sensors report power unit failure offset
1-5-4-4	Power control fault	Power good assertion timeout Power unit sensors report soft power control failure offset
1-5-1-2	VR watchdog timer	VR controller DC power on sequence was not completed in time
1-5-1-4	Power supply status	The system does not power on or unexpectedly powers off and a Power Supply Unit (PSU) is present that is an incompatible model with the other PSU in the system.



## 9 Appendix A: Safety Information

**WARNING:** Although you may be using this guide or another resource as a reference, before working with your server product pay close attention to these safety instructions. Always 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 non-compliance with product regulations in the region(s) in which the product is sold.

### 9.1 Emissions Disclaimer

To ensure EMC (Electromagnetic Compatibility) compliance with your local regional rules and regulations, the final configuration of your end system product may require additional EMC compliance testing. For more information, please contact your local Kontron Representative. See Appendix B, "Regulatory and Certification Information" for product Safety and EMC regulatory compliance information. This is an FCC (Federal Communications Commission) Class A device.

### 9.2 Intended Uses

This product was evaluated as Information Technology Equipment (ITE), which may be installed in Central Offices, Telecommunication Centers, offices, schools, computer rooms, and similar commercial type locations. The suitability of this product for other product categories and environments (medical, industrial, telecommunications, residential, alarm systems, test equipment, etc.), other than an ITE application, may require further evaluation.

**WARNING:** Anchor the equipment rack: The equipment rack must be anchored to an unmovable support to prevent it from falling over when one or more servers are extended in front of the rack on slides. Always also consider the weight of any other device installed in the rack. A crush hazard exists should the rack tilt forward which could cause serious injury.

#### 9.2.1 If AC power supplies are installed:

**Mains AC power disconnect:** The AC power cord(s) is considered the mains disconnect for the server and must be readily accessible when installed. If the individual server power cord(s) will not be readily accessible for disconnection then you must install an AC power disconnect for the entire rack unit. This main disconnect must be readily accessible, and it must be labeled as controlling power to the entire rack, not just to the server(s).

**Grounding the rack installation:** To avoid the potential for an electrical shock hazard, you must include a third wire safety ground conductor with the rack installation. If the server power cord is plugged into an AC outlet that is part of the rack, then you must provide proper grounding for the rack itself. If the server power cord is plugged wall AC outlet, the safety ground conductor in the power cord provides proper grounding only for the server. You must provide additional, proper grounding for the rack and other devices installed in it.

**Overcurrent protection:** The server is designed for an AC line voltage source with up to 20 amperes of overcurrent protection per cord feed. If the power system for the equipment rack is installed on a branch circuit with more than 20 amperes of protection, you must provide supplemental protection for the server. The overall current rating of a configured server is less than 6 amperes.

**WARNING:** Do not attempt to modify or use an AC power cord set that is not the exact type required. You must use a power cord set that meets the following criteria:

**Rating:** In the U.S. and Canada, cords must be UL (Underwriters Laboratories, Inc.) Listed/CSA (Canadian Standards Association) Certified type SJT, 18-3 AWG (American Wire Gauge). Outside of the U.S. and Canada, cords must be flexible harmonized (<HAR>) or VDE (Verbenen Deutscher Elektrotechniker, German Institute of Electrical Engineers) certified cord with 3x 0.75 mm conductors rated 250 VAC.

- » Connector, wall outlet end: Cords must be terminated in grounding-type male plug designed for use in your region. The connector must have certification marks showing certification by an agency acceptable in your region and for U.S. must be listed and rated for 125% of the overall current rating of the server.
- » Connector, server end: The connectors that plug into the AC receptacle on the server must be an approved IEC (International Electrotechnical Commission) 320, sheet C13, type female connector.

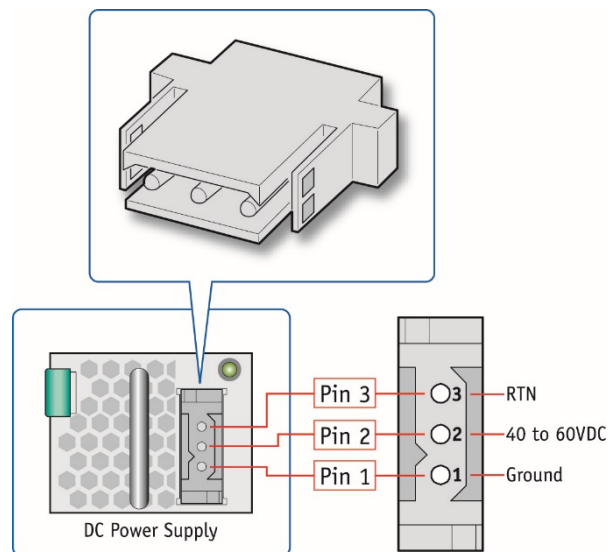
- » Cord length and flexibility: Cords must be less than 4.5 meters (14.8 feet) long.

### 9.2.2 If DC power supplies are installed:

Connection with a DC (Direct Current) source should only be performed by trained service personnel. The server with DC input is to be installed in a Restricted Access Location in accordance with articles 110-26 and 110-27 of the National Electric Code, ANSI/NFPA 70. The DC source must be electrically isolated from any hazardous AC source by double or reinforced insulation. The DC source must be capable of providing up to 1000 watts of continuous power per feed pair.

The input connector on the DC power supply is a 3-pin Positronic. This connector is rated at 32A/pin. An earth ground pin is not required because the system provides two earth ground studs on the rear panel of the chassis. Figure 66 shows the DC input power connector and pin-out.

Figure 66: DC Power Supply Input Connector

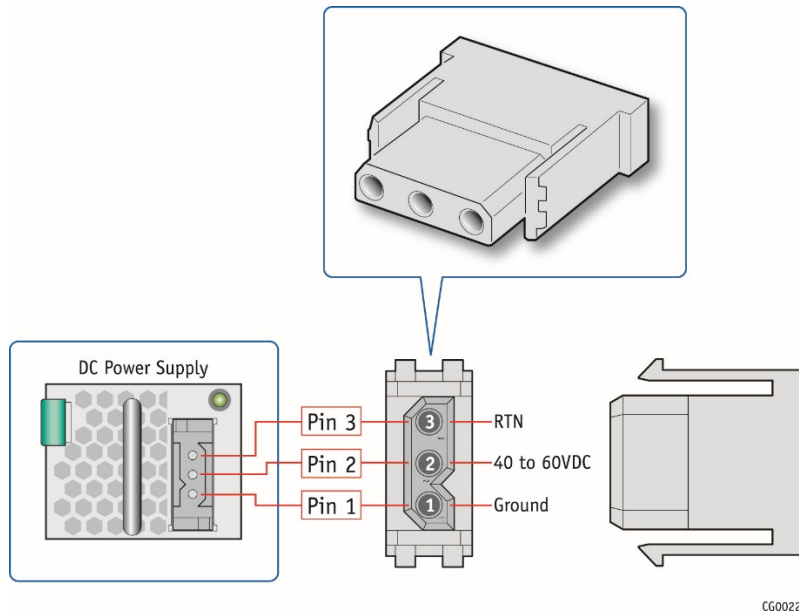


CG00222

### 9.2.3 DC Power Supply Mating Connector

The DC power supply module input mating connector shown in Figure 67 provides the -48V input power connection to the system. The input wiring connections are shown in the table in Figure 67. This mating connector (Positronic PLA03F7050/AA) and three (3) pins (Positronic FC112N2S/AA-15) come delivered with each DC power supply module.

Figure 67: DC Power Supply Mating Connector



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### 9.2.4 DC Power Supply Earth Grounding Studs on Chassis

For instructions about how the safety earth grounding wire is attached to the chassis for use with DC power supplies, see Figure 53, "DC Power Supply Grounding" in Section 5.3.2 "Adding or Replacing a Power Supply Unit".

**Mains DC power disconnect:** You are responsible for installing a properly rated DC power disconnect for the server system. This mains disconnect must be readily accessible, and it must be labeled as controlling power to the server. The UL listed circuit breaker of a centralized DC power system may be used as a disconnect device when easily accessible and shall be rated maximum 35 amps.

**Grounding the server:** This server is intended for installation with an isolated DC return (DC-I per NEBS GR-1089, Issue 3). To avoid the potential for an electrical shock hazard, you must reliably connect an earth grounding conductor to the server. The earth grounding conductor must be a minimum 10 AWG connected to the earth ground stud(s) on the rear of the server. The safety ground conductor should be connected to the chassis stud with a listed closed two-hole crimp terminal having 5/8-inch pitch. The nuts on the chassis earth ground studs should be installed with a 10 in-lbs of torque. The safety ground conductor provides proper grounding only for the server. You must provide additional, proper grounding for the rack and other devices installed in it.

### 9.2.5 Overcurrent protection

Overcurrent protection UL Listed circuit breakers must be provided as part of each host equipment rack and must be incorporated in the field wiring between the DC source and the server. The branch circuit protection shall be rated minimum 75 VDC, 35A maximum per feed pair.


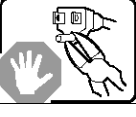
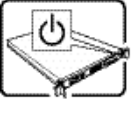


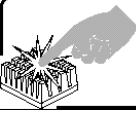

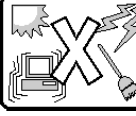
### 9.2.6 Temperature and Ventilation

**CAUTION:** Temperature -- The temperature, in which the server operates when installed in an equipment rack, must not go below 5°C (41°F) or rise above 40°C (104°F). Extreme fluctuations in temperature can cause a variety of problems in the server.

**CAUTION:** Ventilation -- The equipment rack must provide sufficient airflow to the front of the server to maintain proper cooling. The rack must also include ventilation sufficient to exhaust a maximum of 1023 BTUs (British Thermal Units) per hour for the server. The rack selected and the ventilation provided must be suitable to the environment in which the server will be used.

## 9.3 Safety Cautions

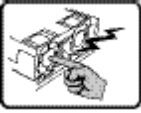
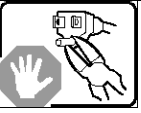
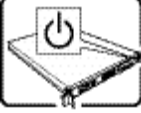

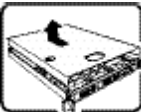
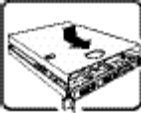
Read all caution and safety statements in this document before performing any of the instructions.

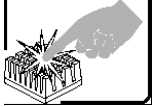

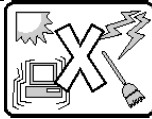
	<p>The power supply in this product contains no user-serviceable parts. There may be more than one supply in this product. Refer servicing only to qualified personnel.</p>
	<p>Do not attempt to modify or use the supplied AC power cord if it is not the exact type required. A product with more than one power supply will have a separate AC power cord for each supply.</p>
	<p>The power button on the system does not turn off system AC power. To remove AC power from the system, always unplug each AC power cord from the wall outlet or power supply.</p> <p>The power cord(s) is considered the disconnect device to the main (AC) power. The socket outlet that the system plugs into must be installed near the equipment and must be easily accessible.</p>
	<p><b>SAFETY STEPS:</b> When removing the chassis covers to access the inside of the system, follow these steps:</p> <ol style="list-style-type: none"> <li>1. Turn off all peripheral devices connected to the system.</li> <li>2. Turn off the system by pressing the power button.</li> <li>3. Unplug all AC power cords from the system or from wall outlets.</li> <li>4. Label and disconnect all cables connected to I/O connectors or ports on the back of the system.</li> <li>5. Provide electrostatic discharge (ESD) protection by wearing an antistatic wrist strap attached to chassis ground of the system—any unpainted metal surface—when handling components.</li> </ol> <p>After completing the six SAFETY STEPS above, you can remove the system covers. To do this:</p> <ol style="list-style-type: none"> <li>1. Unlock and remove the padlock from the back of the system if a padlock has been installed.</li> <li>2. Remove and save all screws from the covers.</li> <li>3. Remove the covers.</li> <li>4. Do not operate the system with the chassis covers removed.</li> </ol>
	<p>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:</p> <ol style="list-style-type: none"> <li>1. Check first to make sure no loose tools or parts were left inside the system.</li> <li>2. Check that cables, add-in boards, and other components are properly installed.</li> <li>3. Attach the covers to the chassis with the screws removed earlier, and tighten them firmly.</li> <li>4. Insert and lock the padlock to the system to prevent unauthorized access inside the system.</li> <li>5. Connect all external cables and the AC power cord(s) to the system.</li> </ol>
	<p>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.</p>
	<p>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.</p>
	<p>The system is designed to operate in a typical office environment. Choose a site that is:</p> <ul style="list-style-type: none"> <li>» Clean and free of airborne particles (other than normal room dust).</li> <li>Well ventilated and away from sources of heat including direct sunlight.</li> <li>» Away from sources of vibration or physical shock.</li> </ul>

	<ul style="list-style-type: none"> <li>» Isolated from strong electromagnetic fields produced by electrical devices.</li> <li>» In regions that are susceptible to electrical storms, we recommend plugging the system into a surge suppressor and disconnecting telecommunication lines to the modem during an electrical storm.</li> <li>» Provided with a properly grounded wall outlet.</li> <li>» Provided with sufficient space to access the power supply cord(s), because they serve as the product's main power disconnect.</li> </ul>
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### 9.3.1 Wichtige Sicherheitshinweise


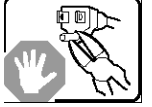
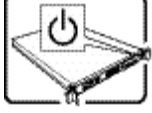
Lesen Sie zunächst sämtliche Warn- und Sicherheitshinweise in diesem Dokument, bevor Sie eine der Anweisungen ausführen.

	Benutzer können am Netzgerät dieses Produkts keine Reparaturen vornehmen. Das Produkt enthält möglicherweise mehrere Netzgeräte. Wartungsarbeiten müssen von qualifizierten Technikern ausgeführt werden.
	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.
	Der Wechselstrom des Systems wird durch den Ein-/Aus-Schalter für Gleichstrom nicht ausgeschaltet. Ziehen Sie jedes Wechselstrom-Netzkabel aus der Steckdose bzw. dem Netzgerät, um den Stromanschluß des Systems zu unterbrechen.
	<p><b>SICHERHEISSMASSNAHMEN:</b> Immer wenn Sie die Gehäuseabdeckung abnehmen um an das Systeminnere zu gelangen, sollten Sie folgende Schritte beachten:</p> <ol style="list-style-type: none"> <li>1. Schalten Sie alle an Ihr System angeschlossenen Peripheriegeräte aus.</li> <li>2. Schalten Sie das System mit dem Hauptschalter aus.</li> <li>3. Ziehen Sie den Stromanschlußstecker Ihres Systems aus der Steckdose.</li> <li>4. Auf der Rückseite des Systems beschriftet und ziehen Sie alle Anschlußkabel von den I/O Anschlüssen oder Ports ab.</li> <li>5. Tragen Sie ein geerdetes Antistatik Gelenkband, um elektrostatische Ladungen (ESD) über blanke Metallstellen bei der Handhabung der Komponenten zu vermeiden.</li> <li>6. Schalten Sie das System niemals ohne ordnungsgemäß montiertes Gehäuse ein.</li> </ol> <p>Nachdem Sie die oben erwähnten ersten sechs SICHERHEITSSCHRITTE durchgeführt haben, können Sie die Abdeckung abnehmen, indem Sie:</p> <ol style="list-style-type: none"> <li>1. Öffnen und entfernen Sie die Verschlusseinrichtung (Padlock) auf der Rückseite des Systems, falls eine Verschlusseinrichtung installiert ist.</li> <li>2. Entfernen Sie alle Schrauben der Gehäuseabdeckung.</li> <li>3. Nehmen Sie die Abdeckung ab.</li> </ol>
	
	<p>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:</p> <ol style="list-style-type: none"> <li>1. Vergewissern Sie sich, daß Sie keine Werkzeuge oder Teile im Innern des Systems zurückgelassen haben.</li> </ol>

	<p>2. Überprüfen Sie alle Kabel, Zusatzkarten und andere Komponenten auf ordnungsgemäßen Sitz und Installation.</p> <p>3. Bringen Sie die Abdeckungen wieder am Gehäuse an, indem Sie die zuvor gelösten Schrauben wieder anbringen. Ziehen Sie diese gut an.</p> <p>4. Bringen Sie die Verschlusseinrichtung (Padlock) wieder an und schließen Sie diese, um ein unerlaubtes Öffnen des Systems zu verhindern.</p> <p>5. Schließen Sie alle externen Kabel und den AC Stromanschlußstecker Ihres Systems wieder an.</p>
	<p>Der Mikroprozessor und der Kühler sind möglicherweise erhitzt, wenn das System in Betrieb ist. Außerdem können einige Platinen und Gehäuseteile scharfe Spitzen und Kanten aufweisen. Arbeiten an Platinen und Gehäuse sollten vorsichtig ausgeführt werden. Sie sollten Schutzhandschuhe tragen.</p>
	<p>Bei falschem Einsetzen einer neuen Batterie besteht Explosionsgefahr. Die Batterie darf nur durch denselben oder einen entsprechenden, vom Hersteller empfohlenen Batterietyp ersetzt werden. Entsorgen Sie verbrauchte Batterien den Anweisungen des Herstellers entsprechend.</p>
	<p>Das System wurde für den Betrieb in einer normalen Büroumgebung entwickelt. Der Standort sollte:</p> <ul style="list-style-type: none"> <li>• sauber und staubfrei sein (Hausstaub ausgenommen);</li> <li>• gut gelüftet und keinen Heizquellen ausgesetzt sein (einschließlich direkter Sonneneinstrahlung);</li> <li>• keinen Erschütterungen ausgesetzt sein;</li> <li>• keine starken, von elektrischen Geräten erzeugten elektromagnetischen Felder aufweisen;</li> <li>• 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;</li> <li>• mit einer geerdeten Wechselstromsteckdose ausgerüstet sein;</li> <li>• über ausreichend Platz verfügen, um Zugang zu den Netzkabeln zu gewährleisten, da der Stromanschluß des Produkts hauptsächlich über die Kabel unterbrochen wird.</li> </ul>

### 9.3.2 Consignes de sécurité

Lisez attention toutes les consignes de sécurité et les mises en garde indiquées dans ce document avant de suivre toute instruction.

	<p>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.</p>
	<p>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.</p>
	<p>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.</p>

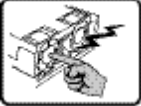
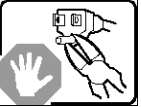
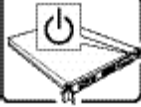




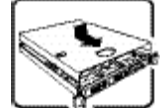





	<ul style="list-style-type: none"> <li>» Dans les régions sujettes aux orages magnétiques il est recommandé de brancher votre système à un supresseur de surtension, et de débrancher toutes les lignes de télécommunications de votre modem durant un orage.</li> <li>» Muni d'une prise murale correctement mise à la terre.</li> <li>» Suffisamment spacieux pour vous permettre d'accéder aux câbles d'alimentation (ceux-ci étant le seul moyen de mettre le système hors tension).</li> </ul>
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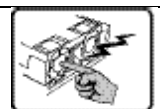

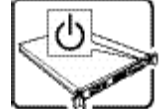
### 9.3.3 Instrucciones de seguridad importantes

Lea todas las declaraciones de seguridad y precaución de este documento antes de realizar cualquiera de las instrucciones.

	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.
	<p><b>INSTRUCCIONES DE SEGURIDAD:</b> Cuando extraiga la tapa del chasis para acceder al interior del sistema, siga las siguientes instrucciones:</p> <ol style="list-style-type: none"> <li>1. Apague todos los dispositivos periféricos conectados al sistema.</li> <li>2. Apague el sistema presionando el interruptor encendido/apagado.</li> <li>3. Desconecte todos los cables de alimentación CA del sistema o de las tomas de corriente alterna.</li> <li>4. Identifique y desconecte todos los cables enchufados a los conectores E/S o a los puertos situados en la parte posterior del sistema.</li> <li>5. Cuando manipule los componentes, es importante protegerse contra la descarga electrostática (ESD). Puede hacerlo si utiliza una muñequera antiestática sujeta a la toma de tierra del chasis - o a cualquier tipo de superficie de metal sin pintar.</li> <li>6. No ponga en marcha el sistema si se han extraído las tapas del chasis.</li> </ol>
	<p>Después de completar las seis instrucciones de SEGURIDAD mencionadas, ya puede extraer las tapas del sistema. Para ello:</p> <ol style="list-style-type: none"> <li>1. Desbloquee y extraiga el bloqueo de seguridad de la parte posterior del sistema, si se ha instalado uno.</li> <li>2. Extraiga y guarde todos los tornillos de las tapas.</li> <li>3. Extraiga las tapas.</li> </ol>
	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:

	<ol style="list-style-type: none"> <li>1. Asegúrese primero de no haber dejado herramientas o componentes sueltos dentro del sistema.</li> <li>2. Compruebe que los cables, las placas adicionales y otros componentes se hayan instalado correctamente.</li> <li>3. Incorpore las tapas al chasis mediante los tornillos extraídos anteriormente, tensándolos firmemente.</li> <li>4. Inserte el bloqueo de seguridad en el sistema y bloquéelo para impedir que pueda accederse al mismo sin autorización.</li> <li>5. Conecte todos los cables externos y los cables de alimentación CA al sistema.</li> </ol>
	<p>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.</p>
	<p>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.</p>
	<p>El sistema está diseñado para funcionar en un entorno de trabajo normal. Escoja un lugar:</p> <ul style="list-style-type: none"> <li>» Limpio y libre de partículas en suspensión (salvo el polvo normal).</li> <li>» Bien ventilado y alejado de fuentes de calor, incluida la luz solar directa.</li> <li>» Alejado de fuentes de vibración.</li> <li>» Aislado de campos electromagnéticos fuertes producidos por dispositivos eléctricos.</li> <li>» 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.</li> <li>» Provisto de una toma de tierra correctamente instalada.</li> <li>» Provisto de espacio suficiente como para acceder a los cables de alimentación, ya que éstos hacen de medio principal de desconexión del sistema.</li> </ul>

## Informazioni di Sicurezza importanti

	<p>Rivolgersi ad un tecnico specializzato per la riparazione dei component dell'alimentazione di questo prodotto. È possibile che il prodotto disponga di più fonti di alimentazione.</p>
	<p>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.</p>
	<p>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.</p>



	<ul style="list-style-type: none"><li>» <b>Dotata di una presa a muro correttamente installata.</b></li><li>» <b>Dotata di spazio sufficiente ad accedere ai cavi di alimentazione, i quali rappresentano il mezzo principale di scollegamento del sistema.</b></li></ul>
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## 10 Appendix B: Regulatory and Certification Information

### 10.1 Product Regulatory Compliance

#### 10.1.1 Product Safety Compliance

The Carrier Grade server complies with the following safety requirements:

- » UL60950-1 / CSA 60950-1 (USA / Canada)
- » EN60950-1 (Europe)
- » IEC60950-1 (International), CB Certificate & Report including all international deviations
- » CU Approvals (EAC Mark) (Armenia, Belarus, Kazakhstan, Kyrgyzstan, Russia)
- » CE - Low Voltage Directive 2006/95/EC (Europe)

#### 10.1.2 Product EMC Compliance - Class A Compliance

The Carrier Grade server has been tested and verified to comply with the following electromagnetic compatibility (EMC) regulations.

- » FCC Part 15 / ICES-003 - Emissions (USA/Canada)
- » CISPR 22 - Emissions (International)
- » CISPR 24 - Immunity (International)
- » EN55022 - Emissions (Europe)
- » EN55024 - Immunity (Europe)
- » EN61000-3-2 - Harmonics (Europe)
- » EN61000-3-3 - Voltage Flicker (Europe)
- » CE- EMC Directive 2004/108/EC (Europe)
- » AS/NZS: CISPR 22 Emissions (Australia / New Zealand)
- » CU Approvals (EAC Mark) (Armenia, Belarus, Kazakhstan, Kyrgyzstan, Russia)
- » KN22 (Korea)
- » KN24 (Korea)

#### 10.1.3 Marking

- » cULus Listed (US/Canada)
- » CE Mark (Europe)
- » RCM Mark (Australia and New Zealand) (replaces C-Tick)
- » EAC Mark (Russia)
- » KCC Mark (Korea)

NOTE: Marks above are found on CG2300 Safety Label (on unit top cover)

#### 10.1.4 Environmental Compliance

- » WEEE
- » REACH

- » RoHS
- » China RoHS

## 10.2 Electromagnetic Compatibility Notices

### 10.2.1 FCC (USA)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For questions related to the EMC performance of this product, contact:

Kontron Canada, Inc.  
4555 Ambroise-Lafortune  
Boisbriand (Québec)  
J7H 0A4  
Canada  
  
(800) 387-4222

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment. The customer is responsible for ensuring compliance of the modified product.

Only peripherals (computer input/output devices, terminals, printers, etc.) that comply with FCC Class A or B limits may be attached to this computer product. Operation with noncompliant peripherals is likely to result in interference to radio and TV reception.

All cables used to connect to peripherals must be shielded and grounded. Operation with cables connected to peripherals that are not shielded and grounded may result in interference to radio and TV reception.

### 10.2.2 Industry Canada (ICES-003)

Cet appareil numérique respecte les limites bruits radioélectriques applicables aux appareils numériques de Classe A prescrites dans la norme sur le matériel brouilleur: "Appareils Numériques", NMB-003 édictée par le Ministre Canadien des Communications.

#### English translation of the notice above:

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the interference-causing equipment standard entitled "Digital Apparatus", ICES-003 of the Canadian Department of Communications.

### 10.2.3 Europe (CE Declaration of Conformity)

This product has been tested in accordance to, and complies with, the Low Voltage Directive (73/23/EEC) and EMC Directive (2004/108/EC). The product has been marked with the CE Mark to illustrate its compliance.

### 10.2.4 VCCI (Japan)

この装置は、クラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

VCCI- A

#### English translation of the notice above:

This is a Class A product based on the standard of the Voluntary Control Council for Interference (VCCI) from Information Technology Equipment. If this is used near a radio or television receiver in a domestic environment, it may cause radio interference.

Install and use the equipment according to the instruction manual.

### 10.2.5 BSMI (Taiwan)

**警告使用者：**  
這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策

The BSMI Certification Marking and EMC warning is located on the outside rear area of the product.

### 10.2.6 Regulated Specified Components

To maintain the UL listing and compliance to other regulatory certifications and/or declarations, the following conditions must be adhered to and the following regulated components must be used. Interchanging or using other components will void the UL listing and other product certifications and approvals.

1. Add-in boards must have a printed wiring board flammability rating of minimum UL94V-1. Add-in boards containing external power connectors and/or lithium batteries must be UL recognized or UL listed. Any add-in board containing modem telecommunication circuitry must be UL listed. In addition, the modem must have the appropriate telecommunications, safety, and EMC approvals for the region in which it is sold.
2. Peripheral Storage Devices must be a UL recognized or UL listed accessory and TUV or VDE licensed. Maximum power rating of any one device is 19 watts. Total server configuration is not to exceed the maximum loading conditions of the power supply.



## 11 Appendix C: NEBS Considerations

**WARNING:** The CG2300 server intra-building Ethernet RJ-45 ports, COM ports, and/or Telco Alarms port are suitable for connection to intra-building or unexposed wiring or cabling only. The intra-building ports of the CG2300 MUST NOT be metallically connected to interfaces that connect to the OSP or its wiring. These interfaces are designed for use as intra-building interfaces only (Type 2 or Type 4 ports as described in GR-1089) and require isolation from the exposed OSP cabling. The addition of Primary Protectors is not sufficient protection in order to connect these interfaces metallically to OSP wiring.

**WARNING:** The CG2300 server intra-building Ethernet RJ-45 ports, COM ports, and/or Telco Alarms port must use shielded intra-building cabling/wiring that is grounded at both ends.

The CG2300 server is suitable for installation in either the Common Bonding Network (CBN) or an Isolated Bonding Network (IBN).

The CG2300 server is suitable for installation in Network Telecommunication Facilities (NTF) and locations where the National Electric Code (NEC) applies, but is not suitable for installation in Outside Plant (OSP) installations.

The Battery Return (BR) for the -48V DC powered CG2300 systems is suitable for installation as either Isolation DC return (DC-I) or Common DC return (DC-C). Where the CG2300 is installed with a common DC return, the ampacity of the conductor connecting the equipment frame to the battery return conductor shall be equal to or greater than 13 amps.

The CG2300 server can be configured with an optional air filter that is installed behind the front bezel.

The air filter material is UAF Quadrafoam (25 PPI), has a thickness of 6.35mm, flammability rating of UL94-HF1, and meets the minimum dust arrestance of 65% (ASHRAE 52.1-1992) per documentation found at <http://www.uaf.com>. The air filter can be purchased directly from Universal Air Filter (UAF) by calling (618) 271-7300 or emailing [uaf@uaf.com](mailto:uaf@uaf.com) and ordering part number K00737-001. When placing an order provide the attached drawing to verify receipt of the proper air filter.

Recommended Air Filter Replacement Schedule: Every 6 months

The CG2300 server is equipped with thermal sensors to monitor the internal temperature of the system. If the air filter gets clogged so that the fans are not able to pull air through the system, the internal temperature will rise causing a MNR and/or MJR telco alarms manager (TAM) LED to be asserted. This active alarm provides an indication that the air filter should be inspected and/or replaced.

## 12 Appendix D: Getting Help

### 12.1 World Wide Web

Technicians and engineers from Kontron and/or its subsidiaries are available for technical support. We are committed to making our product easy to use and will help you use our products in your systems.

Please consult our Web site at <http://www.kontron.com/support-and-services/support/contact-support> for the latest product documentation, utilities, drivers and support contacts.

## Corporate Offices

### Europe, Middle East & Africa

Lise-Meitner-Str. 3-5  
86156 Augsburg

Germany

Tel.: + 49 821 40 860

Fax: + 49 821 40 860 111

[sales@kontron.com](mailto:sales@kontron.com)

### North America

14118 Stowe Drive  
Poway, CA 92064-7147

USA

Tel.: + 1 888 294 4558

Fax: + 1 858 677 0898

[info@us.kontron.com](mailto:info@us.kontron.com)

### Asia Pacific

1~2F, 10 Building, No. 8  
Liangshuihe 2<sup>nd</sup> Street

Beijing 100176, P. R. China

Tel.: + 86 10 63751188

Fax.: + 86 10 83682438

[info@kontron.cn](mailto:info@kontron.cn)